

# **Institutional Environment and Entrepreneurship in India: An Interstate Study**

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**By**

**Gunjan Kumar**

**Roll No- 136141001**

*Department of Humanities and Social Sciences  
Indian Institute of Technology Guwahati  
Guwahati 781039  
India*

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*Dedicated to  
My Family*





Indian Institute of Technology Guwahati  
Department of Humanities and Social Sciences  
Guwahati-781039  
Assam, India

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### **Declaration**

I do hereby; declare that the matter in this thesis entitled “Institutional Environment and Entrepreneurship in India: An Interstate Study”, is the result of investigations carried out by me in the Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, India under the supervision of Prof. Saundarjya Borbora, Professor, Department of Humanities and Social Sciences, IIT Guwahati.

In keeping with the general practice of reporting observations, due acknowledgements have been made whenever the work described is based on the findings of other investigators.

IIT Guwahati  
September, 2017

Gunjan Kumar  
Research Scholar  
Department of Humanities and Social Sciences  
Indian Institute of Technology





Prof. Saundarjya Borbora  
Professor (Economics)

Department of Humanities and Social Sciences  
Indian Institute of Technology  
Guwahati 781039  
Assam, India  
Phone: +91-361-2582562  
E-Mail: [sborbora@iitg.ernet.in](mailto:sborbora@iitg.ernet.in)

### Certificate

This is to certify that the thesis entitled “**Institutional Environment and Entrepreneurship in India: An Interstate Study**”, submitted by Mr. Gunjan Kumar for the degree of Doctor of Philosophy in Economics in the Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, embodies research work carried out under my supervision and guidance. The present thesis, or any part of it, has not been submitted to any other University or Institute for the award of any degree or diploma. He has fulfilled all the requirements according to the rules of the institute for submission of a thesis.

Saundarjya Borbora

Professor,

Department of Humanities and Social Sciences

Indian Institute of Technology Guwahati



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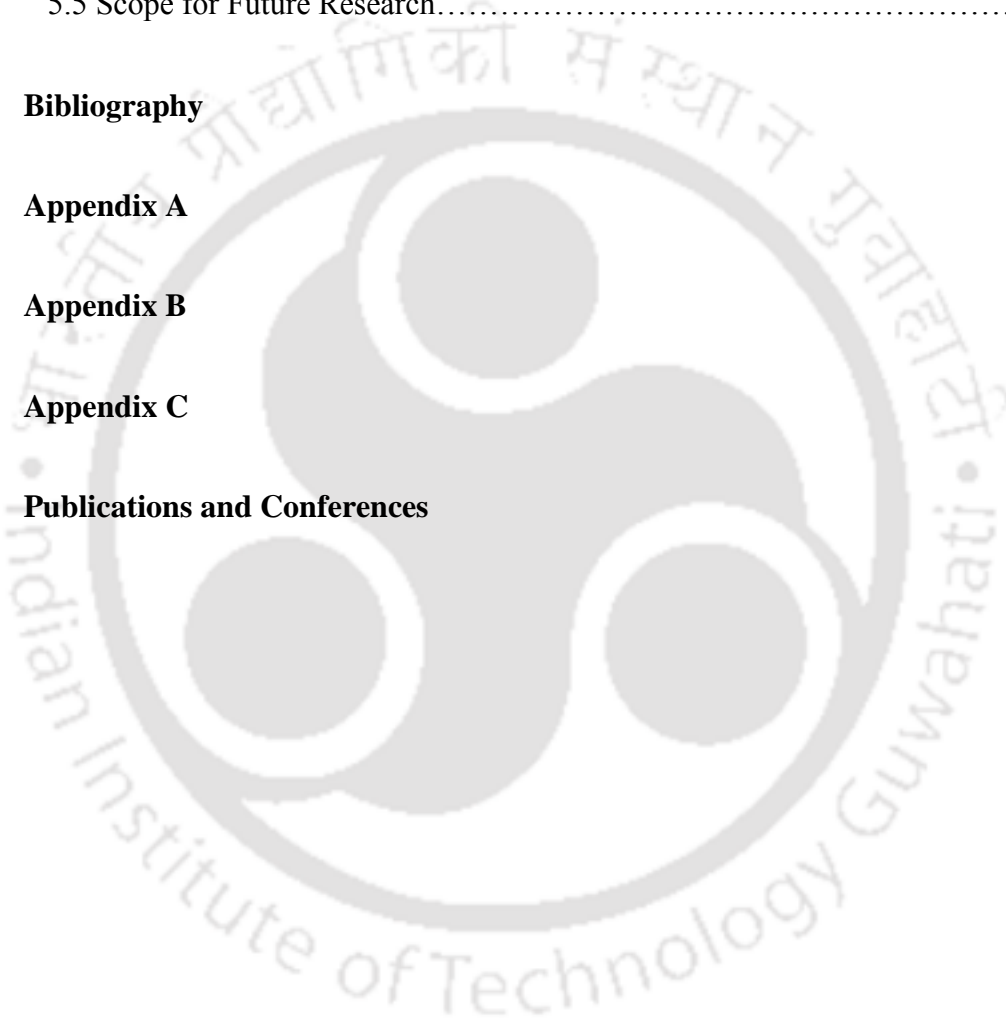
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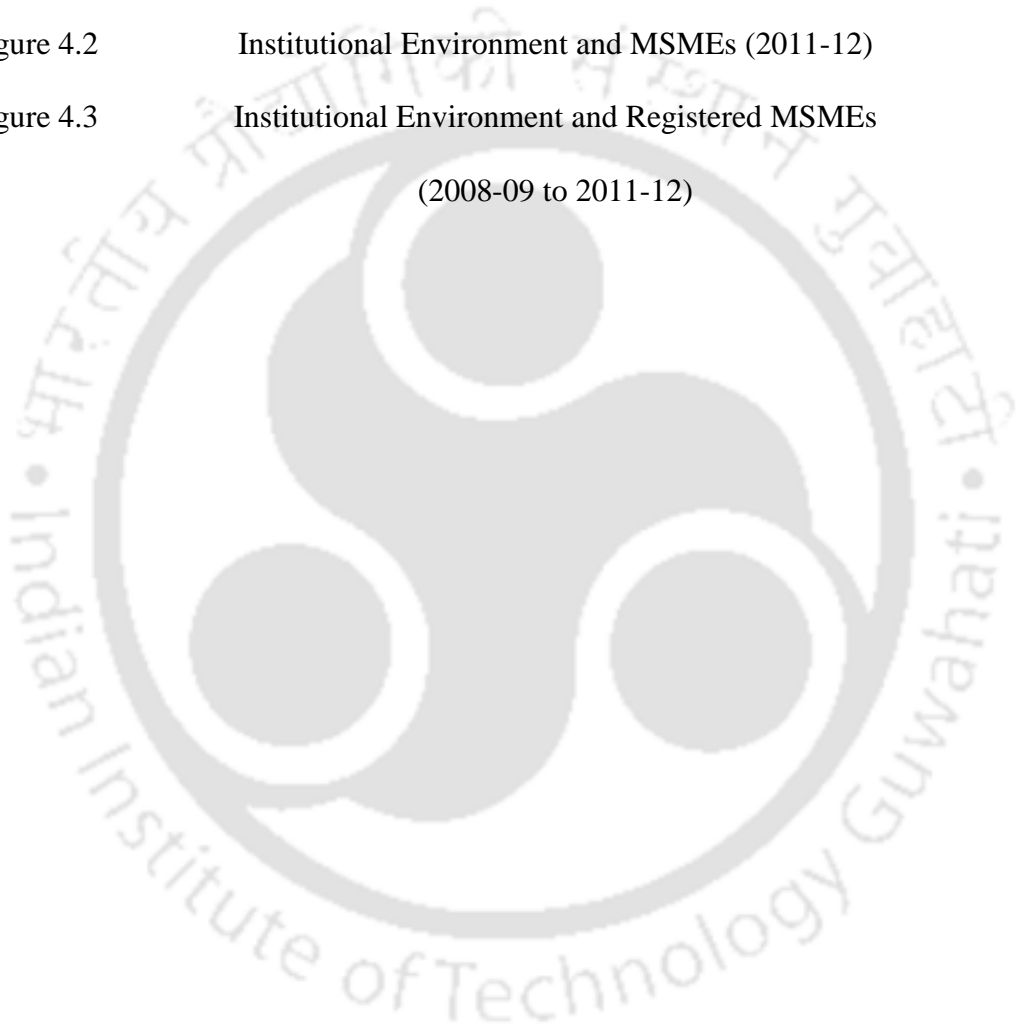
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## Abbreviations

AIC:	Akaike Information Criterion
ASI:	Annual Survey of Industries
BIC:	Bayesian Information Criterion
CD:	Credit-Deposit Ratio
CSO:	Central Statistical Office
EFW:	Economic Freedom of the World
FACS:	Firm Analysis and Competitiveness Survey
FDI:	Foreign Direct Investment
GDP:	Gross Domestic Product
GEDI:	Global Entrepreneurship Development Index
GEM:	Global Entrepreneurship Monitor
GER:	Gross Enrolment Ratio
GERA:	Global Entrepreneurship Research Association
IC:	Investment Climates
IEM:	Industrial Entrepreneurs Memorandum
IPC:	Indian Penal Code
LGBR:	Load Generation Balance Report
MHRD:	Ministry of Human Resource Development
MOSPI:	Ministry of Statistics and Program Implementation
MSMEs:	Micro, Small and Medium Enterprises
NCRB:	National Crime Records Bureau
NEI:	New Institutional Economics
OIE:	Old Institutional Economics

OLS:	Ordinary Least Squares
PCA:	Principal Component Analysis
PFB:	Penalty for Bottleneck
RBI:	Reserve Bank of India
TFP:	Total Factor Productivity
TOC:	Theory of Constraints
TWL:	Theory of weakest link
WEF:	World Economic Forum



## Abstract

The notion that institutions and entrepreneurship are important components of a prosperous society is hardly controversial today. The process of development with the growth of knowledge through institutions and entrepreneurship may be of interest of any country including India. The institutional environment view of entrepreneurship believes that while entrepreneurship is important in all economies, its supply and performances get influenced by the external environment (Institutions). Hence, the study of institutions or institutional environment is considered vital in the field of entrepreneurship as it helps to understand the variation in the relative contribution of entrepreneurship across the regions.

The vast differences in economic growth rates and levels of social and economic development across the Indian states are well studied. But there is a shortage of literature on institutional environment differences across the states of India in the context of entrepreneurship. Therefore, the current thesis focuses on the relation of institutional environments and entrepreneurship in the context of Indian states, having different level of entrepreneurial activity and institutional climate. The research is undertaken with the aim of identifying the relationship between the institutional environment and the two different measures of entrepreneurship (number of factories and number of MSMEs) in case of India.

The current thesis tries to capture the institutional environment of the Indian states through various institutional variables and regional traits. Variables used in the process of identifying the institutional environment differences across the states of India are categorised into three headings: Index of Opportunity, Index of Availability and Index of Security. The index of opportunity is composed of two variables ( $\text{per capita NSDP} \times$

Percentage of Urbanisation) which capture the opportunity perception and market size of a region. The index of availability captures the accessibility of the population to the credit, information and the higher education. Similarly, the index of security measures the safety of lives and property against various physical and economic crimes with the help of various crime rates reported by the National Crime Record Bureau. The index also indicates the legal efficiency differences across the various states of India measured in terms of the pendency of the cases in courts and police as well as the percentage of the recovery of the stolen property. Finally, the index of institutional quality provides a general overview of the institutional environment differences across the states of India.

The study finds significant differences across the states in terms of their institutional environment and these differences among the states in terms of the various determinants of institutional quality collectively create entrepreneurial differences between them. The differences in the institutional environment turn into the variation in the number of enterprises between the states. Various statistical and econometric techniques used for the analysis indicate that the entrepreneurial activities through the means of enterprises (factories and MSMEs) are consistently associated with the institutional environment of the states. The estimated coefficients of the institutional quality scores are significant, whether it is the case of the factories or the case of the registered MSMEs. Statistically speaking, the explanatory power of institutional quality scores regarding entrepreneurial activities is reasonably good as judged by the various tests of significance.

Thus, the differences in institutional quality scores can play a significant role in explaining the variations in the extent of entrepreneurial activities across the Indian states. It can be demonstrated that a larger market size, better legal structure and security environment, as well as better availability of the credit, education, and information together tend to increase entrepreneurship.

# Chapter 1

## Introduction

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### 1.1 Background of the Study

Entrepreneurship has always been considered an important element for the economic development because of its contributions to the national income and job growth. It helps in transforming the ideas and knowledge into action which ultimately contributes to economic growth and employment. Entrepreneurship is so important for the economic performances that it has been conceptualised as the fourth factor of production besides land, labour, and capital. Policymakers always favour its encouragement in the local economies because of its direct linkages to the job growth. Entrepreneurs commercialise the knowledge and thereby bring innovations to the market. Hence, Audretsch et al. (2006) have recognised it as the 'missing link' between investment in new knowledge and economic growth.

Considering its importance, various studies, like those of Leibenstein (1968), Lazear (2005) and Kirzner (2009) have highlighted the individual attributes and capabilities of the entrepreneurs like risk bearing attitude, a capacity of discovering new opportunities and doing more with less, etc. However, the environment in which entrepreneurs can implement their ideas and have incentive to discover and enhance knowledge is equally important for the development of entrepreneurship. Studies like (Acs, Desai and Hessels, 2008; Aidis, Estrin and Mickiewicz, 2009; and Dinh, Mavridis and Nguyen, 2010) have highlighted the importance of the environmental aspect of the entrepreneurship. This environmental view in which the concept and practice of entrepreneurship are enshrined with virtuous status has been considered as a potent act of institutionalisation by Hwang

and Powell (2008) and Coase (1998) has mentioned that studying economics (which of course includes entrepreneurship) without institutions is similar to studying the circulation of blood without a body.

The institutional environment view of entrepreneurship argues that while entrepreneurship is important in all economies, its supply and performances get influenced by the external environment (Institutions). Growth and development of entrepreneurship cannot take place in a vacuum. Entrepreneurs need a favourable institutional framework and a conducive environment in which they can implement their ideas and have incentive to discover and enhance knowledge.

The study of institutions or institutional environment is considered vital in the field of entrepreneurship because it deals with the conditions that entrepreneurs navigate and policymakers need to address. It is natural for the entrepreneurs to ask some questions before implementation of their ideas and establishing enterprises: whether the life and property is safe in the region, do they have adequate control over the returns on their investment and whether they will be able to get sufficient skilled personnel in the region where they are establishing their businesses, etc. Many such questions, which may influence the development of entrepreneurship in a region, are answered by the institutional framework that is prevalent in the concerned regions and their level of implementation. Therefore, McMillan and Woodruff (2002) propose that to explain the lower entrepreneurship level, one should first look towards the weakness of institutions.

Depending on the various institutional environmental conditions, the dynamics of entrepreneurship can be vastly different not only across the nations but also within the nation. Not only the different structure and level of institutional set-up, but the enforcement differences of the same institutional set-up may have a major influence on the quality as well as on the quantity of entrepreneurship. Therefore, the relationship

between institutional environment and entrepreneurship is important to understand why the relative contribution of entrepreneurship varies significantly across the regions. Additionally, an adequate institutional framework and its appropriate implementation enable a region to be capable enough of catching any innovation anywhere rather than engaging in hefty competition. Thus, in studying entrepreneurship within or across nations, the broad nexus between entrepreneurship and institutional environment condition is a critical area of enquiry. The variations in entrepreneurship level between regions can be better understood through the lens of institutions. Institutional view may provide better and deep insight into the problem of entrepreneurship development within or across nations.

## **1.2 Importance of the Study of Institutional Environment and Entrepreneurship in Case of Indian states**

The notion that institutions and entrepreneurship are important components of a prosperous society is hardly controversial today. Entrepreneurs propose; institutions facilitate; markets decide; knowledge grows and development occurs. This process of development with the growth of knowledge through institutions and entrepreneurship may be of interest of any country including India. Policymakers may get a room to build up a favourable environment in which the innovators and knowledge bearers can be attracted. Therefore, this work is intended to study the relation of institutional environments and entrepreneurship in the context of Indian states, having different levels of entrepreneurial activity and institutional climate.

The study of institutional environment is further essential in the context of entrepreneurship for the purpose that policy initiatives adopted through formal laws like subsidies, tax holidays without adequate environment may not be fruitful in the long term. Storey (2008) described these policies of assisting existing enterprises as

“compensatory” in nature for the impediment and inefficient institutional environment in general. For example, even after several special policy initiatives and benefits entrepreneurship could not develop much in north eastern states of India and some poor states like Bihar. Even these initiatives somehow lead to sharp outbreak for some time; it may lose the pace afterward in the lack of complementarities between the various elements of institutions. On the other hand, weakening of institutions may make a state like Jharkhand as a slow growing state, even though it is rich in minerals and natural resources (Debroy & Bhandari, 2014). These are few examples which support the importance of the study of the institutional environment in the context of entrepreneurship in India. The acknowledgment of the weakness of a state on a particular indicator may provide a room for development by improving these constraints rather than simple policy making. After all, there is not a perfect but only a partial substitution that exists among the elements of the system.

### **1.3 Statement of the Problem**

Many studies worldwide have tried to answer the question: which regional institutional factors encourage or constrain entrepreneurship? Most of these studies have compared the countries on the basis of several subjective and objective indicators in relation to answer that question. But the institutional differences within the country are equally important, especially in a country like India, where State governments have a larger role and control in the implementation of many institutions related variables like law and order, justice, local governance, etc.

Moreover, the vast differences in economic growth rates and levels of social and economic development across the Indian states are well studied. But, there is a shortage of literature on institutional environment differences across the states of India. There are some previous studies based on questionnaire responses and therefore are subjective and

perception based. Subramanian (2007) asserts that the perception based measures have at least one problem, that they are subjective and vague. In addition, perception based data also have a problem regarding comparability across states or regions due to different interpretations of survey response (Godin, Clemens and Veldhuis, 2008).

There has been some attempt to use objective measures of institutions in the studies like that of Dash and Raja (2009). Dash and Raja (2009) have treated the security of property rights, index of legal efficiency, and rule of law separately which may have some problems. These institutional indicators are of overlapping nature and one cannot be dissociated from others. For example, the rule of law is itself related to the sense of protection of property rights and refers to the protection of lives and property against violence, theft, and fraud. Moreover, the rule of law is enforced with the help of legal structure or judiciary. These specific and separate variables are meaningful collectively rather than individually.

The study of Debroy and Bhandari (2014) 'The State of Economic Freedom in India 2013' is richer in its content and has used various reasonable proxies while measuring the institutional indicators of economic freedom. However, this study limits itself to the three broad areas: (a) Size of the government, (b) Legal structure and (c) Regulations of labour and business. Thus, many institutional prerequisites or determinants such as market size, education, information availability and credit accessibility could not get much attention, which are important context specific variables of entrepreneurship. The availability and quality of these variables may determine the opportunities available to entrepreneurship. They need to be considered while dealing with institutional quality differences across the states as they may have some important role in shaping the overall environment for entrepreneurs. The inclusion of these factors, along with primary institutions of property rights and rule of law may present a broader and better picture of

institutional quality differences across the states at least in the context of entrepreneurship. Therefore, the present study attempts to include these variables while measuring the institutional environment differences across the states of India.

In the context of the relationship between institutions and entrepreneurship, there are few studies (Indicus Analytics, 2004; Veeramani and Goldar, 2005; National Knowledge Commission, 2008; Dash and Raja, 2009) in India and many of them are concentrated on established enterprises and big business houses and used their perceptions to define institutional quality of states. Big enterprises tend to develop their own institutional environment as an adjustment strategy to the regional economic system. They are capable enough to create certain local micro-system backing up their investment (Zvirgzde, Schillerand Diez, 2013). Zvirgzde et al. (2013) argue that one cannot dismiss the possibility of creating an own institutional environment by big business enterprises on the basis of the government preferential treatment. This preferential treatment of certain established sector or enterprises has been expressed as an exclusive policy by Storey (2008) with a negative impact on other businesses. Moreover, because of their strong capital base, big enterprises are capable enough to shift their businesses anywhere around the world where they get favourable environment, which is comparatively less possible for small and medium businesses. Therefore, big business houses and corporations are less dependent on institutional environment, at least locally. These big business enterprises are also not evenly scattered across the states and are concentrated on few states or regions.

However, entrepreneurial activities in the form of Micro, Small and Medium Enterprises (MSMEs) are also quite significant in low income developing countries. These small and medium sized enterprises are more dependent on the enforcement of regional institutions for their performances. Bala Subrahmanya (2004) mentions the Reserve Bank of India

(RBI), 2003 statement that small firms are largely dependent on bank credit to meet their financing requirements, while larger firms have alternative sources of finance. Unlike large firms, MSMEs in India are also not yet attractive to equity markets or to Foreign Direct Investment (FDI) (Honorati and Mengistae, 2007). Therefore, MSMEs need to be studied separately. Small business enterprises have also been cited as the second best link for measuring entrepreneurship for job creation in the academic literature.

Small business enterprises along with the big corporations may give a better insight of entrepreneurship at least in developing countries like India across the states. They seem to be more dependent on local institutional environment condition. Therefore, to understand the dynamic relationship between the institutions and entrepreneurship, MSMEs are also studied separately along with the factories to deal across the states. Both the factories and the MSMEs may show different responses and relations to the institutional environment conditions. Therefore, both the variables have been used in the present study.

This study is focused on institutional variables that are important for entrepreneurship and uses number of factories and MSMEs as representative of entrepreneurship. It attempts to include the possible variables to explain the institutional quality differences across the states of India and focuses on the general environment rather than at establishment or firm level. The present study hopes to contribute in understanding the phenomenon why the relative contribution of entrepreneurship varies across the states/regions. It tries to fill the gap of research which hampers the effectiveness of policy efforts to promote job growth through entrepreneurship development in India. Thus, the difference of institutional quality/environment and its relationship with entrepreneurship across the Indian states is the critical area of enquiry of this study.

## 1.4 Objectives of the Study

The study has been taken up with the following two objectives:

1. To have an overview of the institutional environment differences across the states of India in the context of entrepreneurship.
2. To examine the relationship between the quality of institutions and the entrepreneurship in India across its states.

## 1.5 Research Questions

Following research questions are formulated for the accomplishment of the first objective:

- What are the important regional differences in the quality of institutions across the states of India in the context of entrepreneurship?
- Are there imbalances within the states, among the various areas related to institutions?

Research questions formulated for the accomplishment of the second objective are as follows:

- Is there any significant relationship between the regional level of institutions and the entrepreneurship?
- Can the differences in entrepreneurship development across the various states of India be explained through the institutional quality scores?

## 1.6 Data Sources and Methodology

The present study has been based on secondary data. Since, there is no systematic data collection of institution related variables; the study has to rely on various sources (Planning Commission of India; Census of India; National Crime Records Bureau (NCRB); Ministry of Statistics and Program Implementation (MOSPI); Ministry of

Human Resource Development (MHRD), Reserve Bank of India (RBI), Annual Survey of Industries, Ministry of MSMEs, IndiaStat.Com - India's Comprehensive Statistical Analysis ...[www.indiastat.com](http://www.indiastat.com). etc. for the collection of data.

The effectiveness of any institutional set-up is determined by the actions of several complementary elements and there is a need of coherence among all related variables to deliver a unified and mutually reinforcing environment. Hence, Kunčič (2014) has recommended a composite indicator which combines the information of several empirical measures as a better solution. Acs and Szerb (2010) also argued that though there are methodologies and econometric techniques such as Principal Component Analysis (PCA) and Instrumental Variable analysis to merge together the indicators and determine the appropriate weight, but may have a problem of negation of potential differences across the states, regions or countries. Therefore, like many studies (Global Entrepreneurship Monitor (GEM); Economic Freedom of the World (EFW); Global Entrepreneurship Development Index (GEDI); Doing Business Index), this study also uses a composite index method to compare the environmental aspects of entrepreneurship. Two different methods (Simple Average Method and Penalty for Bottleneck Methodology) have been used in the construction of the composite index of the institutional quality/environment.

Two different proxies used regarding the measurement of entrepreneurship are: number of factories per million population and number of registered MSMEs per million populations.

In Order to examine the relationship between the institutional environment and the entrepreneurship appropriate statistical and econometric techniques such as Pearson's correlation, Spearman's rank correlation, Ordinary Least Square Regression, Bootstrap

Linear Regression and Panel regressions have been used. The detailed sources of Data and the Methodology used have been spelled out in the respective chapters.

### **1.7 Layout of the Dissertation**

The dissertation is comprised of five chapters, including the introduction.

The second chapter is the review of literature on various theoretical and empirical issues related to institutions and entrepreneurship. It also describes various variables or regional traits which may encourage local entrepreneurship of a region.

The third chapter describes the institutional environment differences across the various states of India. It also depicts the imbalances among the various indicators across the states.

The fourth chapter deals with the relationship between the institutional environment and the various measures of the entrepreneurship.

The concluding chapter of the dissertation presents a recapitulation of the major findings, conclusions emerging from the study, a discussion of the policy implications and scope for the future study.

## Chapter 2

# Review of Literature

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The review of literature is an important part of any scientific investigation. It provides information on the existing knowledge in the domain, which always helps a researcher in the formulation of any research problem. It enables a deep understanding and a broader prospective on the basis of which a research may progress in the right direction. Review of literature has an immense contribution in the development of a study and any study is incomplete without it. Therefore, the possible literatures have been reviewed under the following headings in this study:

2.1 Entrepreneurship: Definitions and Importance

2.2 Entrepreneurship in the Empirical Context

2.3 Institutions: Meaning and Significance

2.4 Role of Institutions in the Entrepreneurship

2.5 Institutional Variables and Regional Traits

2.6 Role of Infrastructure

2.7 Role of Business Incubation Centres

2.8 Case of India

2.9 Studies in Indian Context

## 2.1 Entrepreneurship: Definitions and Importance

### 2.1.1 Definitions

The concept of entrepreneurship was always there in the society, but the term “entrepreneur” first appeared in the literature in 1253, when it was used in different forms (e.g. ‘empreneur’) and after that it was commonly used in 1500 and 1600s (Filion, 2011). Filion (2011) mentioned the famous work of the Richard Cantillon ‘Essay on the Nature of Commerce in General (1755)’ describing the entrepreneur as a person who purchases a raw material at a known price and sell it at an unknown price. From the definition of Cantillon at least two dimensions can be extracted of entrepreneurship, first the investment by purchasing raw material and second the risk of selling at an unknown price. After Cantillon, Jean-Baptiste Say regarded entrepreneurs as being people who could do new things, people who could do more with less, and people who would obtain more by doing something in a new or different way (as cited in Filion, 2011).

The pioneer of the entrepreneurship, Schumpeter coined the word ‘*unternehmergeist*’ German for entrepreneurial spirit, acknowledging “*fiery souls*” or “*wild spirits*”. He believed that entrepreneurs are the individuals who make ideas workable in the economy and can challenge the established ways of doing things. Schumpeter in his classic treatise ‘*Theorie der wirtschaftlichen Entwicklungen* (Theory of economic development, 1911)’ mentioned the concept of “creative destruction” related to the contribution of innovation by entrepreneurs (Audretsch, Keilbach and Lehman, 2006; Ripsas, 1998; Filion, 2011). He described five types of innovative activities by entrepreneurs as the entrepreneurial function involving the (a) New Products, (b) New Methods of Production, (c) New Sources of Supply, (d) New Markets and (e) New Ways to Organise (Hwang and Powell, 2008). For Schumpeter an entrepreneur need not to be an inventor, he can innovate even within the available conditions by recombination. He argued that the inventor produces

ideas, but the entrepreneur “gets thing done” (as cited in Godin, Clemens and Veldhuis, 2008).

Similar to Schumpeter’s view Kirzner, a representative of Austrian tradition described the entrepreneur as ‘alert discoverer’ or discoverer of new opportunities; who, unlike all other participants, are not mere price takers but are capable of price and quality making. “*The entrepreneur who dominated my 1973 work did not need to be creative at all; He simply had to be alert to price differentials which others had not yet noticed*” (Kirzner, 2009). According to Kirzner an entrepreneur is an arbitrageur; a middleman who recombines productive activities to produce more valuable outputs and/or use cheaper inputs in order to squeeze out those arbitrage-profit opportunities which he has noticed as an alert discoverer (Kirzner, 2009; Ripsas, 1998; Fogel, Hawk, Morck and Yeung, 2008). Thus, profit winning behaviour of entrepreneurs is a creativity that embraces alertness too. Following Mises and Hayek, Kirzner (1997) has also highlighted the decision making capacity of entrepreneurs and their perception of profit opportunities as market-imbalance equilibrating function.

The concept of uncertainty and the entrepreneur as the risk bearer became the focus of Knight and Chicago school in the field of entrepreneurship. Even Schumpeter noted that the capitalist function and the entrepreneurial function often overlap in reality, and thus entrepreneurs often become a bearer of risk in their role as capitalist. Adaptive and speculative functions of entrepreneurs are highlighted by Von Mises, Schumpeter, Knight and many others (Godin, Clemens and Veldhuis, 2008; Kirzner, 2009).

Casson (1982) made an addition by stressing the role of the entrepreneur as coordinator who tries to integrate entrepreneurial decisions making (as cited in Ripsas, 1998).

Leibenstein (1968) has given the definition of entrepreneur as an individual or group of individuals with four major characteristics: he connects different markets, he is capable

of making up for market deficiencies (gap-filling), he is an “input completer” and he creates or expands time binding, input-transforming entities (i.e. firms).

Combining many of these definitions, Filion (2011) expressed: an entrepreneur is an actor who innovates by recognising opportunities; he or she makes moderately risky decisions that lead into actions requiring the efficient use of resources and contributing an added value. While there are many definitions available for entrepreneurs, Baumol’s notion regarding entrepreneurship are that the subject is conceptually elusive and the term has not always had clear theoretical content (Leff, 1979). Therefore, defining entrepreneurship is difficult and lack agreements among economists as it has various dimensions. That would be a probable reason that the term entrepreneur and entrepreneurship is used interchangeably in the literature and one may find many definitions of entrepreneurship depending on the context of studies of various authors.

While a generally accepted definition is lacking, there is agreement that the concept comprises numerous dimensions like unique traits, risk taking, opportunity recognition, coordination, recombination, motivation and exploitation and innovation. All the aspects whether Schumpeterian creativity, Kirzner’s alertness and arbitrage contexts or Knight’s uncertainty-bearing are part of entrepreneurial activity. Lazear (2005) made a statement in relevance that entrepreneurs perform many functions and therefore must be a generalist “Jacks of all Trades” who need not excel in any one skill. He described entrepreneurship as the process of assembling necessary factors of production consisting of human, physical and information resources and doing so in an efficient manner. All the attributes of entrepreneurs’ and the activities pursued by them may be considered as entrepreneurship. Entrepreneurship and entrepreneurs cannot be dissociated from each other.

### **2.1.2 Importance of the Entrepreneurship**

Traditionally, economists stress on increasing productivity to overcome the problem of diminishing returns. Initially, it was supposed to be achieved through the accumulation of physical capital and the division of labour by specialisation. Later new growth theorists like Romer and Lucas have recognised knowledge as an essential driver of economic growth. The mandate for entrepreneurship policy has emerged from the failure of the traditional policy, corresponding to the Solow model or those based on instruments promoting investment in physical capital and from the failure of the new policy instruments, corresponding to the Romer model or those promoting investment into knowledge capital through education and research and development (Audretsch et al., 2006). For the advocates of entrepreneurship the source of productivity enhancement lies in the increase of knowledge which entrepreneurial activity generates and exploits the same for profit and growth.

Though there was a direct production of knowledge or important inventions made in some economies, there was little effort to imitating and implementing the ideas (Schmitz, 1989). For example, early China and Sweden are believed to have such experiences. Sweden and many other European countries with high level of investment in research and development and human capital had stagnant growth rates and were sluggish throughout the 1990s and into the new century (Audretsch et al., 2006). This empirical experience of failure of investment in new knowledge has recognised entrepreneurship and/or small firms essential for economic growth. Entrepreneurship takes on adequate importance in today's knowledge economy because it serves as a key mechanism by which ideas or knowledge are transformed into the action contributing to economic growth and employment. Audretsch et al. (2006) have recognised it as the 'missing link' between investment in new knowledge and economic growth. Moreover, they advocate

that rather than imposing an efficiency burden on the economy as seemingly was the case in the Solow economy, entrepreneurship serves as an engine of growth by providing a vital conduit for the spill over and commercialisation of knowledge and new ideas. Even the Schumpeter's metaphor of "creative destruction" is embedded in the basic process of entrepreneurship fuelling economic growth.

In case of developing countries, Leff (1979) considered entrepreneurship essential for investment, innovation and structural changes if economic development is to be achieved in the underdeveloped countries. He identified a key function of entrepreneurship in developing countries is to mobilise factors such as capital and specialised labour which are imperfectly marketed. Therefore, entrepreneurship also acts as a channel for inputs supply and sale of outputs in the process of economic development. It has come to be well recognised now that an economy's prosperity depends greatly on a dynamic entrepreneurship sector and the difference of entrepreneurial opportunities and activities is one important factor determining the varying levels of wealth and prosperity across regions and countries (GERA, 2011; Boettke & Coyne, 2009).

## **2.2 Entrepreneurship in the Empirical Context**

### **2.2.1 Measuring Entrepreneurship**

Entrepreneurship as a concept cannot actually be directly measured. Moreover, it can be envisaged either in the latent form as related to the personality traits (conceiving entrepreneurship) or in the overt form as performing entrepreneurship. While the former is largely unobservable and not considered as a reliable instrument, the latter can be used as a measure. Therefore, entrepreneurship researcher started to focus more on what the entrepreneurs do rather than what their character traits are (Ligthelm, 2010).

There is no consensus on how entrepreneurship should be defined and measured in empirical research (Henrekson and Sanandaji, 2014). Economists have been struggling to find appropriate measures of entrepreneurship and the academic literature has used several different measures of entrepreneurship like sole proprietorship, number of private enterprises, net business formation etc. (Hall & Sobel, 2008). Therefore, current measures of entrepreneurship are highly scattered and thus fails to provide a readily available and easy to understand tool for comparing entrepreneurship across regions (Godin, Clemens and Veldhuis, 2008; Henrekson and Sanandaji, 2014). Nevertheless, the most common indicator of entrepreneurship tends to be the number of established enterprises, as the purposeful action in establishing firms or enterprises is at the heart of entrepreneurship. But it is a static view of entrepreneurship as the number of enterprises within a region or state is a stock variable (Nystrom, 2008). It reflects past economic activity as well as current conditions; therefore, it may either understate or overstate the entrepreneurial activities of a region (Hall & Sobel, 2008). But, a major advantage of using number of enterprises is that it is measured and can be compared across the states or regions and over time. Therefore, the rate of entrepreneurship is commonly proxied using quantity based metrics such as small business activity, self-employment rate, or the number of start-ups (Henrekson and Sanandaji, 2014).

However, entrepreneurship can be performed in several forms (formal or informal) and through various means (Big, Small or Medium enterprises). It can occur in small start-up businesses as well as in large existing firms (Godin, Clemens and Veldhuis, 2008). Therefore, the question remains to answer is that which proxy should be used. One probable solution would be to use all the proxies: formal/informal or big/small enterprises. However, the dynamics of necessity/opportunity entrepreneurship are closely connected to the informal/formal status. Most of the necessities driven entrepreneurship

in developing countries are in the informal sector (Desai, 2009). Therefore, the disadvantages of using informal entrepreneurship/businesses as a measure of entrepreneurship are that it may not be necessarily driven by entrepreneurial activity rather by necessity or by demographic factors like huge population and unemployment (Godin, Clemens and Veldhuis, 2008). It is also conceivable that necessity-based entrepreneurs start out as self-employed and are less likely to register themselves. Instead, opportunity based entrepreneurs are much more likely to register as a limited enterprise (De Kok, Deijb and Essen, 2013). One practical difficulty also in using informal measure is regarding its measurement and availability of related data. Quantitative data on the number of enterprises in the informal sector is hardly available. Whatever data are available regarding the informal sector are either in the form of employment in this sector (Number of workers employed in the informal sector) or in the form of a share of this sector in GDP. Thus, the implication for measuring entrepreneurship is through formal and registered enterprises.

### **2.2.2 Micro, Small and Medium Enterprises (MSMEs) and Its Importance**

Recent studies stress on small business counts as a second best link for measuring entrepreneurship (Ghani, Kerr and Conell, 2011). Medium and Small businesses are one of the vehicles through which entrepreneurs bring innovations to the market. Small and micro businesses are of course not synonymous with entrepreneurship, but Centre for Development and Enterprise (2004) finds entrepreneurship in its strongest and purest form at the level of small and medium sized enterprises, where individuals' self-reliance and risk-taking are particularly prominent (as cited in Ligthelm, 2010).

Micro, Small and Medium enterprise sector is believed to be a dynamic and vibrant sector which nurtures entrepreneurial talent. In a large review of empirical research on entrepreneurship, Simon Parker (2005) found that small firms have above average rates

of innovation-that is, in relation to all other size of firms (as cited in Godin, Clemens and Veldhuis, 2008). An implicit assumption appears to be that countries or regions with a large number of small firms also tend to be those where most innovative high-growth firms emerge (Henrekson and Sanandji, 2014).

Small firms are also considered as an effective engine for economic growth and job creation as they account for the majority of employment in all sectors of today's developing countries (Rupasingha, 2013; Hansson, 2012; Ligthelm, 2010; Gollin, 2000). Kok, Deijl and Essen (2013) found that in terms of employment levels, the SME size class is the dominant size class in countries across the world. Enterprises from MSMEs class employ more people than large enterprises in most of the developing and emerging economies. The long term contribution of SMEs not only includes the direct job creation, but also spill-over effects that occur due to increased competition and innovation (Kok, Deijl and Essen, 2013). MSMEs don't require much capital to start with and are expected to facilitate financial inclusion. They tend to use local resources and provide employment opportunities to local people (Biswas, 2015). They are highly labour-intensive and useful in promoting balanced regional industrial development (Bala Subrahmanya, 1998). Moreover, in recent years the service sector has expanded significantly and service firms are smaller on average and provide more opportunities for entrepreneurship (Acs, Desai and Hessels, 2008). Ligthelm (2010) argued that the growth of the service sector opened up opportunities that can at best be utilised by small businesses.

### **2.2.3 Micro, Small and Medium Enterprises (MSMEs) in India**

Small enterprises have been one of the major planks of India's industrial and development policies since independence. According to the report of the working group on MSMEs growth for 12<sup>th</sup> Five Year Plan (2012-17) of the Ministry of Micro, Small

and Medium Enterprises, it is estimated that in terms of value, the MSME sector accounts for about 45 percent of the manufacturing output and 40 percent of total exports of the country. They provide the largest share of employment after agriculture. Another noteworthy feature of MSME sector in India is that it is widely dispersed across the country which makes this sector important for regional development. About 45.2 percent of the MSMEs are located in rural areas (Sinha, 2012).

Initially, the government of India adopted the protective policies for the development of this sector, which comprises policies such as concessional finance, fiscal incentives, price preferences, reservation of small scale industrial products for exclusive government purchase and the reservation of items for exclusive manufacturing in small scale industrial (SSI) sector etc. (Bala Subrahmanya, 1998). This policy of protection and reservation continued for a long time. The reservation list included 836 items in 1988 for exclusive manufacturing by SSI sector and 409 products were reserved for exclusive government purchase (Bala Subrahmanya, 1998).

With the introduction of reform measures and policy changes at the national and global level since 1991, the environment for the functioning of these small enterprises has changed significantly. The government of India has started curtailing of many protective policies for the MSMEs. The number of items reserved exclusively for small industrial manufacturing has been gradually brought down from 842 in 1991 to 675 in 2003 (Bala Subrahmanya, 2004). As of 30th July 2010, there remained only 20 items reserved exclusively for manufacture by micro and small enterprise sector. Recently the Ministry of Commerce and Industry of the government of India has completely delisted the items reserved for exclusive manufacture in small scale sector on 10th April, 2015.

The new reform policy with economic liberalisation and globalisation has nullified the protection that had been enjoyed by this sector and unfolded this sector for a competition. The policy has shifted from the protections to promotions. The government has started strengthening of development measures rather than protective measures for the development of this sector. The emphasis has shifted from subsidised credit to ensuring an adequate flow of credit to the SSI. A premier financial institution Small Industries Development Bank of India (SIDBI) has been set up as a part of this policy (Bala Subrahmanya, 1998). To overcome the infrastructural deficiencies faced by this sector the government introduced Integrated Infrastructural Development Scheme (IID) in the states in the year 1994. Similarly an Integrated Technology Up gradation and Management programme (UPTECH) has been launched in 1998 to provide technology infrastructure and transfer to the MSME sector. As a part of this policy Small Industries Development Organisation (SIDO) and Small Industries Service Institutes (SISIs) have been set up by the government.

The Micro, Small and Medium Enterprises Development (MSMED) act 2006 is one of the crucial steps by the government to provide for promotion and development of MSMEs with enhancing competitiveness among them. It has defined clearly the units that fall under micro, small and medium category. Additionally, this act has classified and defined the service sector separately, significance of which in MSME sector has been increasing in recent decades. According to the MSMED Act 2006, in the case of enterprises engaged in the manufacture or production of goods:

- i. A Micro enterprise is an enterprise where the investment in plant and machinery does not exceed twenty-five Lakhs (2.5 Million) rupees.

- ii. A Small enterprise is one where the investment in plant and machinery is more than 25 Lakhs (2.5 Million) rupees but does not exceed five Crores (50 million) rupees.
- iii. A Medium enterprise is an enterprise where the investment in plant and machinery is more than five Crores (50 million) rupees but does not exceed ten Crores (100 million) rupees.

In case of the enterprises engaged in providing or rendering services:

- i. A Micro enterprise is an enterprise where the investment in equipments does not exceed ten Lakhs (1 Million) rupees.
- ii. A Small enterprise is one where the investment in equipments is more than 10 Lakhs (1 Million) rupees but does not exceed two Crores (20 Million) rupees.
- iii. A Medium enterprise is an enterprise where the investment in equipments is more than two Crores (20 million) rupees but does not exceed five Crores (50 million) rupees.

All these investment limits excludes the cost of pollution control, R&D, industrial safety devices and other such items (MSMED Act, 2006).

The Ministry of Micro, Small and Medium Enterprises of the Government of India conduct a time to time census of the MSMEs in India and provide statistics related to them.

#### **2.2.4 Factories in India**

Another important way for the enterprises to enter into the formal entrepreneurship in India is in the form of registered factories. According to the Factories Act, 1948 (Act

No.63) as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987), “Factory” means any premises including the precincts thereof-

- (i) Whereon ten or more workers are working or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power, or is ordinarily so carried on, or
- (ii) Whereon twenty or more workers are working or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on, but does not include a mine subject to the operation of the Mines Act, 1952 (XXXV of 1952) or a mobile unit belonging to the armed forces of the Union, a railway running shed or a hotel, restaurant or eating place.

Annual Survey of Industries covers all factories registered under section 2m (i) and 2m (ii) of the Factories Act, 1948 and is the principal source of industrial statistics in India. It is the main survey conducted by Central Statistics Office (CSO), Industrial wing, Government of India.

## **2.3 Institutions: Meaning and Significance**

### **2.3.1 Meaning of Institutions**

The basis of the concept of institutions would be the ‘Agent-Structure’ mechanism and being a conceptual term, there may be various conceptions and definitions of it. The idea of institutions can be traced back to the Smith (1776) who set forth the famous notion of the ‘invisible hand’ in the context of the market system. Formal and informal institutions would be the Smith’s ‘invisible hand’ which takes care of the market as an institution coordinated by the pricing system. But till 1918, Institutional Economics was not an established and recognizable school of economic thought. Yet by that time, works of Thorstein Veblen had achieved an enormous popularity who famously described

institutions as involving “settled habits of thought, common to the generality of men and being an outgrowth of habit” (Hodgson, 1998; 2004). Hamilton (1932) also described institutions as a prevalent and permanent way of thinking which has its roots in the habits and customs of the people. Another contribution to the old institutional view was made by Mitchell, who developed the institutional economics of aggregates and hinted the idea of ‘Downward Causation’ from institutions to individuals. Explaining the view of Commons, Mitchell (1935) mentioned the institutions as collective action in control of individual actions. The views of these economists with the core ideas of habits, way of thought, downward causation and institutions are referred as ‘Old Institutional Economics (OIE)’ in the literature of economics. They have explained the permanence and settled, though evolutionary nature of institutions.

It is commonly said that the New Institutional Economics (NIE) began with the Coase’s article on the nature of the firm (1937) which introduced the concept of transaction costs into the economic analysis (Coase, 1998). Coase is believed to have developed the connections between the institutions, transaction costs, and neoclassical theory. The approach developed in the ground breaking work of Williamson (1973) on markets and hierarchies is also asserted as an earlier NIE approach.

However, the ideas of the NIE received widespread recognition when Douglass North was named the co-recipient of the Nobel Prize in 1993 for his work on institutions. He has perhaps provided the most commonly agreed definition of institutions. “Institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions and codes of conduct) and formal rules (constitutions, laws, property rights)” (North, 1991). After some modifications, North (1995) redefined institutions as “the constraints that human beings impose on human interaction”. He mentioned most often

the terms formal and informal constraints rather than formal or informal rules to overcome the misconception that all institutions are decreed in laws or rules. The definition of North suggests three fundamental elements of institutions which structure the institutional framework: the first one is the formal or written constraints- political systems, laws, governing contracts, the imposition of taxes, tariffs, and regulations, etc. These constraints can be created by governments as well as within firms and organisations. The second one is the informal constraints, written in the minds and hearts of people-culture, norms of behaviour, customs, values, and religions, etc. The last one is the enforcement mechanism. Institutions have no meaning without practice or enforcement. North (1991) also explained enforcement to not only mean enforcement of contracts but also protection of lives, goods, and services.

It also seems necessary to explain the distinction between the institutions and organizations. Institutional economists like North have defined organizations as a group of actors or players confined with a common purpose or certain objectives, while institutions are referred to as the rules of the game of a society (Boliari and Topyan, 2007). Organizations can be of many forms like political parties, firms, cooperatives, unions, religious organisations, schools and universities with varied objectives whereas; institutions are the rules and constraints which govern these organizations. It is important to note that there may be some individual constraints within an organization which depend on the preferences and personalities of each individual agent. However, institutions often do not refer to individual constraints, but rather point to a common rule or constraint. Constraints of institutions are those rules, laws, regulation, norms, and beliefs that constitute a certain framework and put limits on social and economic interactions.

The basic idea of Institutions (formal and/or informal), i.e. the aggregate structure having influence on the individual units which develops a particular behaviour on them can be best explained with the help of a diagram (Figure 2.1) as indicated by Hodgson (1998).

**Figure 2.1: The Institutional Action-Information Loop**



**Source: Hodgson, 1998**

Individuals act according to the information and thoughts they have acquired from the institutions. Institutions provide guidelines to them by constraining and/or enabling their activities. They are like prescriptions regarding what is allowed, what is prohibited, what one can expect from other individuals and various agencies and what is expected and desired from an individual. On the other side, the structure of institutions is determined by the interactions of the individual agents. The agent-structure mechanism of any institutional set up is a two-way structure as described in the figure. Institutions are not under individual control, but the individual actions of several actors which are under their control lead to the evolution of institutions (Hall and Soskice, 2001). Therefore, it is not only the given structure which can influence the individuals, these agents preferably the ‘innovators’ can also change the structure. Individual interactions and their learning through repeated experiences may bring changes. Learning results new habits of life and thought which consequently brings changes in institutions (Henrekson and Sanandaji,

2011). There are subsequent and continuous changes of institutions through individual and/or entrepreneurial feedback.

Based on this whole 'Agent-Structure' mechanism Claugé et al. in 1997 have mentioned five branches existing within the NIE: Transaction Cost Economics, The Economics of Property Rights, The Economics of Imperfect Information, Collective Action Theory and The Evolution of Rules and Norms (Boliyari & Topyan, 2007).

### **2.3.2 Significance of Institutions**

The institutional set-ups provide guidance regarding what actions are allowed or constrained, who is eligible to make decisions, what procedures should be followed and what the payoffs are available. They shape and administer the interactions of human beings by providing a help in having a prior knowledge of what other people will do (Rodrik, 2000). They are intended to provide some necessary defences before one enters into transactions (Groenwegen, Spithover, and Berg, 2010). Therefore, institutions have always been developed by human beings to create order and to reduce uncertainty in exchange (Dugger, 1995). They are believed to bring order to an otherwise chaotic world.

Institutions are also considered as a vital component in understanding the development of nations. North (1991) considered them as the underlying determinants of the long run performances of economies as they structure the incentives within an economy and thereby induces the behaviour of agents. Romer (1998) made an important comment that it must not be presumed that allocating more resources to the basic researches will automatically lead to economic achievements. Businesses and places that provide good environment are just as important as conducting research (as cited in Cortright, 2001). The accumulation of factors of production may only cause an immediate growth, whereas the primary cause resides in the incentive structure that promotes the individual

effort, investment and entrepreneurship (Braunerhjelm and Henrekson, 2013). Veblen explained the function of institutions as a storehouse of social knowledge and guidebook for incentives, sanctions or constraints (Hodgson, 2004).

Institutions are believed to constrain and enable social and economic interactions. The constraining function of institutions suggests that the constraints of the structure are intended to produce similar outcomes, irrespective of the objectives and behaviour of the individual agents. Whereas the enabling function is derived from the fact that institutions as such structure incentives and promote the environment towards productivity (Zvirgzde, Schiller and Diez, 2013). Boettke and Coyne (2009) mentioned the statement of Smith that “The different talents and dispositions we possess do not stem so much from nature, but from habits, customs and education”.

Institutions have also been identified as the primary causes of reversal of income and prosperity around the world. It is the emergence and diffusion of a novel set of institutions most often extractive institutions which made the dramatic reversal of fortune in the countries like India and Indonesia, which were once prosperous to one which is now among one of the poor economies of the world (Acemoglu, Johnson and Robinson, 2002).

Institutions play an important role in determining the economic behaviour of the agents and their economic transactions. Two locations with similar geographical features, demographics, and the similar level of resource inputs may have different economic performances because of different institutional structures (Hall and Sobel, 2008). The differences in their ‘costs of exchange’ depend on their judicial systems, political systems, social systems, educational systems, cultures and so on (Coase, 1998).

While recognizing the differences between institutional frameworks and their influence on economic performance, Hall and Soskice (2001) introduce the concept of Comparative Institutional Advantage. They mentioned that the concept of scarcity applied to natural resources in an absolute sense, but was relevant to institutions only in the relative sense, and was related to the fast and easy availability of resources for the agents. Constraints such as trust, secure property rights, information, skill and education differ across the societies, but can sometimes be enhanced; therefore they are not scarce in an absolute sense rather in a relative sense.

Thus, institutional differences can be one important element to explain the differences in economic performances across the regions and over time. Glaeser, Scheinkman and Schleifer (2003) advocate institutional reform more important than redistribution for economic development.

#### **2.4 Role of Institutions in the Entrepreneurship**

The simple notion of the presence or absence of entrepreneurship culture in any particular society and among its people has some challenging views today. The conception that an undersupply of entrepreneurship in a region is due to the natural lack of entrepreneurial culture among its inhabitants does not seem to be true. Human minds are, amongst other things inventive and innovative. When provided with adequate opportunities and incentives, the basic nature of the human is to improve the ways in which things are done (Potts, 2003). Sautet (2005) made a relevant claim that entrepreneurial activity is never in short supply and is not dependent on culture or race, it can be observed in every society and across all ethnicities. Ultimately, what matters is the reality of the incentives that people experience. Even a strong and persistent entrepreneurial culture does not guarantee successful entrepreneurship. The presence and

absence of adequate institutions dictate the performances of entrepreneurs and thereby the economy.

Rodrik (2000) made a statement that incentives would not work or generate expected results in the lack of adequate institutions. Several favourable conditions are required besides incentives. If government policy of subsidies or other such policy initiatives is directed towards increasing entrepreneurship through maximizing the number of start-ups, this may stimulate individuals to start businesses for the wrong reasons. There is a probability of starting businesses not because they have an idea or skill that they want to try and commercialize, but simply because they have an access to money for starting a business. These firms or businesses are likely to be unsuccessful in the lack of other complementary institutions. They may even shut down once the scheme is removed. Moreover, the low-quality institutional framework may hamper the development of small firms to grow into a medium sized or large firm, causing the 'missing middle' phenomenon (Dinh, Mavridis and Nguyen, 2010). Therefore, McMillan and Woodruff (2002) proposed that to explain the lower entrepreneurship level, one should first look towards the weakness of institutions.

Institutions should be strengthened and made favourable for the entrepreneurs to make them productive and successful. Hall and Sobel (2008) argued that policy makers should focus on improving institutions, rather than trying to frame policies such as increasing the quantity of subsidies for education, technology, venture capital, etc. As institutions are strengthened and the incentive structure changes, there is a possibility of more and more entrepreneurial activities shifting towards productive entrepreneurship (Acemoglu and Johnson, 2005).

Entrepreneurship also seems not to be absolutely dependent on the resources in an economy, but depends on the institutional environment and quality, in which there is exploitation of resources and opportunities. Therefore, differences in entrepreneurial opportunities and activities are not believed to be purely due to differences in entrepreneurial spirit and resources but are due to differences in institutions instead (Sautet, 2005; Boettke and Coyne, 2009).

Execution of institutions has direct and indirect effects on both the supply and demand of entrepreneurs (Acs and Szerb, 2010). They provide incentives as well as constrain the opportunities available at any point of time, according to which entrepreneurship flourish, shrink or vanish. The basic idea of Comparative Institutional Advantage as advocated by Hall and Soskice (2001) is also based on the fact that the institutional structure of a particular economy or region would have certain advantages for the specific types of activities, which tends to make entrepreneurs or firms less mobile even when profit opportunities are available elsewhere but with Comparative Institutional Disadvantage.

Entrepreneurship may be scarce in some economies but the supply of some characteristics related to entrepreneurship may, in fact, be in surplus; that is, they could not be used simply because of lack of motivational state. Slightly favourable changes in institutional framework may turn around entrepreneurial scarcity into an abundant supply (Leibenstein, 1968). Therefore, policy makers may focus their attention on the improvement of institutions and their better enforcement rather than on entrepreneurship, to promote entrepreneurship as a means of economic development (Braunerhjelm and Henrekson, 2013). The region with good parametrical structure can catch up innovations even outside the boundary and entrepreneurship within a favourable institutional

framework may in effect outweigh the resource endowments and scarcity which are considered as the prime determinants of economic performance (Harper, 2003).

## **2.5 Institutional Variables and Regional Traits**

From an empirical and policy viewpoint, it is not enough to merely acknowledge the importance of institutions. It is also necessary to find out the answer to a natural policy relevant question: which variables or regional traits are conducive for entrepreneurship? Lin and Nugent (1995) made a relevant statement that the question before policy makers, therefore, is no longer “do institutions matter?”, but “which institutions matter and how does one acquire them?” To answer these questions institutions need to be recognisable and in empirical format. However, institutions as a concept cannot actually be directly measured. There can be some attempt to capture it through various determinants and/or outcomes.

The effectiveness of any institutional set up is determined by the actions of several complementary elements. To get an isolated picture of the variables and their exclusive relationship with entrepreneurship may have unlimited problems. There is a need for coherence among all related variables to deliver a unified and mutually reinforcing environment. Hence, it is very difficult to identify and offer necessary and sufficient conditions for entrepreneurship development. Moreover, it is also complex to determine the specific institutions related to entrepreneurship. Gupta, Guo, Canever, Yim, Sraw and Liu (2014) have stated that though some institutions are specific, many of them are of a general nature and influence every aspect of the economy. These institutional variables may overlap across different aspects and classifications. Therefore, policymakers need to pay careful attention to many variables and determinants which are directly or indirectly related to institutions that structure the incentives for entrepreneurs and constrain their

activities. Since institutions relevant to various activities (including entrepreneurship) may not be evenly distributed; therefore, there may be always a room for policymakers to build up a favourable local environment so that entrepreneurship can flourish.

The efficiency of an institutional set up hinges on the various complementary elements and therefore to find an isolated one to one direct and an exclusive relationship of these variables with entrepreneurship is not reasonable. One has to study them in a cluster; in a form of institutional framework. There is a need of coherence among all related variables to deliver a unified and mutually reinforcing environment.

Informal institutions like customs, tradition, norms and religion change very slowly; therefore NIE has been concerned principally on formal 'rules of the game' and 'play of the game (governance)' for desired outcomes (Williamson, 2000).

There is no one set of institutions that suit all societies, but there are advocacies for some supporting institutional variables by different economists. From the review of various literature from the various disciplines, it has been attempted in the present study to cluster the various institutional variables related to entrepreneurship development under four categories: those related to opportunity, those related to security, those related to efficiency and those related to the social and political environment.

### **2.5.1 Opportunity-Related Institutional Variables**

#### **Market Size**

The Global Entrepreneurship Monitor Global Report (GEM, 2011) has recognised the efficiency enhancing capacity of market size for entrepreneurship development. The size of the market has been put forward by Acs and Szerb (2010) as a combined measure of the domestic market size (in terms of GDP or income) and urbanisation of a region.

In the Mills and Schumann model, high level of output can be interpreted as one source of entrepreneurial opportunities (Audretsch, Keilbach and Lehman, 2006). It implies a larger market size. On the other side, low purchasing power may act as a formal institutional barrier for entrepreneurship development (Aidis, 2005). Many studies (Acs and Szerb, 2010; Alonso and Garcimartin, 2010; and Rodrik, Subramanian and Trebbi, 2004) have advocated the positive relationship between growth and institutions. But even a high level of output may not create limitless opportunities for entrepreneurs in the economy. The diversity of activities is also essential. Urbanisation fills this gap as urbanised economies imply a much more diversified demand structure and may offer opportunities for the diversity of activities which provides flexibility and tends to prevent a process of negative lock in (Lambooy and Boschma, 2001; and Lingthelm, 2010). More dynamic and diversified the market is, the greater the perception of opportunities (Vidal-Sune and Lopez-Panisello, 2013). Moreover, urbanization generally creates an attraction for the businesses because of existing infrastructure and may also decline the willingness of people to conform to the old practices of living (Verheul, Wennekers, Audretsch and Thurik, 2002).

Hence, the interaction of higher per capita income and urbanisation may create new market niches and provide more opportunities for entrepreneurs. Both the variables may jointly generate an agglomeration effect on the opportunity perception of entrepreneurs. They contribute to developing a higher quality institutional environment for entrepreneurship by creating more opportunities and a larger market size.

### **Size of the Government**

Studies like those of Aidis et al. (2009) and Bruce & Deskins (2010), have found negative effect from the size of the state sector on entrepreneurial activity, which means

that states or regions that have larger governments, as measured by state expenditures per capita or other means, tend to have lower levels of entrepreneurship. Aidis, Estrin and Mickiewicz (2009) have stated that in general, a large state sector militates against the entrepreneurial activity, through both revenues and expenditures. A larger size of the government activities limits the opportunities for private entrepreneurs. It curtails economic freedoms through taxes, licenses and other means. Moreover, direct government activism has a general tendency to favour the large established corporations which adversely affect entrepreneurship (Fogel, Hawk, Morck and Yeung, 2008).

However, the roles of magnitudes, signs and statistical significance of the taxes have not been conclusive. Studies like those of Aidis (2005) have recognized a high level of taxes as a formal barrier to entrepreneurship. But empirical results (Bruce and Deskins, 2010; Hansson, 2012) have generally indicated that taxes have minor and scattered effects on entrepreneurship.

But, without government providing the rule of law and protecting private property, productive behaviour will not flourish privately (Pingle and Mahmoudi, 2016). Lack of public goods may increase the risks associated with the start-ups and also reduce the expected returns. Therefore, the provision of public goods with externalities justifies the presence of government spending.

Islam (2015) in his working paper found a positive relationship between increasing the share of social and public goods at the cost of private subsidies and the entrepreneurship. He argues that the expansion of total government spending which includes a huge increase in private subsidies at the cost of social and public goods is detrimental for entrepreneurship as the beneficiaries of private subsidies are more concentrated. On the other side, increasing government spending in the usual public goods such as law and

order and infrastructure may create an environment that is conducive to entrepreneurial activity.

Therefore, it is the composition of government size which matters. Increasing the size of the government from a very small level and in the provision of social and public goods may increase productivity rather than reduce it (Pingle and Mahmoudi, 2016; Islam, 2015). Consequently, lower income or less developed countries may benefit from an increase in government size, especially in terms of social and public goods.

### **Openness**

Trade openness is believed to expand markets and introduce new ideas. It constrains the local monopoly and promotes a competitive environment by creating a demanding and dynamic environment. International trade and investment through openness encourage competition and entrepreneurship. It can facilitate the process of learning and imitation of good practices from other countries. The studies of (Acs and Szerb, 2010; Alonso and Garcimartin, 2010; Fogel, Hawk, Morck and Yeung, 2008) advocate openness of an economy for the better institutional framework. On the other hand, the study of Scholman, Van Stel and Thurik (2014) in case of OECD economies suggests that economic openness has an important role to play in creating entrepreneurial opportunities but is related to the cyclical performances of the countries. When economies are booming, the share of self-employment may be increasing in the medium or long run, but it may be opposite in case of recession or slow growth. Therefore, it is difficult to make a general conclusive statement.

## 2.5.2 Security-Related Institutional Variables

### Property Rights

Property rights represent all the rights that have economic value. In the context of entrepreneurship they are considered of two types; the first one as the private property rights: the right to exploit and dispose of private property and the second one as the property rights to contracts: the entitlement to claim an act from another person as stated in the contract. Private property rights institutions are intended to protect citizens against expropriation by the government as well as by powerful elites and contracting institutions are meant to enable and/or regulate private contracts between citizens (Acemoglu and Johnson, 2005; and Honorati and Mengistae, 2007). Therefore, secure property rights constrain the powerful authorities and people and enforcement of contracts constrains opportunism.

Institutional economics literature has widely mentioned the importance of secure property rights in encouraging both investment and innovation. Property rights and their security allow the investor and the innovator to receive rewards of their efforts (Bardhan, 2005). Agents need some guarantee that the decisions they take and contracts they make will be protected and they will be able to receive returns from them, if any. Thus, systems of property rights ensure that entrepreneurs can get back the rewards for which they have made contracts (Aidis, Estrin and Mickiewicz, 2009). Otherwise, the absence of secure property rights will discourage investment and innovation. Groenwegen, Spithover and Berg (2010) have mentioned the view of Smith (1776) that “Commerce and manufacturers can seldom flourish long in any state.... in which the people do not feel themselves secure in the possession of their property”. An entrepreneur would not have the incentive for innovation unless s/he has sufficient control over the return of the assets in the process of production or improvement (Rodrik, 2000; and Aidis, Estrin and

Mickiewicz, 2009). Control is also important because there are possibilities of ownership without sufficient control over the return from the investment or it is also possible to have control without ownership. Hence, strong protection of property rights and control over the return of investment plays a key role in the formation of an institutional environment conducive for entrepreneurship.

### **Rule of Law**

Usually, rule of law is a perceptual concept and refers to the protection of persons and property against violence, theft and other such activities. It demands the adequate enforcement of law and directs that violations of law should be adjudicated by an independent judicial system. Therefore, it is to some extent related by the sense of protection of property rights. The rule of law is generally enforced by governments through police, judiciary and other regulatory institutions and is scored higher when there is a strong court system and sound political institutions while lower scores indicate the traditions and practices of using physical force and illegal means (Keefer and Knack, 1997).

The fundamental underpinnings of institutions are the presence of an effective legal structure and a court system which can enforce contracts and laws efficiently (North, 1991). The weak judicial system imposes significant costs on doing business more specifically in developing countries (Rodrik, 2008). The inefficient judicial process may cause more violations of property rights, breach of trust and violence. Fogel, Hawk, Morck, and Yeung (2008) argued that weak and insecure property rights, as well as lack of faith in the judiciary, discourage investment even though opportunities exist.

Individual perception about the fairness and justice is quite essential as it obviously affects the decisions regarding investment. Harper (2003) advocated that rule of law

allow entrepreneurs to utilise their unique competencies and knowledge in the best way. In the absence of rule of law, public authorities and powerful individuals are susceptible to engage in several arbitrary and inconsistent unproductive activities that can dampen entrepreneurship and economic growth. Thus, Rule of law along with secure property rights improve the transactional trust and make coordination failure less likely which is important for entrepreneurship development.

### **2.5.3 Efficiency-Related Institutional Variables**

#### **Education**

Accumulation of human capital in the form of education is an important aspect of the supply of entrepreneurship. Therefore, GEM Report (2011) of GERA has recognized the role of education in enhancing the efficiency of entrepreneurship. Positive relationship between education and accomplishment of entrepreneurial experiments is supported by the studies of Acs and Szerb (2010); Aidis, Estrin, and Mickiewicz (2009); Gupta, Guo, Canever, Yim, Sraw and Liu (2014); and Nikolova and Simroth (2013). Since an important risk (potential) investors and business owners face in some countries is the insufficient or inadequate availability of educated and skilled personnel, Aidis (2005) considered low education level as an environmental barrier of entrepreneurship. It may constrain the participation in entrepreneurship.

Education helps entrepreneurs in realizing that opportunities exist. Moreover, Alonso and Garcimartin (2010) stated that a more educated population not only demands more transparent and dynamic institutions but also permits to build them. Fogel, Hawk, Morck, and Yeung (2008) argued that a wide and general availability of higher level of education makes a greater fraction of the population available as entrepreneurs. In an empirical study on the US states, Bruce and Deskins (2010) found that states in which a

larger share of the adult population holds a college degree tend to have higher rates of tax-based entrepreneurship. Hence, Verheul, Wennekers, Audretsch and Thurik (2000) mentioned the concluding statement of the Hay and Camp that the larger a country's investment in education at the tertiary level, the higher the rate of new firm formation.

Though entrepreneurship is an individual phenomenon and it is difficult to train people to discover opportunities; it is possible to make them capable to assess such opportunities once perceived through education (Leibenstein, 1968). Therefore, although education might not be a robust determinant of self-employment, it certainly is a strong determinant of entrepreneurship (Henrekson and Sanandaji, 2014).

### **Credit or Finance**

It is unreasonable to imagine any development of entrepreneurship without adequate credit or finance. Schumpeter (1934) pointed out that the importance of credit cannot be dissociated from the entrepreneurial action. Improving access to finance boost the entry rate and firms' growth, on the other hand, lack of credit desists entrepreneurs from starting a business even though there is availability of opportunities. Aidis (2005) recognised lack of funds for business investment as environmental barriers to entrepreneurs. Entrepreneurship is less likely to be implemented in the form of start-ups when it is difficult to secure financing because of capital market imperfections. Studies have considered access to finance or credit as one important element of institutional quality for entrepreneurship and lack of it as a key impediment to entrepreneurial development (Lloyd-Ellis and Bernhardt, 2000; Estrin and Mickiewicz, 2010; Dinh, Mavridis and Nguyen, 2010; and GERA, 2011).

## **Availability of Information**

Availability of information is a vital component in the process of innovation. There are endless opportunities for people to improve their position by gaining more or better information (Godin, Clemens and Veldhuis, 2008). Larger information access reduces the transaction cost which is an important barrier to entrepreneurship development. Therefore, access to relevant information through various communication means and media sources may determine the rate of entrepreneurship. Additionally, greater transparency through media leads to more accountable institutions and lead to a more active and demanding citizenry and thereby better institutions. For example, mass media contribute to social transparency, which raises willingness among the people to challenge the elites and the established patterns (Fogel, Hawk, Morck and Yeung, 2008; and Subramanian, 2007). Thus, lack of information may constrain the entrepreneurial activities, even though opportunities exist and accessibility to information may enhance the efficiency of entrepreneurship.

### **2.5.4 Institutional Variables Related to the Social and Political Environment**

Other than the above-mentioned variables of institutions related to entrepreneurship, there are some general, but important, institutional conditions.

#### **Political and Policy Stability**

It is believed that a politically stable country or region will have lower levels of risk and transaction/contracting cost and higher levels of predictability and accountability. Dutta, Sobel, and Roy (2013) found that political stability within a country does indeed lead to an increased rate of entrepreneurship and wealth creation. On the contrary, the political instability creates uncertainty among the investors and therefore discourages them to take

risks in the expectation that policies will not remain stable as frequent changes in government may make leaders less likely to accept the commitments of previous governments. Therefore, in uncertainty firms are likely to conduct routine behaviour; which may limit the available options to a large extent (Lambooy and Boschma, 2001). Moreover, political instability creates fear of replacement among the leaders which make them more likely to expropriate and be corrupt rather than to develop better institutions (Knack and Keefer, 1995).

### **Income Distribution**

Income distribution is one of the variables considered as the determinants of institutions. Equal distribution of income provides equal opportunities to all so that everyone has the incentive to better themselves and to participate productively in the society.

GERA (2011) recognised that the realisation of the full potential of entrepreneurial human resources in societies is more likely when it is available to all. Equality leads to social and economic inclusivity and greater the degree of social and economic inclusion the larger the potential pool of participants available to contribute to the creative process essential for innovation (Wolfe and Bramwell, 2008).

On the other hand, strong inequality causes divergent interests leading to conflicts, socio-political instability, and insecurity. Acemoglu, Johnson, and Robinson (2002) have argued that a society with a small section, for example, a class of landlords, holding all wealth and political power may not be the ideal destination for investment. Inequality crucially shapes institutional subversion and is not conducive to the security of property rights, as it allows wealthy individuals to subvert the political, legal and regulatory institutions of the society for their self-interests by favouring corruption and rent seeking behaviour rather than entrepreneurship and common good (Glaeser, Scheinkman and

Shleifer, 2003; and Alonso and Garcimartin, 2010). Inequality may also lead to some individuals to take decisions that are against their wishes or desires.

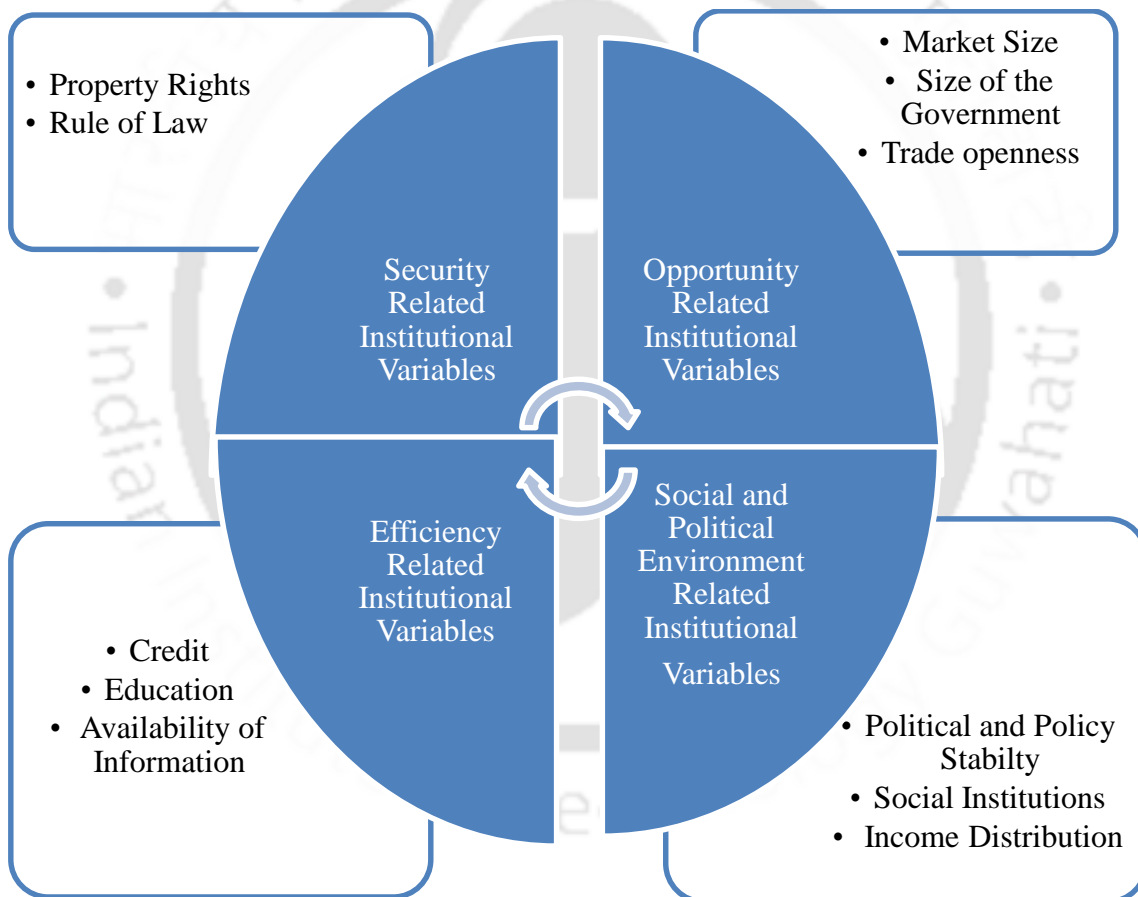
To some extent, it is the persistence of wealth inequality, not the entrepreneurial efficiency, which determines the activities chosen by individuals. Inherited wealth is one of the primary determinants of occupation because wealthy agents have sufficient capital to invest (Lloyd-Ellis and Bernhardt, 2000). Access to wealth is found to be positively and significantly correlated with the probability of becoming self-employed and as the equality improves, fewer agents are wealth constrained (Lloyd-Ellis and Bernhardt, 2000; and Hansson, 2012). There are also some studies like Lecuna (2014) which argue that a rise in economic inequality increases the probability of entrepreneurial activity. Therefore, the view regarding the impact of income distribution on entrepreneurship is not free from disagreement.

### **Social Institutions**

Social institutions are referred in many forms as social capital or social networks in the literature and imply concepts such as norms, beliefs, trust and civic cooperation, which correspond largely to the informal constraints. Many of these informal institutions (customs, traditions, norms, religion) may be significant determinants of entrepreneurship, but are often non-calculative, and change very slowly, sometimes by the order of centuries, because of their embeddedness (Williamson, 2000). Hence, Krasniqi and Kume (2013) have suggested the role of social institutions as complementary in understanding the role of other institutions. For example, societies which fail to honour the self-made success and provide social status to innovators because of its authoritarian and hierarchical nature is a constraint to entrepreneurship. Similarly, lack of trust and cooperation may limit economic transactions and thereby innovation.

All the above-mentioned variables under the four categories may be presented as an institutional framework for entrepreneurship in a diagrammatic form (Figure 2.2). The figure depicts the various institutional factors which may be directly or indirectly related to the entrepreneurship and may enhance the overall entrepreneurship of a region. These variables collectively create an environment conducive for the entrepreneurship.

**Figure 2.2 Institutional Determinants of Entrepreneurship**



## 2.6 Role of Infrastructure

The studies of entrepreneurship of any type and of the firms of any size are incomplete without the discussion of the infrastructure. Infrastructure is different than the physical

capital investments of the firm. Callaway (2004) stated that infrastructure is external resources to the firm that is available beyond the level of the firm. It includes power and connectivity through roads, railways, water, air and communication networks, etc. Public organisation often and sometimes in collaboration with private sectors play a major role in creating and providing such public goods which benefit a large section of the community including entrepreneurs. The provision of adequate infrastructure is often seen as a necessary prerequisite for economic advancement (Button, 1998). Audretsch, Heger, and Veith (2015) found infrastructure to be positively associated with start-up activity. Infrastructure enhances the connectivity of people, which in turn is beneficial for entrepreneurial activities and therefore infrastructure matters in entrepreneurial decisions (Audretsch, Heger and Veith, 2015). For example, transport infrastructure improvements may lead to decrease in transport costs and hence stimulate inter-regional trade.

### **2.7 Role of Business Incubation Centres**

Business Incubation is regarded as an important policy tool for job creation, urban economic revitalisation and the commercialisation of university innovations which facilitates entrepreneurial development and focus on providing targeted resources and services so that businesses can survive and grow (Hackett and Dilts, 2004; Ayatse et al., 2017). Similarly, Al- Mubarak and Busler (2013) have explained business incubation as an economic and social program which provides the intensive support to start-up companies, coach them to start, and accelerate their development and success through business assistance.

The vehicles for this business incubation processes are the Business Incubation Centres. Hackett and Dilts (2004) have explained a business incubator or business incubation centre as a shared office-space facility that seeks to provide its incubatees (i.e.,-

“Portfolio” or “Client” or “Tenant Companies”) with a strategic, value-adding intervention system of monitoring and business assistance. Thus, a business incubator is defined as a more or less formalised entity with an infrastructure in the form of expert networks, business secretarial, administrative support and capital investment intended to nurture incubated start-ups with critical resources in the pursuit of survival and growth (Pettersen et al., 2016 Ayatse et al., 2017). The incubators can be for-profit, non-profit-affiliated with some government agencies or housed with some higher education institutions (Peters et al., 2004).

Once the idea is formed/recognised and the entrepreneur decides to proceed with that idea, incubation centres can play a significant role from the point of assembling the resources to harvesting the rewards (Peters et al., 2004). It further helps in building networks with external companies, organisation and other individuals and foster the network resources such as a firm’s access to information, knowledge, reputation and input factors (Pettersen et al., 2016). The evidence supports the incubation as a powerful instrument that must be encouraged and supported as an important component of the entrepreneurial ecosystem and therefore, it is required to establish strong incubation centres that will assist businesses and reduce the likelihood of failure (Ayatse et al., 2017).

However, Manimala and Vijay (2012) in their working paper have explained business incubation centres as “Task Environment” which consists of factors that facilitate the specific needs of enterprises such as technological inputs, finance and investment, legal and commercial services rather than the general environment (Institutions). General environment or institutions refer to the overall economic, social and political factors that have an overarching influence on people’s willingness and ability to undertake entrepreneurial activities.

### **2.7.1 Business Incubation in India**

Business incubation is a nascent topic in India, but is quickly gaining attention due to the explosive growth of start-ups in the last decade and the business incubators in India have started establishing stronger local, regional and global networks (Kumar, 2015; Indian Institute of Corporate Affairs (IICA), 2015). The Government of India is doing great work to promote entrepreneurship through various agencies like Technology Business Incubators (TBIs) and Science and Technology Entrepreneurs Park (STEPs) which incubate technology ideas and provide support to reach the marketplace. The goal is to nurture successful indigenous technologies and growth-oriented entrepreneurs (Kumar, 2015). However, in India, most of the incubation facilities are housed with higher education institutions like Indian Institute of Technology (IITs), Indian Institute of Management (IIMs), National Institute of Technology (NITs), National Institute of Design (NID) and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) which are funded by Department of Science and Technology (DST), National Science and Technology Entrepreneurship Development Board (NSTEDB), Ministry of MSMEs, Biotechnology Industry Research Assistance Council (BIRAC) and other government agencies (Kumar, 2015; IICA, 2015). Though these educational institutions have a ready student pipeline for incubation and enthusiastic academicians to mentor startups, the success rate is not beyond forty percent (IICA, 2015). Nevertheless, the positive thing is that the regional cities are becoming educational hubs and making startups a pan-India phenomenon (Economic Times, Dec 05, 2017). Regional entrepreneurship may help in solving the social challenges like financial inclusion, education, agricultural technology and others in the country.

## 2.8 Case of India

Multiple studies have considered institutions in advanced economies and institutional differences across the countries. Three large research projects at the World Bank, The Heritage Foundation, and the World Economic Forum are actively involved in measuring the quality of institutions across countries and over time (Acs & Szerb, 2010). The Global Entrepreneurship Monitor (GEM) is interested in understanding institutions and economic development, albeit from a slightly different perspective of the business formation process. But, there is a shortage of evidence for developing countries like India.

Rodrik and Subramaniam (2005) have made an interesting statement that viewed in the context of democracy and an independent judiciary India emerges as an outlier in cross country studies, with a strong institutional base but poor economic performance (as cited in Dash & Raja, 2009). The probable reason behind this statement would be the consideration of the presence of the various institutions rather than the enforcement or implementation of these institutions related variables. Mere the presences of the Institutions like independent judiciary, property rights, and democracy does not guarantee their success. Enforcement and efficiency also matter. In recent institutional research, the focus is shifting from the assignment of rights and certification to the institutional environmental conditions that make execution of these rights (Aidis, Estrin and Mickiewicz, 2009). Moreover, the statement of Bardhan (2005) that in any case cross national studies do not usually give us good insights into the mechanism through which institutions affect development seems more relevant in case of India. The provision of most of the institutional factors in India is either in the hands of state governments or under the joint control of Central and State governments. Areas like law and order, courts and justice, local governance, education, land and contracts, sales taxes

and many minor taxes come under the state list or concurrent list of the Indian constitution. The degree of implementation of these variables varies across the states.

## **2.9 Studies in Indian Context**

Indicus Analytics (2004) is a study in the context of investment climates across Indian states using various institutional indices such as corruption, quality of infrastructure, the rule of law, property rights and the difficulty of doing business which has been calculated based on the perception survey of business professionals, managers, and entrepreneurs. The purpose of the study has been to rank Indian states on the basis of investment climate and attractiveness. It has indicated a high degree of heterogeneity across the states of India on the basis of its findings.

The study of Veeramani and Goldar (2005) is also a similar study on the basis of certain subjective notions of Investment Climates (IC) in the states expressed by entrepreneurs and company managers apart from collecting quantitative information on a number of IC indicators from World Bank's Firm Analysis and Competitiveness Survey (FACS). They find that the nature of IC exerts a significant determining effect on Total Factor Productivity (TFP). The National Knowledge Commission has also done such a study on entrepreneurship in India in the year 2008 based on formal one-on-one interviews with entrepreneurs and other stakeholders of the entrepreneurial ecosystem.

While these studies are to a large extent based on perception survey and therefore are subjective, the study by Subramanian (2007) has used some objective indicators for quantification of institutions like power losses, disposal and conviction rates of murder related cases along with perception based measures of institutions in case of India.

Dash and Raja (2009) have made an attempt to use objective measures of institutions such as index of property rights, index of legal efficiency, rule of law, index of political stability, index of economic freedom and the index of the state as provider of necessary

goods and services. They have used several proxies to measure these indicators across the Indian states. Debroy and Bhandari (2014) in their studies have developed the index of economic freedom for states of India based on 'Economic Freedom of the World (EFW)' methodology. This study is rich in its content and has used many reasonable proxies and indicators to capture the performances of sub-national Institutions. It is a comparative study of states of India over time and is based on objective indicators.

### **2.10 Summing up:**

From the above discussions, it becomes clear that though there is a lack of generally accepted definition of entrepreneurship, there is agreement that the concept comprises numerous dimensions like unique traits, risk taking, opportunity recognition, coordination, recombination, motivation and exploitation and innovation. It is also evident that the economy's prosperity depends greatly on a dynamic entrepreneurship sector. The difference of entrepreneurial opportunities and activities is one important factor determining the varying levels of wealth and prosperity across the spaces.

Though Entrepreneurship is a non-measurable concept, it is commonly proxied through various activities performed by the entrepreneurs. The most common indicator of entrepreneurship tends to be the number of established enterprises in a region. Among the various measures of the entrepreneurship, MSMEs has an important place and is considered as the second best link for measuring the entrepreneurship. It is believed to nurture the entrepreneurial talent.

It is apparent from the discussions on the institutions that the structure of institutions, both influences and get influenced by the individual interactions. The formal, informal and the enforcement mechanism of the institutions are to create order in the society and to reduce uncertainty in exchanges. They are the underlying determinants of the long run performances of economies. Institutional weaknesses are often advised to be considered

for the lower development of the entrepreneurship. It is also argued that policy makers should focus on improving institutions, rather than trying to frame policies such as increasing the quantity of subsidies for education, technology, venture capital, etc. Thus, entrepreneurship seems to be dependent on the institutional environment and quality.

It is further evident that there is a need for coherence among several related variables to deliver a unified and mutually reinforcing environment for the entrepreneurship development. Various institutional variables/ regional traits advocated as supporting institutions to the entrepreneurship are: larger market size, lower size of the government and openness of the economy; higher level of education and credit ratio as well as better availability of the information; a secure property rights and rule of law with strong and independent judiciary as well as political stability with even income distribution and better social institutions.

Literature also explain that the infrastructure is crucial for the entrepreneurial activities and are external resources to the firms, different from their physical capital investments. Infrastructure enhances the connectivity of people, which in turn is beneficial for entrepreneurial activities.

Though there are cross national studies on institutional environment, they do not provide better insights into the mechanism through which institutions affect development in countries like India. The degree of implementation of institutional factors in India varies across the states. But, there is a shortage of literature on such differences among the Indian states. There are some studies like Indicus Analytics (2004), Veeramani and Goldar (2005), Subramanian (2007), Dash and Raja (2009), Debroy and Bhandari (2014) and a study by the National Knowledge Commission which are one way or another related to the institutional differences for entrepreneurship and investment but with some limitations.

Considering the shortage of studies on institutional environment differences across the various Indian states and their role in the determination of entrepreneurship differences across the regions; the next chapter highlights the important regional differences in the institutional factors and their enforcement differences across the states of India. Though these factors are considered specifically in the context of entrepreneurship, they may explain the general environmental differences across the various Indian states in the field of development.



## Chapter 3

### Institutional Environment: Interstate Differences

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#### 3.1 Introduction

The importance of the institutional environment in the development of entrepreneurship in any form or at any level is well acknowledged today. But, to capture the institutions and the corresponding environment empirically in the same capacity as the theory implies, is very difficult, because institutions are the latent factors within the economies. They need to be recognisable, measurable and testable in any empirically comparable format. However, institutional environment/quality is a structural framework which consists many non-measurable elements also along with the measurable ones. Therefore, one of the difficulties faced in the empirical work on institutions and institutional environment is deficient institutional quality indicators.

Kunčič, (2014) recommended a composite indicator which combines the information of several empirical measures as a better solution because it is hard to find one proxy or variable which would suitably represent the institutional environment and its quality. Acs & Szerb (2010) also mention that though there are methodologies and econometric techniques such as Principal Component Analysis (PCA) and Instrumental Variable Analysis to merge together the indicators and determine the appropriate weight, but may have a problem of negation of potential differences across the states, regions or countries. Knack and Keefer (1997) further add that it is not yet clear how the various institutional traits/indicators ought to be weighed in designing an objective measure of institutional quality. Therefore, a composite index which provides equal weights to all

the variables avoids the problem of accusation of using an arbitrary weighting methodology. Of course, a composite index can always be criticized for other reasons, but many popular and significant studies (EFW, GEDI and Doing Business Index) have used it for the purpose of institutional measurement.

The Global Competitiveness Report of the World Economic Forum (WEF), Global Entrepreneurship Development Index (GEDI) and Global Entrepreneurship Monitor (GEM) provide a long list of institutional variables at cross country level. Though the focus of these studies is not institutions per se, but the competitiveness and entrepreneurial environment, most of the pillars are related to institutions. They provide various contextual features which determine the institutional environment for the entrepreneurs.

However, the institutional framework which is applicable and comparable at a global level across the nations may not be relevant within a country across its states. Same variables and proxies cannot be used at the interstate level and some substitution needs to be done. Additionally, only those relevant variables can be considered that are under state or joint control. The selection of such factors which are directly or indirectly related to institutions and can be compared at interstate level is also constrained by the limited and reliable data availability. Therefore, the attempt to quantify institutions and their quality in this study do not imply the claim to capture it adequately and perfectly rather to compare the institutional environment across the states through the measured variables.

It is also not amenable to use any absolute measurement of institutional environment or quality in terms of some unit or another. Therefore, the level of institutions which indicate better or weaker institutional environment can at best only be ranked in ordinal

terms (Harper, 2003). The methodology of composite institutional quality index adopted in the present study is to explain the interstate differences of the institutional environment with aggregation of variables and indices and to determine the relative position of the states.

Though they have different concepts and meaning, the terms ‘institutions’, ‘institutional quality’ and ‘institutional environment’ are so intertwined and overlapping that it is almost impossible to dissociate one from others. Therefore, it does not seem unreasonable to use these terms interchangeably with some substitutions for the relevant purposes and to reduce complexities in relevance to the references and purposes. Consequently, the present study uses these terms interchangeably throughout the study.

### **3.2 Sources of Data and Methodology**

India comprises 29 States and 7 Union Territories. All states have been included in this study except Telangana, because Telangana is a recently carved state from the Andhra Pradesh (2<sup>nd</sup> June 2014). Consequently, 28 states have been considered in the present study to analyse and compare the entrepreneurial climate of India.

There is no systematic data collection of institution related variables in India at the state level. Hence, it is not possible to use the same variables and proxies which are available in other cross country level studies. The possible solution seems to use closely correlated regional proxies. Therefore, only those indicators have been selected for which proper variables/proxies are available and are meaningful at the state level. The variables have been selected from the same sources for all the states to ensure that the data are defined in the same way.

The Institutional Quality Index constructed to capture the institutional environment of a region is based on the secondary sources of data. As most of the related data are not

available from a single source, the study has to rely on various sources (Planning Commission of India; Census of India; National Crime Records Bureau (NCRB); Ministry of Statistics and Program Implementation (MOSPI); Ministry of Human Resource Development (MHRD) and Reserve Bank of India (RBI) etc. This practice is not unique; as several indexes use data from other sources. For example, the Index of Economic Freedom uses the Doing business data to derive the Business Index sub-index, and the Corruption Perception Index to identify business corruption. Information about the data and its sources are mentioned in detail while providing statistics regarding the construction of the institutional quality index and its sub-indices.

Each variable is considered to be equally important; therefore no weights have been provided to the variables. The variables have been normalized for population and area, wherever required. Normalization is done by dividing the variables by population, area or converting them in the form of a ratio or using it as a percentage of some aggregate so that they become neutral to the size and population of the states. Further, since a variable or indicator should not have higher weight due to its high value and variance, values are normalized to zero to one, that is, '0' as the lowest and '1' as the highest. The formula used for range equalization is as follows:

$$X' = \frac{Xi - Xmin}{Xmax - Xmin}$$

Where,  $X'$  is the normalised value of the variable,  $Xi$  is the original value of the variable of the  $i$ th state,  $Xmin$  is the minimum value of the variable among all the values of the various states and  $Xmax$  is the maximum value of the variable among the values of all the states.

Two different types of indices have been formulated in the study and are discussed below in detail:

### **3.2.1 Simple Average Index**

This index is calculated by using the simple average method. Since, the variables are normalized to zero to one, at least in one case, one of the indicators and/or sub-indices will be zero. Therefore, to get the average view, only arithmetic mean is a possibility.

Each of the ranges equalized variables are aggregated and averaged by using the arithmetic mean to create the categorical sub-indices for each of the areas under consideration. Finally, the composite index of the institutional quality is the simple arithmetic mean of all the categorical sub-indices. All indices are arranged on such a scale that higher values represent better performance in terms of the quality of institutions and environment for the entrepreneurs. Thus, the indicators indicate the relative position of the states. This method of aggregation and arithmetic average for creating a composite index has been used in one form or another in the Doing Business Index and the Index of Economic Freedom by Fraser Institute's Economic Freedom of the World (EFW). The composite index of Economic Freedom for the states of India by Debroy and Bhandari (2014) is also constructed on the basis of the similar methodology.

### **3.2.2 The Penalty for Bottleneck (PFB) Index**

The methodology of Penalty for Bottleneck (PFB) is associated with the name of Zoltán J. Acs and László Szerb and is believed to be based on the application of two interrelated theories: Theory of weakest link (TWL) and the Theory of constraints (TOC).

The spirit of the PFB methodology is close to the O-ring theory of development put forward by Kremer (1993): the space shuttle challenger and its seven member crew are destroyed because of the failure of a single, inexpensive rubber seal. The theory argues that the substitution between the various elements of a system is less possible or impossible and this can create bottlenecks. Just as a chain is only strong as its weakest

link and problems at any point in the chain may reduce the outcome. Quantity cannot be substituted for quality (Jones, 2007; Kremer, 1993).

Similarly, Theory of Constraints (TOC) which is a management philosophy is also focused on the weakest ring(s) in the chain for continuous improvement in the performance of the system. It is based on the idea that every system has at least one bottleneck and an improvement can only be achieved by strengthening the bottleneck, the element that has the lowest value in the structure (Simsit et.al, 2014; Acs et.al, 2014; Acs et.al, 2015). The Theory of Weakest Link (TWL) maintains that the elements of the system are only partially substitutable (Acs and Szerb, 2010; Acs et.al, 2014; Acs et.al, 2015).

Thus, the idea of PFB is based on the argument that improvement can be better achieved by improving the binding institutional barriers and decreasing the variation in the system. Though there is a potential of good features having a positive effect on the weak performing features, various pillars are only partially substitutable with one another and the whole system or structure is characterized by the interdependencies and feedbacks. Strong performance in one dimension may not fully compensate for the weak performance in another dimension. For example, if the availability of higher level of education constitutes a bottleneck, it cannot easily be substituted by increasing the GDP of the region. Therefore, the value of each indicator of a sub-index is penalized by linking it to the score of the indicator with the weakest performance.

As the notion of constraints is also present in the institutional literature, bottleneck characterizes the binding constraint; the weakest indicator as compared to other indicators of the sub-index. It is represented by the weakest value within a given set of index components.

Technically, the equation below describes the methodology:

$$X_{i,j} = \min Y_i(j) + \ln (1 + Y_{i,j} - \min Y_i(j))$$

Where  $X_{i,j}$  is the modified value, after penalty value of the indicator  $j$  of state  $i$

$Y_{i,j}$  is the normalized value of the original indicator  $j$  of state  $i$

$i = 1, 2 \dots m$ , (the number of states)

$j = 1, 2 \dots n$  (the number of institutional indicators)

For example, if there are three indicators of a sub-index and have the respective values as: (i) 0.7, (ii) 0.5 and (iii) 0.3, then the penalized values of the indicators will be (i) 0.636472, (ii) 0.482322 and (iii) 0.3 respectively. The largest potential difference between two indicators can be 1 when a particular state has the highest value in one indicator (one) and the lowest values in another (zero). In this case, the natural logarithm of 2 = 0.693, so the maximum penalty is  $1 - 0.693 = 0.307$ .

Stable and efficient sub-indices are those that are balanced in all indicators. If every state has similar differences in terms of the characteristics, then the rank order does not change significantly, but if one state is very unbalanced compared with others, then a lower rank for that state is expected in the PFB based index. Unlike the simple average index, the states would be penalized more for its weaknesses and its overall index score would be represented as weaker than average. It is claimed that PFB methodology is theoretically better than the arithmetic average calculation (Acs et.al, 2015).

In this study scores and values of indices are provided on the basis of both the simple average method and the PFB methodology and compared throughout.

### **3.3 Institutional Quality Index**

Out of the several variables mentioned in chapter two during the review of the literature, some variables could not be included in the composition of the institution quality index because of the constraints of the availability of the data and lack of appropriate proxies. Consequently, the composite index of institutional quality, which attempts to capture institutions and institutional environment for entrepreneurs across the Indian states, is sub-divided into three categorical sub-indices: (1) Index of Opportunity, (2) Index of Availability and (3) Index of Security. These three areas of sub-division: opportunity, availability, and security are the main components of the institutional quality in this study, which capture some important dimensions of the environment for entrepreneurship.

These indices compare Indian states at the specified dimensions and therefore, are relative in sense and do not tell how 'good' are institutions or institutional environment of one state from the other in an absolute sense. However, they (sub-indices) are expected to be valuable in terms of the detailed understanding of the institutional environment differences across the states.

All the three categorical sub-indices: 1) Index of Opportunity, (2) Index of Availability and (3) Index of Security are discussed below in detail.

#### **3.3.1 Index of Opportunity**

The perception of opportunity and its recognition by the entrepreneurs is a key to entrepreneurial actions. Acs and Szerb (2010) mentioned that the opportunity perception potential is essential to recognize and explore novel business opportunities. The region with better opportunities attracts the investors and induces them to start a business. Thus,

the Index of opportunity tries to enumerate the environment in which the entrepreneurs perceive the opportunity for them and is captured in terms of the market size differences across the various states of India.

The development of entrepreneurship in a particular state or region depends upon the size of the market available for the various entrepreneurial activities. There should not be any doubt that a larger market size creates new market niches and provide more opportunities for the entrepreneurs. Acs and Szerb (2010) have explained the size of the market in their GEDI as a combined measure of the domestic market size (in terms of GDP or income) and the urbanisation of a region. A higher per capita income indicates the higher purchasing power of a region and urbanisation implies a diversified demand structure. Both these variables collectively offer a flexibility of the diversity of activities for the entrepreneurs. These two variables (GDP and Urbanisation) are multiplied with each other to measure the agglomeration effect on the opportunity perception of entrepreneurs which demonstrate the combined and conditional effects (Acs and Szerb, 2010). The multiplication captures the idea that both the higher income and higher percentage of urbanisation are required for the better perception of entrepreneurial opportunities. It also avoids the dominance of any one indicator (income or urbanisation) on the sub-index.

The variable 'Per Capita Net State Domestic Product' has been used as a proxy for the purchasing power of the states in this index and the urbanisation of a particular state is measured in terms of the 'Percentage of the Urban Population in the Total Population'. Both the variables are multiplied together to collectively represent the size of the market across the states. The figures of Per Capita Net State Domestic Product are collected from the source of the Central Statistics Office (CSO) of India. The source of the data for urbanisation is the Ministry of Statistics and Programme Implementation of India.

Census in India, which provides the information regarding the urbanisation of the states, is conducted after every ten years. Hence, the figures for the year 2013-14 have been worked out by extrapolation of 2001 and 2011 Census data.

The per capita income of the states have been converted into the percentage of the total of all the 28 states and multiplied with the percentage of the urbanisation. The values obtained after the multiplication are normalised to 0 to 1 to get the market size scores, and ranks have been provided accordingly. The Market sizes of the various Indian states are shown in Table 3.1.

States having a relatively larger market size are Goa, Kerala, Maharashtra, Tamil Nadu, Gujarat and Haryana. These states have comparatively higher levels of per capita Net State Domestic Product (NSDP) and a higher percentage of urbanisation. On the other side, there are also some states like Sikkim and Mizoram, which have a larger size of the market but with unbalanced indicators. For example, Sikkim is a state with very high purchasing power in terms of per capita NSDP (rank 2) but has a low level of urbanisation, that is, below 30 percent. Similarly, Mizoram is a highly urbanised State (52%) but with lower per capita income.

Bihar, Assam, Odisha, Uttar Pradesh and Himachal Pradesh are the states with a comparatively smaller size of the market for the entrepreneurs. These states have a lower NSDP per capita and lower percentage of the urbanisation except Himachal Pradesh. The smaller market size in Himachal Pradesh is mainly due to its low urbanisation; the state has a comparatively higher level of per capita NSDP and ranks 9th among the 28 states of India, but has the lowest percentage of the urban population in the total population.

**Table 3.1****Index of opportunity (2013-14)**

Sl. no	State	Per capita NSDP at constant (2004-05) prices in (Rs)*	Rank	Urbanisation (%) **	Rank	Market size = Normalised score of (NSDP X Urbanisation)	Rank
1	Andhra Pradesh	42170	14	35.347	10	0.147776	13
2	Arunachal Pradesh	36019	18	23.246	22	0.074164	17
3	Assam	23392	26	14.434	26	0.017862	27
4	Bihar	15506	28	11.552	27	0	28
5	Chhattisgarh	28373	22	24.185	21	0.057138	23
6	Goa	137401	1	65.893	1	1	1
7	Gujarat	63168	5	44.146	6	0.294039	5
8	Haryana	67260	4	36.551	9	0.256833	6
9	Himachal Pradesh	54494	9	10.112	28	0.041908	24
10	Jammu and Kashmir	31448	20	27.93	18	0.078789	16
11	Jharkhand	28882	21	24.593	20	0.059853	22
12	Karnataka	46012	13	39.944	7	0.186913	11
13	Kerala	58961	8	54.248	2	0.340226	2
14	Madhya Pradesh	26853	23	27.981	17	0.064482	21
15	Maharashtra	69097	3	46.07	5	0.338513	3
16	Manipur	24042	25	31.74	14	0.065803	19
17	Meghalaya	37154	16	20.23	24	0.064509	20
18	Mizoram	41094	15	52.074	3	0.220945	8
19	Nagaland	49963	10	32.492	12	0.162742	12
20	Odisha	24929	24	17.187	25	0.028096	26
21	Punjab	49529	11	38.561	8	0.195024	9
22	Rajasthan	31836	19	25.34	19	0.070719	18
23	Sikkim	83527	2	29.14	15	0.254079	7
24	Tamil Nadu	62361	6	49.773	4	0.329565	4
25	Tripura	47261	12	28.916	16	0.133806	14
26	Uttarakhand	59161	7	32.014	13	0.193232	10
27	Uttar Pradesh	19233	27	22.73	23	0.029077	25
28	West Bengal	36293	17	33.066	11	0.115041	15

Source:\* Central Statistics Office (CSO)\*\*Selected Socio-Economic Statistics India, 2011 Available at: [www.mospi.gov.in](http://www.mospi.gov.in) and :<http://niti.gov.in>

The three states, Sikkim, Mizoram and Himachal Pradesh, with unbalanced indicators have one common feature, that is, all of them are small and hilly states located in the mountain region. But unlike Sikkim and Himachal Pradesh, which are low urbanised states, Mizoram is a state having 52 percent of the population living in urban regions.

Therefore, it is very difficult to conclude anything regarding the unbalanced market size

indicators of these states, specifically related to their geography. The index of opportunity takes care of such discrepancies as the multiplication of the two indicators (per capita NSDP and Urbanisation) inhibits the unevenness and demonstrates the conditional and combined effect.

### **3.3.2 Index of Availability**

Index of availability is a sub-index of the Institutional Quality Index in this study, which captures the accessibility of the population to the credit, information and higher education. While the availability of these factors acts as an efficiency enhancer for the entrepreneurship, shortages may constrain entrepreneurial activities.

Adequate level of education, credit and information collectively provide start up motives and enhances the efficiency of a region. It stimulates the people to develop entrepreneurial activities. Entrepreneurs may not be able to grab the opportunities if they lack the access to the sufficient amount of credit, adequate information and required skills. Easier and better access to the credit, information and education enable the entrepreneurs to act over the various opportunities they recognise for the purpose of earning profits. The availability of these factors may also equip the population with skills and entrepreneurial talents.

States are compared in terms of availability of these three factors: Credit, Information and Higher Education, which are crucial for the development of entrepreneurship in any region. These determinants of institutional environment for the entrepreneurship are discussed below in detail.

## **Credit**

Credit is one of the basic requirements of any entrepreneurial activities and studies have considered access to finance or credit as one important element of the institutional environment for the entrepreneurship. This study uses 'Credit-Deposit ratio' of the commercial banks to capture the variation of the credit environment across the Indian states. Scheduled commercial banks are of course not the only source of credit in any state, but it may capture a significant portion of the credit delivery system.

The 2004-05 report of the Reserve Bank of India on the trend and progress of banking in India mentions that the credit-deposit ratio of the commercial banks across the states has traditionally been used as a credit-efficiency indicator and is regarded as an aggregate measure for gauging the effectiveness of the credit delivery system (as cited in Dash and Raja, 2009).

Credit-deposit ratio, popularly CD ratio, is the ratio of how much a bank lends out the deposits it has mobilised. It explains the credit and risk environment of the states. A very low ratio indicates that people have lower access to the credit and banks are not making full use of their resources. There is a possibility that banks are not efficient enough in delivering the credit. A low CD ratio is also the indication of riskier credit environment where the banks feel it risky to lend loans. There may be a lack of demand for the credit from the people themselves. In any of such cases, the lower credit deposit ratio indicates weaker credit environment. Therefore, a low CD ratio simulates a weaker credit environment and lesser availability of the credit. The credit environment index of the various Indian states is provided in Table 3.2.

**Table 3.2****Credit Environment**

Sl. no	State	Credit-Deposit (C-D) Ratio (2013-14)	Rank
1	Andhra Pradesh	111.3	2
2	Arunachal Pradesh	23.7	27
3	Assam	37.7	17
4	Bihar	32.8	21
5	Chhattisgarh	59.45	12
6	Goa	28.67	24
7	Gujarat	74.7	7
8	Haryana	78.05	6
9	Himachal Pradesh	35.77	18
10	Jammu and Kashmir	40.14	15
11	Jharkhand	31.78	23
12	Karnataka	71.04	8
13	Kerala	67.67	9
14	Madhya Pradesh	60.37	11
15	Maharashtra	89.76	3
16	Manipur	33.6	20
17	Meghalaya	27.4	25
18	Mizoram	37.84	16
19	Nagaland	17.72	28
20	Odisha	44.55	14
21	Punjab	79.12	5
22	Rajasthan	87.12	4
23	Sikkim	26.47	26
24	Tamil Nadu	121.75	1
25	Tripura	32.4	22
26	Uttarakhand	35.64	19
27	Uttar Pradesh	44.6	13
28	West Bengal	61.6	10
	<b>India</b>	<b>78.9</b>	-

Source: RBI, India

The table (Table 3.2) clearly depicts the vast differences in the credit environment in India across its various states and finds that the differences of credit deposit ratio across the states are significant.

The credit-deposit ratio of the scheduled commercial banks varies widely across the Indian states. There are some states like Tamil Nadu and Andhra Pradesh having a CD

ratio greater than 100. On the other hand, there are also some states like Arunachal Pradesh and Nagaland with CD ratio less than 25. Goa is one such state, which is considered among developed states of India, but has a CD ratio below 30. Credit availability from the scheduled commercial banks is very less in many states, including Goa as the CD ratio is below 40 in almost 13 states. There are only five states (Andhra Pradesh, Maharashtra, Punjab, Rajasthan and Tamil Nadu) which have a Credit Deposit ratio higher than the all India level (78.9).

### **Education**

The level of education determines the quality of human capital of a region. There is a requirement of education and skills for many entrepreneurial activities. A region having a higher general level of education has more skilled people and therefore, there are possibilities of more number of entrepreneurs. Bruce and Deskins (2010) find that the U.S. states in which a larger share of the adult population holds a college degree tend to have higher rates of tax-based entrepreneurship. Tertiary level of education equips the people with many skills and induces them for entrepreneurship. Therefore, tertiary level of education has a specific role in the determination of an environment of a region or states for the development of entrepreneurship.

It is very difficult to measure the quality of education across the regions. Therefore, Gross Enrolment Ratio (GER) in tertiary or higher education is widely used to show the general level of participation in and capacity of higher education. Many studies such as Global Entrepreneurship Monitor (GEM) report 2011 (GERA, 2011) and Global Entrepreneurship Development Index (GEDI) by Acs and Szerb (2010) have used gross enrolment ratio (GER) in tertiary education in order to measure the education related institutional differences of countries in the context of entrepreneurship. Therefore, this

study also uses the variable ‘Gross Enrolment Ratio in Higher Education (18-23 Years)’ to understand the differences in terms of availability of higher education across the states of India. The ratio is expected to give an idea about the availability of education to the people as well as the efficiency of higher education system in the states. The GER of various Indian states is reported in table 3.3. The source of the variable GER is the all India surveys of higher education by the department of higher education of the Ministry of Human Resource Department (MHRD), Government of India.

**Table 3.3: Gross Enrolment Ratio in Higher Education (18-23 Years)**

Sl. no	State	2013-14	Rank
1	Andhra Pradesh	30.8	4
2	Arunachal Pradesh	26.1	11
3	Assam	15.8	23
4	Bihar	13.0	28
5	Chhattisgarh	14.0	26
6	Goa	26.4	8
7	Gujarat	19.5	19
8	Haryana	27.5	7
9	Himachal Pradesh	29.3	5
10	Jammu and Kashmir	25.6	12
11	Jharkhand	13.1	27
12	Karnataka	26.2	10
13	Kerala	24.9	14
14	Madhya Pradesh	19.6	18
15	Maharashtra	26.3	9
16	Manipur	37.7	2
17	Meghalaya	19.3	20
18	Mizoram	23.2	15
19	Nagaland	15.4	24
20	Odisha	16.4	21
21	Punjab	25.4	13
22	Rajasthan	19.7	17
23	Sikkim	27.8	6
24	Tamil Nadu	43.0	1
25	Tripura	15.4	24
26	Uttarakhand	33.8	3
27	Uttar Pradesh	21.6	16
28	West Bengal	16.3	22
	<b>All India</b>	<b>23.0</b>	
Source: All India Survey on Higher Education (2013-14), Department of Higher Education, Government of India, MHRD, 2015			

Tamil Nadu has the highest GER in higher education (43). While Manipur, Uttarakhand and Andhra Pradesh have a GER greater than 30, the condition of higher education is worse in some states like Bihar, Jharkhand, Chhattisgarh, Nagaland, Tripura and Assam where the GER in higher education is below 16. All India average of GER in tertiary education is 23 and there are 13 states having the values less than this average.

### **Information**

The availability of information to a larger section of the population and accessibility to more and new information is one of the important mechanisms through which the entrepreneurship of a region may progress. It enhances the efficiency and reduces the transaction costs involved in entrepreneurial activities. Shane and Venkataraman (2000) point out that the availability of information influences the ability to recognise opportunities. Therefore, information is required for opportunity recognition and continuous improvement of entrepreneurship in any region.

There is not a single source of information in any region or country and consequently, the availability of information in a particular country or region can't be appraised accurately. It can only be captured to some extent with the help of some proxy or proxies. One of such proxies is broadband, which is seen to be conducive to entrepreneurial activities because it facilitates the access to information and stimulates innovation activities (Audretsch, Heger and Veith, 2015). Through the internet, people are accessible to more and relevant information and also to some extent information according to their need and comfort. Therefore, the variable 'percentages of households having a computer/laptop with internet' can be used as a proxy to measure the difference of information availability across the states of India as data are available for this variable from a reliable source, that is, Census of India, 2011. But, in developing countries like

India the accessibility to computer and internet is limited. In that case, television can be another appropriate proxy in terms of its accessibility and popularity. But both the television and computer are electricity based devices and there is a possibility of differences regarding the electricity availability across the states. One other popular medium in India is Radio or Transistor. The programmes on television and radio are available in many languages and they are comparatively more popular and accessible means of information and communication. Due to some geographical reasons, the internet connectivity may differ across the states, but the television and radio are comparatively more evenly scattered across the country. Thus, the variable 'percentage of households having a computer/laptop with internet' is supplemented by two other variables: 'percentage of households having television' and 'percentage of households having radio/transistor'. More sources of information may provide more and better information than having one source of information.

Hence, similar to the measurement of the total market size in the index of opportunity, all the three variables (percentage of households having a computer/laptop with internet  $\times$  percentage of households having television  $\times$  percentage of households having radio/transistor) are multiplied together to get the final indicator of the information availability in the states. The multiplication demonstrates the combined effects of all the sources of information and also avoids the dominance of any one indicator. The values obtained after multiplication are normalised to 0 to 1. All the three variables/proxies collectively capture the availability of information across the Indian states in the sub-index 'Index of Availability'.

Some state may have a higher percentage of households with radio and television, but a lower percentage of households having a computer/laptop with internet facility. Similarly, there are also possibilities of states with higher percentage of households having a computer/laptop with internet facility, but a lower percentage of households with televisions and radio. In any of such cases, the multiplication of the variables may check and balance the discrepancies if any among the states due to geographical and other such factors.

The data related to the sources of information are given in the form of Table 3.4.

Since the data regarding the households having various sources of information are available from the census of India, which is conducted after every ten years, the information in the table is based on the Census 2011.

States such as Goa, Kerala and Tamil Nadu, where there are comparatively more number of households having electricity based sources (Computer and television), also have a larger number of households with radio/ transistor than the national average.

On the other side, there are some states like Bihar and Assam, which have a smaller number of households with television and internet but larger number of households having radio/transistor. There are also some states like Tripura, West Bengal, Odisha, Chhattisgarh and Jharkhand where the availability of information from all the three sources is below the national average.

**Table 3.4: Households having Sources of Information**

Sl. no	State	2011-12				
		HH having Television (%)	HH having computer/laptop with internet (%)	HH having Radio/ Transistor (%)	Normalised score of (c×d×e)	Rank
a	b	c	d	e	f	g
1	Andhra Pradesh	58.8	2.6	9.3	0.03423508	18
2	Arunachal Pradesh	41.1	2	22	0.04643295	15
3	Assam	27.5	1.6	22.1	0.0200568	22
4	Bihar	14.5	0.9	25.8	0	28
5	Chhattisgarh	31.3	1.2	11	0.00241265	27
6	Goa	81.1	12.7	31.1	1	1
7	Gujarat	53.8	3.1	19.4	0.09145945	13
8	Haryana	67.9	5.3	17.4	0.18693727	8
9	Himachal Pradesh	74.4	2.8	25.7	0.15829228	10
10	Jammu and Kashmir	51	2.9	47.2	0.20962645	5
11	Jharkhand	26.8	1.5	17.5	0.01157298	23
12	Karnataka	60	4.8	22.3	0.19200622	7
13	Kerala	76.8	6.3	29.7	0.44275721	2
14	Madhya Pradesh	32.1	1.4	14.5	0.00993646	24
15	Maharashtra	56.8	5.8	19.5	0.19205922	6
16	Manipur	47.4	2.2	54.4	0.16835709	9
17	Meghalaya	33.7	1.5	25.2	0.02956803	20
18	Mizoram	55.1	2.5	33.5	0.1349703	11
19	Nagaland	37.9	1.7	25	0.04019702	16
20	Odisha	26.7	1.4	11.4	0.00282192	26
21	Punjab	82.6	5.4	16.5	0.22157708	4
22	Rajasthan	37.6	1.8	16.2	0.02396961	21
23	Sikkim	54.7	3.3	23	0.12036581	12
24	Tamil Nadu	87	4.2	22.7	0.25107413	3
25	Tripura	44.9	1	12.8	0.00750993	25
26	Uttarakhand	62	3.2	14.6	0.08076729	14
27	Uttar Pradesh	33.2	1.9	24.7	0.03853514	17
28	West Bengal	35.3	2.2	18.3	0.03421596	19
	<b>India</b>	<b>47.2</b>	<b>3.1</b>	<b>19.9</b>		

Source: Data-book for Use of Deputy chairman, Planning Commission, Government of India, 10th March 2014(based on census 2011). Available at: <http://planningcommission.gov.in>

Finally, the sub- index ‘Index of Availability’ is composed of aggregation of these three institutional factors (Credit, Education and Information). The simple average index of availability is calculated as the average of the normalised scores of all these elements:

$$\text{Index of Availability} = \frac{\text{Norm Credit} + \text{Norm Edu} + \text{Norm Inf}}{3}$$

Where,

Norm Credit = Normalised score (0-1) of Credit-Deposit Ratio

Norm Edu = Normalised score (0-1) of Gross Enrolment Ratio in Higher Education  
(18-23 Years)

Norm Inf = Normalised score (0-1) of the percentage of (households having Television  
× households having computer/ laptop with internet × households having Radio/  
Transistor)

In table 3.5, simple average index of availability is the arithmetic mean of the normalised score of all the three indicators: credit, education and information. Whereas, PFB index of availability is the arithmetic mean of the PFB adjusted indicators (credit, education and information).

The higher score of the sub-index ‘Index of Availability’ implies the better availability of the credit, higher education, and information in the state on an average in comparison to those states which have comparatively lower scores. It means a better institutional environment in terms of availability which is conducive for the entrepreneurship development. On the other side, lower scores indicate the presence of constraints such as lack of skilled and educated personnel, shortage of necessary and relevant information and difficulties in access to credit, which collectively create a gloomy and discouraging environment for both the entrepreneurs and the population at large. People in these

regions may be more interested in securing their livelihood rather than to engage in any entrepreneurial activities, as they have lower or no access to any form of credit, skill and information.

**Table 3.5: Index of Availability (2013-14)**

Sl. no	State	Simple average index of availability	Rank	PFB adjusted index of availability	Rank
1	Andhra Pradesh	0.509038875	3	0.390080575	5
2	Arunachal Pradesh	0.180194345	20	0.159920199	20
3	Assam	0.101816727	24	0.096533689	24
4	Bihar	0.048319395	27	0.045122706	27
5	Chhattisgarh	0.145626759	21	0.124416346	21
6	Goa	0.517308224	2	0.416192345	3
7	Gujarat	0.285284244	13	0.256073932	13
8	Haryana	0.416733159	6	0.383951165	7
9	Himachal Pradesh	0.291711085	12	0.271902436	11
10	Jammu and Kashmir	0.281713735	14	0.275226446	10
11	Jharkhand	0.050019878	26	0.047344263	26
12	Karnataka	0.381516892	8	0.358532	8
13	Kerala	0.439857944	5	0.438413694	2
14	Madhya Pradesh	0.213304785	17	0.185661291	17
15	Maharashtra	0.442628368	4	0.402031273	4
16	Manipur	0.381446233	9	0.328921726	9
17	Meghalaya	0.110872704	23	0.105377671	23
18	Mizoram	0.222792017	16	0.216068958	15
19	Nagaland	0.040065675	28	0.038790395	28
20	Odisha	0.124687211	22	0.113496432	22
21	Punjab	0.408374927	7	0.384658278	6
22	Rajasthan	0.304806067	11	0.250104239	14
23	Sikkim	0.232603164	15	0.210327703	16
24	Tamil Nadu	0.750358044	1	0.623741967	1
25	Tripura	0.076207689	25	0.072638052	25
26	Uttarakhand	0.315452876	10	0.269224284	12
27	Uttar Pradesh	0.194529604	18	0.178660817	18
28	West Bengal	0.188672456	19	0.16775426	19

Note: The values obtained in the table are through authors' own calculation

As has been claimed by the PFB methodology, the rank order of the states does not change too much if they have similar differences in terms of the characteristics, but a lower rank is observed for the states in the PFB based index which are very unbalanced compared with the others. For example, the comparative position of Andhra Pradesh

lowered down in the PFB adjusted index because it has unbalanced indicators. It has a very high CD ratio (2<sup>nd</sup> rank) and higher GER in higher education (4<sup>th</sup> rank) but its position and ranking is low in terms of the availability of the information (18<sup>th</sup> rank). Similarly, in the case of Kerala, the ranking improves significantly from the 5<sup>th</sup> position to the 2<sup>nd</sup> in the PFB index as the state has more balanced indicators.

Tamil Nadu, Kerala, Goa, Maharashtra and Haryana are the leading states which perform better in terms of the availability. In these states people have better accessibility to higher education, credit and information in comparison to other states. On the other side, Nagaland, Bihar, Jharkhand, Tripura and Assam are the states with poor performances in terms of the availability of these factors. These states have lower credit-deposit ratio and Gross Enrolment Ratio in higher education, as well as a less percentage of households have access to information sources like radio, television and internet in these states.

Though these elements do not capture the whole environment of availability for the entrepreneurship development, but to some extent, they provide the idea of credit environment, environment of education and the accessibility of population to information in a particular state. The 'Index of Availability' captures the institutional environment of the states in terms of the availability of resources through which entrepreneurs may be able to implement their ideas once they recognize the opportunities. The non-availability of these factors may constrain the entrepreneurship development even though there are possible opportunities. The PFB adjusted sub-index takes care of the imbalances of all the three pillar indicators. It penalizes the various variables and lowers down the overall score in comparison to the simple average index.

### 3.3.3 Index of Security

Institutional economics literatures have given much importance to the security of life and property rights in encouraging investment and innovation. The Index of security in this study measures the level of security of lives and property against physical and economic offences across the states. It signifies the level of safety in the region. The source of the sub-index is the National Crime Records Bureau (NCRB) of the Ministry of Home Affairs, Government of India. The following indicators/variables have been used for the purpose of capturing the dimensions of security in this study:

- a) *Inverse of the Crime Rate of the Crimes against Body*: The crimes under this category are mainly physical offences including murder, attempt to murder, kidnapping and abduction and Hurt, etc. A crime rate is defined as the number of offences per 100,000 (one lakh) populations in the NCRB. Therefore, the inverse of the variable is considered to relate to lower rate of crimes against the body as the better security environment.
- b) *Inverse of the Rate of the Crimes against property*: This variable considers the crimes against private property. The crimes included under this category are such as Dacoity, Robbery, Burglary and Theft, etc. The inverse of this ratio is considered, as the lower rate of the crimes against property is indicative of the better protection of property.
- c) *Inverse of the Rate of the Economic Crimes*: Economic offenses such as a criminal breach of trust, frauds, cheating and Counterfeiting etc. are considered under this category. The inverse of the variable is considered, as lower incidence of economic offenses is indicative of better protection of the property rights and a better environment in terms of the trusts.

**d) *Inverse of the Rate of the Crimes against public order:*** Crimes such as Riots and Arson induce a sense of insecurity and fear in the community. It disturbs the public order of life and peace in the society. The lower rate of such crimes in a particular society is a better indication of the security environment.

Along with the lower rate of the crimes, the efficiency and quality of legal structure and justice mechanism which enforces the law and takes care of the violation against the law is also an important factor for the security of lives and property rights. Subramanian (2007) refers that outcomes are determined by the quality of institutions. Therefore, some indicators related to the efficiency of the legal structure and the qualities of the justice mechanism have also been included to present an overview of the environment of security across the states. Indicators/Variables considered regarding this are as follows:

- a) *Inverse of the Pendency Percentage of IPC Cases by Police:*** It signifies the percentage of cases pending under the investigations by the police to the total cases registered for investigation by them. The inverse of the variable is considered so that a higher value can indicate lower pendency of investigations and therefore better efficiency of the law enforcement in a particular state.
- b) *Inverse of the Pendency Percentage of IPC Cases by Courts:*** This is the ratio of the cases in which trials are not completed by the courts to the total cases undergoing trial by courts. The inverse of the ratio is considered as a higher value indicates lower pendency of cases and better efficiency of the institution judiciary.
- c) *Recovery Percentage of the Stolen Property:*** This is the percentage of the total value of property recovered by police or other means to the total value of property stolen in a particular state. A higher value of this variable denotes efficiency of law enforcing agencies in protecting property.

Table 3.6 provides detailed information of the rate of the crimes across the Indian states.

**Table 3.6: Crime situation in Indian states (Crime rate)**

Sl. No.	State	Crime against body				Crime against property				Economic crimes			
		2013	2014	Average	Rank	2013	2014	Average	Rank	2013	2014	Average	Rank
1	Andhra Pradesh	93.84	52.4	73.12	5	48.21	40.9	44.555	10	17.13	12.5	14.815	4
2	Arunachal Pradesh	68.84	55.8	62.32	7	63.5	61.7	62.6	5	7.61	11.7	9.655	12
3	Assam	57.32	64.8	61.06	8	50.83	59.8	55.315	6	13.08	15.9	14.49	5
4	Bihar	52.69	41.2	46.94	15	27.56	29.2	28.38	17	6.4	7.5	6.95	21
5	Chhattisgarh	70.35	76.6	73.47	4	36.45	38.7	37.575	14	4.6	4.7	4.65	25
6	Goa	39.68	61.7	50.69	12	83.34	81.4	82.37	3	16.45	19	17.725	2
7	Gujarat	33.24	72.8	53.02	11	36.21	33	34.605	16	4.34	4.8	4.57	26
8	Haryana	45.46	64.8	55.13	10	97.57	105	101.285	2	10.45	12.7	11.575	8
9	Himachal Pradesh	32.97	60.2	46.58	16	25.62	22.2	23.91	25	8.92	8.1	8.51	14
10	Jammu and Kashmir	19.61	62.7	41.15	21	27.71	26.5	27.105	21	6.39	5.2	5.795	24
11	Jharkhand	35.54	30.8	33.17	23	27.71	28.2	27.955	20	10.68	9.1	9.89	10
12	Karnataka	45.26	80.1	62.68	6	47.19	49.3	48.245	9	11.74	12.7	12.22	7
13	Kerala	62.6	331.1	196.8	1	23.12	26	24.56	24	14.98	18.9	16.94	3
14	Madhya Pradesh	68.66	96.9	82.78	3	51	57.4	54.2	7	2.88	3.6	3.24	28
15	Maharashtra	44.02	48	46.01	18	70.43	71.5	70.965	4	10.9	11.4	11.15	9
16	Manipur	28.38	60.3	44.34	19	42.85	42.6	42.725	11	7.87	6.7	7.285	18
17	Meghalaya	31.2	31.5	31.35	24	34.32	42.5	38.41	12	8.84	10.4	9.62	13
18	Mizoram	16.86	25.2	21.03	27	99.22	128.1	113.66	1	7.56	8.7	8.13	15
19	Nagaland	12.29	9	10.645	28	21.39	22.2	21.795	26	3.33	3.7	3.515	27
20	Odisha	50.08	51.3	50.69	12	38.56	38	38.28	13	6.28	6.7	6.49	23
21	Punjab	36.33	39.5	37.91	22	27.8	28.8	28.3	18	14.57	14.2	14.385	6
22	Rajasthan	50.69	48.5	49.59	14	51.07	51.8	51.435	8	33.39	36.8	35.095	1
23	Sikkim	35.14	49.5	42.32	20	33.86	39.6	36.73	15	5.09	9	7.045	20
24	Tamil Nadu	62.4	110	86.2	2	28.36	28.2	28.28	19	7.61	7.4	7.505	16
25	Tripura	49.57	62.1	55.83	9	21.81	16.9	19.355	28	7.32	5.8	6.56	22
26	Uttarakhand	29.52	24	26.76	26	19.53	21.5	20.515	27	7.08	7.1	7.09	19
27	Uttar Pradesh	23.69	32.4	28.045	25	25.32	28.1	26.71	22	7.63	7.2	7.415	17
28	West Bengal	36.09	56.8	46.44	17	27.68	25.6	26.64	23	8.86	10.5	9.68	11

Source: National Crime Records Bureau of the Ministry of Home Affairs, Government of India (2013 & 2014)

Kerala, Tamil Nadu, Madhya Pradesh, Chhattisgarh and Andhra Pradesh have comparatively higher reporting of the crime against the body and thereby higher crime rate. On the other side, Mizoram, Haryana, Goa, Maharashtra, Arunachal Pradesh and Assam are the states having a comparatively higher rate of the crimes against property. While, economic crimes are comparatively higher in the states like Rajasthan, Goa,

Kerala, Andhra Pradesh and Assam, states such as Kerala, Jammu and Kashmir, Sikkim, Bihar, Karnataka and Assam have more cases of crime against public order.

In table 3.7, detail of the information regarding the legal efficiencies of the states is provided.

**Table 3.7: Crime situation and legal efficiency in Indian states (2013-14)**

Sl. No.	State	Crime against public order		Stolen Property Recovery (%)		Case Pendency by Police (%)		Case Pendency by Courts (%)	
		Average	Rank	Average	Rank	Average	Rank	Average	Rank
1	Andhra Pradesh	3.165	23	47.65	3	32.91	10	70.5	24
2	Arunachal Pradesh	5.365	14	28	14	57.365	3	98.3	1
3	Assam	11.775	6	25.8	16	57.0567	4	82.85	13
4	Bihar	13.35	4	13.8	21	25.116	17	91.3	8
5	Chhattisgarh	4.525	19	19.8	19	10.741	26	78.5	17
6	Goa	9.755	7	8.8	25	52.182	5	85.8	10
7	Gujarat	3.16	24	22.6	18	11.156	25	91.85	6
8	Haryana	7.31	12	34.75	13	14.7	24	75.9	19
9	Himachal Pradesh	8.755	9	36.1	11	16.47	20	90.8	9
10	Jammu and Kashmir	14.925	2	46.7	4	31.456	13	79.5	16
11	Jharkhand	7.33	10	16.3	20	38.147	7	74.5	22
12	Karnataka	12.27	5	38.4	9	30.2	15	73.5	23
13	Kerala	24.73	1	8.55	26	15.46	22	82.05	14
14	Madhya Pradesh	3.435	22	35.35	15	7.18	28	75.7	21
15	Maharashtra	8.9	8	8.95	24	38.06	8	91.6	7
16	Manipur	4.935	16	5.1	28	85.97	1	97.25	3
17	Meghalaya	3.45	21	7.35	27	72.89	2	97.4	4
18	Mizoram	2.455	26	42.75	7	27.3	16	49.6	27
19	Nagaland	0.835	27	12.3	23	35.99	9	59.95	26
20	Odisha	5.58	13	13.4	22	30.38	14	91.95	5
21	Punjab	0.215	28	40.8	8	42.29	6	76.9	18
22	Rajasthan	4.83	17	52.25	2	7.616	27	83.4	12
23	Sikkim	13.655	3	44.9	6	19.89	18	39.8	28
24	Tamil Nadu	5.195	15	69.8	1	32.409	11	63.35	25
25	Tripura	4.775	18	27.9	15	15.737	21	75.85	20
26	Uttarakhand	4.01	20	46.25	5	16.71	19	79.6	15
27	Uttar Pradesh	3.125	25	37.45	10	15.37	23	85.2	11
28	West Bengal	7.33	10	24.95	17	31.67	12	96.2	4

Source: National Crime Records Bureau of the Ministry of Home Affairs, Government of India (2013 & 2014)

In case of legal efficiency, Police is performing comparatively better in Madhya Pradesh, Rajasthan, Chhattisgarh, Gujarat and Haryana as these states have comparatively lower pending cases for investigations by the police. In Tamil Nadu, Rajasthan, Andhra Pradesh, Jammu and Kashmir and Uttarakhand, there is a better recovery of the stolen property. Cases are comparatively less pendent with the courts in the state like, Sikkim, Mizoram, Nagaland, Tamil Nadu, Andhra Pradesh and Karnataka.

The vast differences of the states in terms of various crimes and legal efficiency indicators are well evident from the tables 3.6 and 3.7. There are some states like Kerala having a crime rate of 197, in terms of the physical crimes; on the other hand, there is a state like Nagaland having a crime rate of only eleven. Similarly, while in Tamil Nadu, there is about seventy percent recovery of the stolen property, in Manipur only five percent of the stolen property could be recovered.

Based on the above mentioned parameters, the security environment of the Indian states has been captured. Moreover, the average of two adjacent years may lessen the potential of using a single good or bad year. Therefore, the average of the normalised scores of all the seven variables is calculated separately for each year and then averaged out for the two subsequent years to remove a single year effect.

The index of security as reported in table 3.8 presents an average view of the security environment of the states. The normalised scores of all the seven variables have been averaged out by the arithmetic mean in the simple average index. PFB adjusted Index of Security is also calculated as an average of the PFB adjusted indicators which are computed on the basis of the PFB methodology. The table 3.8 is based on the average of the two years 2013 and 2014.

**Table 3.8: Index of Security: State Scores and Rankings (2013-14)**

Sl. no	State	Average Security Scores	Rank	PFB Scores	Rank
1	Andhra Pradesh	0.231782022	15	0.20161043	16
2	Arunachal Pradesh	0.136067867	25	0.120686615	26
3	Assam	0.134769856	26	0.12368952	25
4	Bihar	0.224800351	18	0.192232317	18
5	Chhattisgarh	0.311672149	13	0.227976072	14
6	Goa	0.082343139	28	0.078088741	28
7	Gujarat	0.327499064	11	0.275681147	10
8	Haryana	0.210261836	19	0.182417927	20
9	Himachal Pradesh	0.311108769	14	0.258372716	12
10	Jammu and Kashmir	0.347339171	8	0.280831508	9
11	Jharkhand	0.230101129	16	0.201751245	15
12	Karnataka	0.20861088	21	0.183655025	19
13	Kerala	0.209183505	20	0.172251375	22
14	Madhya Pradesh	0.424289806	2	0.331278913	4
15	Maharashtra	0.106809556	27	0.101042603	27
16	Manipur	0.144696035	24	0.125403907	24
17	Meghalaya	0.155348289	23	0.13734844	23
18	Mizoram	0.339569969	10	0.271823621	11
19	Nagaland	0.51324717	1	0.403609766	1
20	Odisha	0.193203271	22	0.172566638	21
21	Punjab	0.397246864	5	0.331669879	3
22	Rajasthan	0.319500786	12	0.247366156	13
23	Sikkim	0.403117154	4	0.323923044	5
24	Tamil Nadu	0.361176992	6	0.290207962	8
25	Tripura	0.356843969	7	0.293422527	7
26	Uttarakhand	0.404126138	3	0.333082848	2
27	Uttar Pradesh	0.346868229	9	0.299662387	6
28	West Bengal	0.226831806	17	0.194472841	17

Source: Authors' Own Calculation

Some hilly states like Nagaland, Uttarakhand and Sikkim, which are also less populated states, perform well in terms of the security environment. There are also some larger states (in terms of population) like Madhya Pradesh and Punjab, which have comparatively better scores and rankings.

Similarly, the states which have worse security environment such as, Goa, Maharashtra, Manipur, Arunachal Pradesh and Assam, are also a mixture of the larger and smaller

population sized states. Therefore, the population size of the state does not matter regarding the performances of the states in terms of their security environment.

In the PFB adjusted index of security, the position of the states does not change much. The rankings of the Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Punjab, Uttarakhand and Uttar Pradesh have improved, while the position of Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Haryana, Jammu and Kashmir, Kerala, Madhya Pradesh, Mizoram, Rajasthan, Sikkim, and Tamil Nadu has declined in the PFB index.

Some states with larger market size and better conditions of availability, like, Goa and Maharashtra have worse security environment. On the other hand, there are also some states like Uttarakhand and Punjab, which have better security environment as well as better market size and availability.

The index of security presents an average view of the security environment of the states and it is not essential that a state having higher/lower scores and rankings performs well/worse in terms of all the indicators of security. For example, Kerala has a very high percentage of crimes against the body and public order, but has a very low rate of the crimes against property. Similarly, Mizoram has the highest crime rate against property, but a low rate of the crimes against the body.

#### **3.3.4 Simple Average Institutional Quality Index**

There is a wide variation among the states in relation to the different mentioned areas. However, to get a picture of the overall environment all the indices need to be looked collectively, so that a common picture of the institutional quality or the environment of the states regarding entrepreneurship could be visualised. Therefore, an institutional quality index, which is an average of all the above mentioned sub-indices are calculated

for each state. This index is a composite index obtained by the aggregation of the sub-indices of each of areas with equal weights:

$$\text{Institutional Quality Index} = \frac{INDOPP + INDAVAIL + INDSEC}{3}$$

Where,

*IND OPP* = Index of Opportunity

*IND AVAIL* = Index of Availability

*IND SEC* = Index of Security

Different weighting techniques may yield different relative rankings of the states in terms of the institutional environment; therefore, equal weights are used to avoid such problems. The institutional quality index is the simple arithmetic mean of the sub-indices. The interstate variation of institutional environment for entrepreneurship is shown below in table 3.9 in the form of simple average institutional quality indices.

Top five leading states with higher institutional quality scores and rankings are Goa, Tamil Nadu, Punjab, Kerala and Uttarakhand. On the other side, Assam, Bihar, Meghalaya, Jharkhand and Odisha are the low performing states. Among the leading states Tamil Nadu, Kerala and Punjab have comparatively better performances in terms of availability than the other two specified areas. But unlike these states, Goa has the highest score of opportunity, but the lowest score of security. Uttarakhand which is a smaller and hilly state has a better security score.

Though the low performing states have worse performances in terms of all the considered areas, the scores of sub-index opportunity is lower than the other two, that is, availability and security. Jharkhand has a lower score in terms of the availability.

**Table 3.9****Average Institutional Quality of States (2013-14)**

Sl. No.	State	Index of Opportunity	Index of Availability	Index of Security	Simple Average Index	Rank
1	Andhra Pradesh	0.147776	0.509038875	0.231782022	0.296198852	8
2	Arunachal Pradesh	0.074164	0.180194345	0.136067867	0.130141974	23
3	Assam	0.017862	0.101816727	0.134769856	0.084816252	28
4	Bihar	0	0.048319395	0.224800351	0.091039915	27
5	Chhattisgarh	0.057138	0.145626759	0.311672149	0.171478948	22
6	Goa	1	0.517308224	0.082343139	0.533217121	1
7	Gujarat	0.294039	0.285284244	0.327499064	0.30227413	6
8	Haryana	0.256833	0.416733159	0.210261836	0.294609383	10
9	Himachal Pradesh	0.041908	0.291711085	0.311108769	0.214909144	17
10	Jammu and Kashmir	0.078789	0.281713735	0.347339171	0.235947453	14
11	Jharkhand	0.059853	0.050019878	0.230101129	0.113324653	25
12	Karnataka	0.186913	0.381516892	0.20861088	0.259013507	12
13	Kerala	0.340226	0.439857944	0.209183505	0.329755968	4
14	Madhya Pradesh	0.064482	0.213304785	0.424289806	0.234025402	15
15	Maharashtra	0.338513	0.442628368	0.106809556	0.29598357	9
16	Manipur	0.065803	0.381446233	0.144696035	0.197314966	18
17	Meghalaya	0.064509	0.110872704	0.155348289	0.110243447	26
18	Mizoram	0.220945	0.222792017	0.339569969	0.261102436	11
19	Nagaland	0.162742	0.040065675	0.51324717	0.238684887	13
20	Odisha	0.028096	0.124687211	0.193203271	0.115328837	24
21	Punjab	0.195024	0.408374927	0.397246864	0.333548672	3
22	Rajasthan	0.070719	0.304806067	0.319500786	0.231675235	16
23	Sikkim	0.254079	0.232603164	0.403117154	0.296599682	7
24	Tamil Nadu	0.329565	0.750358044	0.361176992	0.480366649	2
25	Tripura	0.133806	0.076207689	0.356843969	0.188952708	20
26	Uttarakhand	0.193232	0.315452876	0.404126138	0.304270248	5
27	Uttar Pradesh	0.029077	0.194529604	0.346868229	0.190158257	19
28	West Bengal	0.115041	0.188672456	0.226831806	0.176848336	21

Source: Author's Calculation

Thus, even within a state there are significant differences among the different areas (security, opportunity, availability). These differences are seen among the states irrespective of geography and location of the state. For example, though northeastern states have similar geography, the performances are quite different. While Nagaland and

Mizoram have higher scores in terms of security, Manipur has better performance in terms of the availability scores.

### **3.3.5 PFB Institutional Quality Index**

As there are imbalances of indicators within or across the states, the PFB Institutional Quality Index has been calculated as the average of the PFB adjusted sub-indices (Index of Opportunity, Index of Availability and Index of Security). The PFB scores and rankings of the Indian states have been reported in the form of Table 3.10. The table provides a general comparison of the PFB scores with the simple average index.

While, the position and ranking of some of the states remain unchanged in the PFB based indices, it has changed for many states in comparison to the simple average index. Though the changes are by one or two positions for most of the states, the rank of Haryana has improved significantly from 10<sup>th</sup> to 7<sup>th</sup> position. While its position is low (20<sup>th</sup>) in terms of the security scores, it scores 6<sup>th</sup> position in terms of availability and opportunity.

States whose positions have improved in the PFB index are Haryana, Assam, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala and Maharashtra.

Similarly, states which ranking has declined are Andhra Pradesh, Bihar, Madhya Pradesh, Mizoram, Nagaland, Punjab, Rajasthan, Sikkim, and Uttarakhand. The decline in the ranking and the positions of these states is due to imbalances among their indicators. For example, Uttarakhand score 3<sup>rd</sup> in terms of security, but 10<sup>th</sup> in terms of opportunity and availability.

**Table 3.10****PFB Institutional Quality Scores of States (2013-14)**

Sl. No.	State	Simple Average Index	Rank	PFB Index	Rank
1	Andhra Pradesh	0.296198852	8	0.246488888	10
2	Arunachal Pradesh	0.130141974	23	0.118256841	23
3	Assam	0.084816252	28	0.079361794	27
4	Bihar	0.091039915	27	0.079118341	28
5	Chhattisgarh	0.171478948	22	0.136510118	22
6	Goa	0.533217121	1	0.498093695	1
7	Gujarat	0.30227413	6	0.27526472	6
8	Haryana	0.294609383	10	0.274400749	7
9	Himachal Pradesh	0.214909144	17	0.190727576	16
10	Jammu and Kashmir	0.214909144	14	0.211615802	13
11	Jharkhand	0.113324653	25	0.10298282	25
12	Karnataka	0.259013507	12	0.243033176	11
13	Kerala	0.329755968	4	0.316963842	3
14	Madhya Pradesh	0.234025402	15	0.193807273	15
15	Maharashtra	0.29598357	9	0.280528887	5
16	Manipur	0.197314966	18	0.173376088	18
17	Meghalaya	0.110243447	26	0.10241182	26
18	Mizoram	0.261102436	11	0.2362793	12
19	Nagaland	0.238684887	13	0.201713992	14
20	Odisha	0.115328837	24	0.1047197	24
21	Punjab	0.333548672	3	0.303784127	4
22	Rajasthan	0.231675235	16	0.189396415	17
23	Sikkim	0.296599682	7	0.262776491	9
24	Tamil Nadu	0.480366649	2	0.414504947	2
25	Tripura	0.188952708	20	0.166622348	20
26	Uttarakhand	0.304270248	5	0.26517962	8
27	Uttar Pradesh	0.190158257	19	0.169133381	19
28	West Bengal	0.176848336	21	0.159089283	21
Source: The Values provided in the table are through authors' calculation					

### 3.4 Clustering of States

On the basis of the scores of the PFB adjusted Index of Institutional Quality, states are clustered (on the basis of k-median scores (L1 or absolute value)) into three cluster groups:

a) *Leading entrepreneurial states/regions* characterised by a relatively strong performance for many indicators of the sub-indices and have high institutional quality scores. The states under this cluster are supposed to be with a high level of income, urbanisation and education etc.

b) *Well performing states/regions*, reflecting average value in terms of their institutional quality scores and the average entrepreneurial climate of India. These states are neither leading nor low performing.

c) *Lagging entrepreneurial environment regions*: states under this cluster are mainly low performing states. These states have lower performances in terms of many indicators, if not in all.

The classifications of states under various clusters, as mentioned above are shown in the form of table 3.11. States having close institutional quality scores are clustered together in the same group.

**Table 3.11: States and their Institutional Environment**

States	Cluster
Goa, Tamil Nadu, Kerala, Punjab, Maharashtra, Gujarat, Haryana, Uttarakhand, Sikkim, Andhra Pradesh, Karnataka and Mizoram	Leading Regions
Jammu and Kashmir, Nagaland, Madhya Pradesh, Himachal Pradesh, Rajasthan, Manipur, Uttar Pradesh, Tripura and West Bengal	Well Performing Regions
Chhattisgarh, Arunachal Pradesh, Odisha, Jharkhand, Meghalaya, Assam and Bihar	Lagging Regions

### 3.5 Exploration of the Index

It is worthwhile to come across the relationship of the various sub-indices with the composite Institutional Quality Index. Correlation coefficients between the simple average Institutional Quality Index and the sub-indices as well as between the PFB Institutional Quality Index and the PFB adjusted sub-indices have been calculated for this purpose and reported in table 3.12 and 3.13 respectively.

**Table 3.12: Correlation coefficients between Simple Average Institutional Quality Index and the Sub-Indices**

	<u>Index of Security</u>	<u>Index of Opportunity</u>	<u>Index of Availability</u>	<u>Institutional Quality</u>
Index of Security	1.0000	-	-	-
Index of Opportunity	-0.2208 (0.259)	1.0000	-	-
Index of Availability	-0.1311 (0.506)	0.5734*** (0.0014)	1.0000	-
Institutional Quality	0.1417 (0.472)	0.8348*** (0.000)	0.8355*** (0.000)	1.0000

Note: \*\*\* indicates the significance level at ( $p < 0.01$ ), \*\* indicates the significance level at ( $p < 0.05$ ) and the values in the parentheses are p values

**Table 3.13: Correlation coefficients between PFB Institutional Quality Index and the Sub-Indices**

	<u>Index of Security</u>	<u>Index of Opportunity</u>	<u>Index of Availability</u>	<u>Institutional Quality</u>
Index of Security	1.0000	-	-	-
Index of Opportunity	-0.226 (0.246)	1.0000	-	-
Index of Availability	-0.123 (0.5326)	0.557*** (0.0021)	1.0000	-
Institutional Quality	0.0747 (0.7054)	0.8685*** (0.000)	0.8250*** (0.000)	1.0000

Note: \*\*\* indicates the significance level at ( $p < 0.01$ ), \*\* indicates the significance level at ( $p < 0.05$ ) and the values in the parentheses are p values

In all the cases, the sub-indexes show a positive relation with the composite institutional environment index. However, in case of the Index of Opportunity and Index of Availability the coefficients show significant and high correlations, the coefficient is small and insignificant in case of the index of security. Therefore, the security environment has comparatively weaker representation in the final composite index of the institutional environment. Even the sub-indices Index of Opportunity and Index of Availability are positively and significantly correlated to each other, while the Index of Security shows negative relation with the index of opportunity. The probable reason for this negative relation would be the higher payoff in the regions with higher opportunity scores. Thus, although it is not evident and conclusive, but it seems that security is comparatively weaker in those states which have more opportunity.

However, when the individual scores of leading regions are observed, we get a mixture of the states some having well security scores and some having worse. While Goa, Maharashtra, Kerala and Haryana have weaker security environment other leading states (Tamil Nadu, Uttarakhand, Punjab and Sikkim) have better rankings. Therefore, any such relations are not conclusive and clear.

There are no significant changes in the correlation coefficients and their signs from the simple average indices to the PFB institutional quality indices. Therefore, empirically both the indices seem similar but with different theoretical background. Of course, the PFB institutional quality index takes care of the extreme imbalances among indicators and therefore provides the final value lower than that of the simple average index. Hence, it is very difficult, at least in this case, to make any decisions regarding which index is better. However, the PFB indices are used for further analysis.

### **3.6 Institutional Quality in Different Time Periods (2006-07 and 2011-12)**

To observe the performances of the various states in terms of their institutional scores in different time periods and their comparative rankings, similar PFB indices have been calculated for two more time periods (2006-07 and 2011-12). In the year 2006-07, Government of India has taken a crucial step in the field of entrepreneurship development in the form of Micro, Small and Medium Enterprises Development (MSMED) act 2006. This act defines clearly the units that fall under micro, small and medium category and classified the service sector separately. The new reform policy with economic liberalisation and globalisation has nullified the protection that had been enjoyed by this sector and unfolded this sector for a competition. And the information on many variables, if not of all, is available till the year 2011-12; therefore both these years are selected.

The information about the sources of information in the sub-index, Index of Availability, are only available for 2011-12, therefore the values of this variable are kept identical for all the years for all the states to avoid any biases. The methodology has been kept same for all the states to ensure that the data are defined in the same way. The detailed information regarding the institutional environment scores of the Indian states for the entrepreneurship development is shown in table 3.14.

While the relative scores of the institutional environment is lower in year 2011-12 for some leading states like Goa and Tamil Nadu, their relative position is same (Goa (1<sup>st</sup>), Tamil Nadu (2<sup>nd</sup>)). At the same time some leading states such as Kerala, Sikkim and Uttarakhand show improvement in terms of their relative institutional environment scores and position. Thus, the scores do not measure the changes over time rather only the relative position of the states in different time periods.

**Table 3.14****Institutional Quality Scores (2006-07, 2011-12)**

Sl. No	State	2006-07		2011-12	
		Score	Rank	Score	Rank
1	Andhra Pradesh	0.287451204	8	0.24948427	9
2	Arunachal Pradesh	0.095349165	25	0.100846599	26
3	Assam	0.087103578	27	0.091697713	28
4	Bihar	0.042262472	28	0.093716807	27
5	Chhattisgarh	0.164722282	19	0.13944875	22
6	Goa	0.521687536	1	0.486600409	1
7	Gujarat	0.270842096	10	0.253865738	8
8	Haryana	0.292913423	6	0.283698911	6
9	Himachal Pradesh	0.19482139	16	0.174332372	17
10	Jammu and Kashmir	0.177065298	18	0.193984661	15
11	Jharkhand	0.092899747	26	0.121930528	25
12	Karnataka	0.292532	7	0.246959883	12
13	Kerala	0.279300755	9	0.314821605	3
14	Madhya Pradesh	0.239626742	12	0.192946483	16
15	Maharashtra	0.339806207	3	0.288160587	5
16	Manipur	0.13722531	23	0.154147805	21
17	Meghalaya	0.145049976	22	0.125241637	24
18	Mizoram	0.333542114	4	0.235234098	13
19	Nagaland	0.163162578	20	0.267718998	7
20	Odisha	0.146445372	21	0.133520069	23
21	Punjab	0.310836668	5	0.302756931	4
22	Rajasthan	0.266479001	11	0.206430952	14
23	Sikkim	0.220867144	13	0.24870905	11
24	Tamil Nadu	0.485719109	2	0.40638922	2
25	Tripura	0.117107764	24	0.156074967	20
26	Uttarakhand	0.214133852	14	0.248847807	10
27	Uttar Pradesh	0.210733019	15	0.173751591	18
28	West Bengal	0.185480764	17	0.164966246	19

### 3.7 Analysis and Conclusion

While the composite index (Index of Institutional Quality) gives an overview of the institutional environment of the states in the context of entrepreneurship, it is observed that while a state performs extremely well in certain indicators, its performances is not satisfactory in others. One cannot say that states with higher average institutional quality scores perform better in all respects than that of states with lower average institutional quality scores. Every region or states has its own strengths and weaknesses. Of course, there are some states having worse performances in almost all indicators, but that is not correct in the case of many states. Therefore, indexes of each indicator in the form of sub-indices have an additional advantage which provides detailed information regarding potential differences, strengths and weaknesses of the states.

Acs and Szerb (2010) has mentioned the relevance of two closely related theories, Theory of Weakest Link (TWL) and Theory of Constraints (TOC) regarding the importance of such detailed information. These two theories, which are mainly applied in production and operation management, argue that if the various indicators/areas are out of balance, development is inhibited and improvement can only be achieved by removing the weakest link that constrains the performance of the whole system. Thus, in the context of entrepreneurship, it implies that entrepreneurship development in any state depends on improving the binding institutional barriers and can be achieved by improving the worst performing indicator/variable.

There is a room for development in each state. Every state can improve its entrepreneurial climate and thereby entrepreneurial performance by addressing specific 'bottlenecks'. For example, among the leading states, Goa has a specific problem regarding the security with a higher number of physical and economic crimes and lesser

efficient system of police and judiciary. Among the weaker and poor institutional quality states the problem is in all sectors, but the priority sector is the opportunity. Of course, a balance between the different areas and among the various indicators is desirable, but all of them cannot be achieved simultaneously. Therefore, the weak performances in a particular area, that is, a bottleneck, should be concerned first because it has the negative effect on all the features.

Any generalization about India as a whole may have misleading information and conclusions. India is a combination of states with better institutional environment and quality which can attract investment as well as the states where the problems are worrisome. There are also certain states which experience imbalances among the various institutional factors. Similarly, there are certain states who are improving their relative positions, while the performances of some are declining over time. The interstate variation is significant and policymakers should consider these potential differences. Any policy or recommendations which would be applicable for one state may not be relevant for others. Every state has its own weaknesses and separate concerns.

Along with the differences there are some similarities between the similar category states. For example, poor institutional quality states have a similarity of weaknesses in terms of opportunity. Thus, detailed information on each state and each indicator is useful in understanding the institutional environment of the states and their differences with other states. One policy and action in all the states may show different results depending upon the institutional strengths or weaknesses of the various states. The institutional environment information of the states may provide a significant contribution in understanding the different level of entrepreneurship across the Indian states. According to which an effective policymaking can be done rendering the various needs and concerns of the states.

This chapter has tried to accomplish the first objective of the study to the possible extent, i.e., to sort out the important regional differences in the quality of institutions across the states of India in the context of entrepreneurship. Various differences among the states in terms of several indicators are highlighted in detail. A final overview is also provided for a general use in the form of the Institutional Quality Indices. In the next chapter, there is an exploration of the relationship between these institutional quality indices of the Indian states and the various measures of entrepreneurship, which is the second objective of the study.

**Notes:**

- i) Census in India, which provides the information regarding the urbanisation of the states, is conducted after every ten years. Hence, the figures for the year 2013-14 and 2006-07 have been worked out by extrapolation/interpolation of 2001 and 2011 Census data.
- ii) The data related to the households having the various sources of information are available only for the year 2011-12, i.e., from the Census, 2011. Therefore, the values are kept identical for all the years (2006-07, 2011-12, and 2013-14) in the sub-index 'index of availability'.
- iii) The index of security for the year 2006-07 is based on the four variables (inverse of the violent crime rate, inverse of the pendency percentage of IPC cases by police, inverse of the pendency percentage of IPC cases by courts and recovery percentage of the stolen property).

# Chapter 4

## Institutional Environment and Entrepreneurship

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### 4.1 Introduction

Entrepreneurship cannot take place in a vacuum; it depends on the institutions and the corresponding environment for performances as entrepreneurial activities are neither self-performing and self-stabilising nor self-regulating. Though entrepreneurial activity is an individual phenomenon, there must be something in the region, which can facilitate the emergence of entrepreneurship. Leibenstein (1968) expressed that the entrepreneurship may be scarce in some economies but some entrepreneurial characteristics may, in fact, be in surplus supply; that is, they are unused simply because of lack of motivational state and slight favourable changes in the environment may turn entrepreneurial scarcity into an abundant supply. Therefore, the development of supporting ecosystem for entrepreneurship may be crucial.

Underlining the importance of the supporting ecosystem, Harper (2003) mentioned the entrepreneurship within an appropriate institutional framework may in effect override the resource endowments and the scarcity which are the prime determinants of the economic performance of a region. With favourable environmental conditions and good parametrical structure, a region may catch up the innovations even outside the region. Therefore, Estrin and Mickiewicz (2010) mentioned the proposition of McMillan and Woodruff that to explain the low levels of entrepreneurship, one should first point to the weakness of institutions such as property rights enforcement.

Due to the existence and downward causation of institutions, entrepreneurs behave differently in different environmental conditions. Hence, differences in institutional environments may play an important role in explaining the differences in entrepreneurial opportunities and activities across the regions. Boettke & Coyne (2009) expressed that the variations in entrepreneurial opportunities and activities across the regions are not due purely to differences in entrepreneurial spirit, but instead are due to differences in institutions.

Considering the above literature and arguments, this chapter develops as an empirical exploratory work with the objective of identifying the relationship between the composite index of institutional quality and the entrepreneurship across the states of India. It attempts to make an addition to the studies and empirical evidences on the importance of the institutional environment/quality in the level of entrepreneurship.

#### **4.2 Entrepreneurship in the Empirical Context**

To examine the relationship between the institutional environment and the entrepreneurship, a quantity based empirical measure of entrepreneurship is required. But entrepreneurship as a concept cannot actually be directly measured. Moreover, it can be envisaged either in the latent form as related to the personality traits (conceiving entrepreneurship) or in the overt form as performing entrepreneurship. While the former is largely unobservable and not considered as a reliable instrument, the latter can be used as a measure. Therefore, entrepreneurship researcher started to focus more on what the entrepreneurs do rather than what their character traits are (Ligthelm, 2010).

Economists have been struggling to find appropriate measures of entrepreneurship and the academic literature has used several different measures of entrepreneurship like sole proprietorship, number of private enterprises, net business formation etc. (Hall & Sobel,

2008). There is no consensus on how entrepreneurship should be defined and measured in empirical research (Henrekson and Sanandaji, 2014). Therefore, current measures of entrepreneurship are highly scattered and thus fails to provide a readily available and easy to understand tool for comparing entrepreneurship across regions (Godin, Clemens and Veldhuis, 2008; Henrekson and Sanandaji, 2014). Nevertheless, the most common indicator of entrepreneurship tends to be the number of established enterprises, as the purposeful action in establishing firms or enterprises is at the heart of entrepreneurship. But it is a static view of entrepreneurship as the number of enterprises within a region or state is a stock variable (Nystrom, 2008). It reflects past economic activity as well as current conditions; therefore, it may either understate or overstate the entrepreneurial activities of a region (Hall & Sobel, 2008). But a major advantage of using a number of enterprises is that it is measured and can be compared across the states or regions and over time. Therefore, the rate of entrepreneurship is commonly proxied using quantity based metrics such as small business activity, self-employment rate, or the number of start-ups (Henrekson and Sanandaji, 2014).

#### **4.2.1 Different Proxies for Entrepreneurship Measurement**

Researchers in the economic and management sciences now focus on activity based entrepreneurship and entrepreneurial actions in the form of enterprises can be considered as proxies for entrepreneurship. But entrepreneurship can be performed in several forms (formal or informal) and through various means (Big, Small or Medium enterprises). It can occur in small start-up businesses as well as in large existing firms (Godin, Clemens and Veldhuis, 2008). Therefore, the question remains to answer is that which proxy should be used. One probable solution would be to use all the proxies: formal/informal or big/small enterprises. However, the dynamics of necessity/opportunity entrepreneurship are closely connected to the informal/formal status.

Most of the necessities driven entrepreneurship in developing countries are in the informal sector (Desai, 2009). Therefore, the disadvantages of using informal entrepreneurship/businesses as a measure of entrepreneurship are that it may not be necessarily driven by entrepreneurial activity rather by necessity or by demographic factors like huge population and unemployment (Godin, Clemens and Veldhuis, 2008). One practical difficulty also in using this measure as a proxy for entrepreneurship is regarding its measurement and availability of related data. Quantitative data on the number of enterprises in the informal sector is hardly available. Whatever data are available regarding the informal sector are either in the form of employment in this sector (Number of workers employed in the informal sector) or in the form of a share of this sector in GDP.

Thus, it is conceivable that necessity-based entrepreneurs start out as self-employed and are less likely to register themselves. Instead, opportunity based entrepreneurs are much more likely to register as a limited enterprise (De Kok, Deijb, and Essen, 2013). Thus, formal and registered enterprises seem to be better proxies.

However, the implication for measuring entrepreneurship through formal and registered enterprises is that it can occur both in small as well as in large existing firms. But, most of the big enterprises are not evenly distributed across all the regions, at least in the developing countries like India and are concentrated on few states. Therefore, recent studies stress on small business counts as a second best link for measuring entrepreneurship (Ghani, Kerr and Conell, 2011).

Small businesses have also been single out as the fountain of new job creation and challenges to the large stagnant firms (Hwang and Powell, 2008). An implicit assumption appears to be that countries or regions with a large number of small firms also tend to be those where most innovative high-growth firms emerge (Henrekson and

Sanandji, 2014). Centre for Development and Enterprise (2004) found entrepreneurship in its strongest and purest form at the level of small and medium sized enterprises, where individuals' self-reliance and risk-taking are particularly prominent (as cited in Ligthelm, 2010). Additionally, the service sector has expanded significantly in recent years and the growth of the service sector opened up opportunities that can at best be utilised by small businesses.

Nevertheless, this study uses both the proxies of formal entrepreneurship, in the form of industries (factories) as well as registered MSMEs, for the purpose of investigating the relationship between the measures of institutional environment and the measures of entrepreneurship. Number of firms or enterprises per million populations is being used as the indicator of entrepreneurship across the Indian states.

#### **4.3 Sources of Data and Methodology**

Data regarding the institutional environment of Indian states have been obtained from the institutional quality index developed in chapter 3. PFB adjusted indices are used for the analysis.

Two different proxies used regarding the measurement of entrepreneurship are: number of factories per million populations and number of registered MSMEs per million populations. The source of data related to the number of factories is Annual Survey of Industries conducted by the Government of India. The data of the number of micro, small and medium sized enterprises (MSMEs) are obtained from the last census data on MSMEs, which is available state-wise in the final report of the 'All India Census of MSMEs (2006-07): Registered sector' published in the year 2011. However, in an answer to the Lok Sabha Unstarred Question No. 3839, dated on 25.08.2011 the state-wise statistics of the number of registered MSMEs (2008-09 to 2011-12) is available at

*India Stat.com*. Therefore, in order to use the latest information both these data have been added together to get the total number of registered MSMEs till 2011-12. The number of factories and MSMEs have been normalised for population differences across the states and reported as the number of factories and the number of registered MSMEs per million populations. Data used in the study are both cross-section as well as panel.

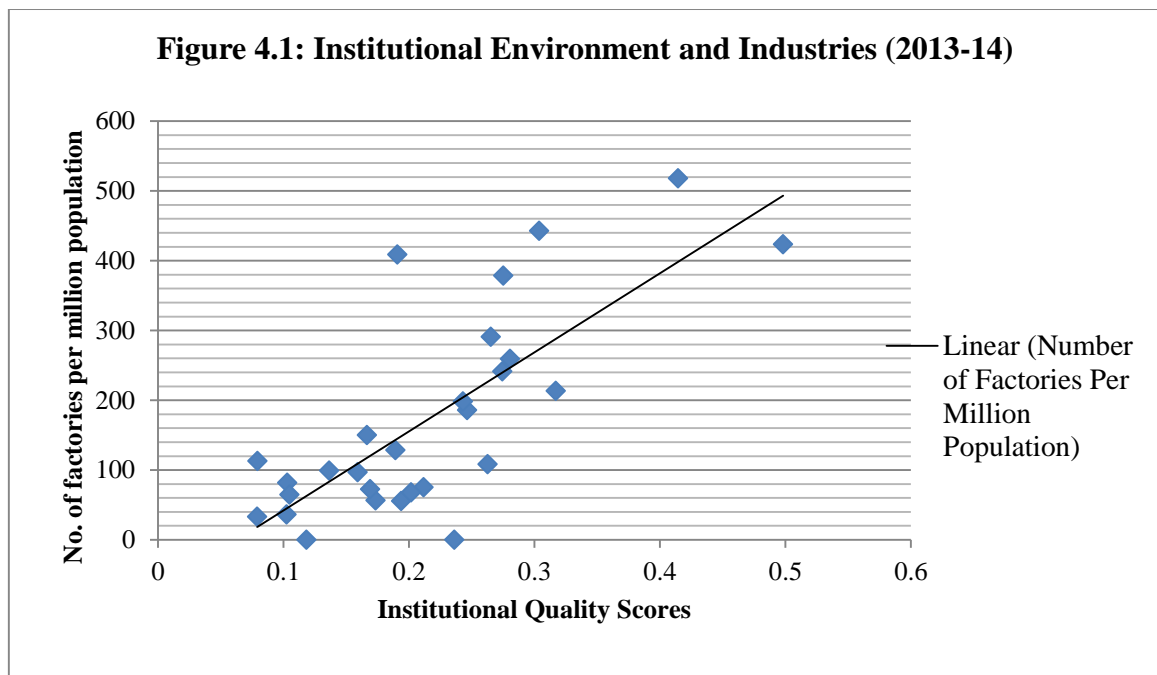
To examine the relationship between the institutional environment and the entrepreneurship various statistical and econometric techniques have been used:

- i. Pearson's correlation and Spearman's Rank correlation.
- ii. As a logical way Ordinary Least Square Regression model is employed to test the hypothesis that whether the institutional environment has any significant and causal relationship with the entrepreneurship of the region.
- iii. Since the data are available for at least two time periods (2006-07 and 2011-12), panel regression techniques are performed. Panel data techniques have the advantage that they allow us to control for individual heterogeneity, that is, specific characteristics of each state. Moreover, the number of states (28) is small; therefore, panel data and techniques can substantiate the relationship between the variables.

The information on the various statistical and econometric techniques used in the analysis of the relationship between the institutional environment and the various measures of the entrepreneurship is spelled out in detail.

#### 4.4. Institutional Environment and Industries (Factories)

To get the preliminary idea about the relationship between the institutional environment and the number of factories in India across its states, a scatter diagram is plotted in the form of Figure 4.1.



The Pearson's coefficient of correlation between the two variables is  $R = 0.7561$ , which is significant at the one percent level with ( $p=0.000$ ). Thus, the series of PFB adjusted institutional quality scores shows a positive and significant relationship with the series of number of factories per million populations, used as a proxy for entrepreneurship measurement.

Spearman's rank correlation is also used for verification of the relationship. The hypothesis tested regarding this is that whether the institutional quality scores and the number of factories per million populations have any relationship across the Indian states.

Test of  $H_0$ : Institutional quality scores and the number of factories are independent

The Spearman's rank correlation coefficient between the two variables is  $\rho = 0.7130$  and  $\text{prob} > |t| = 0.0000$ . Therefore, the null hypothesis cannot be accepted and the series of institutional quality scores and the series of number of factories are found to be positively and significantly correlated across the states of India.

In both the correlation analysis we get consistent results, therefore, it may be concluded that the series of institutional quality scores of Indian states is positively and significantly correlated with the series of number of factories per million populations. States with the better institutional environment have more number of factories adjusted for the population differences.

#### 4.4.1 Ordinary Least Squares (OLS) Model

As a logical way, OLS model is employed to test the hypothesis that institutional quality is a determinant of regional differences in entrepreneurship across the states of India measured through the number of factories per million populations. To test the causal relationship, it is hypothesized that the institutional environment as measured through the institutional quality scores influences the status of entrepreneurship in Indian states. Dependent variable in the model is the number of factories per million populations and the explanatory variable is the institutional quality scores of the states. Technically, the equation below describes the model (1) used for the regression analysis:

$$F_i = \alpha + \beta IQ_i + u_i \quad \dots\dots\dots (1)$$

Where,  $F_i$  = Number of Factories per million populations

$IQ_i$  = Institutional Quality scores,  $u_i$  = error term

#### 4.4.2 Control Variables

There is a possibility of other factors like infrastructure to be positively associated with the entrepreneurship measures. Infrastructure may be a good control variable in the analysis, but, infrastructure contains many elements including power and connectivity through roads, rail and air. Button (1998) mentioned that the concept of infrastructure can probably be restricted to transport and power. Therefore, both the power availability and road connectivity have been used as the control variable to determine the robustness of the institutional quality scores on the number of factories.

Data regarding actual power supply positions of the states is in terms of the deficit percentage of the energy requirement vis-à-vis energy availability of the various states during the year 2013-14. It is obtained from the annual Load Generation Balance Report (LGBR) 2014-15 of the Central Electricity Authority under the Ministry of Power of the Government of India.

On the other side, studies generally use road density per 100 or per 1000 square kilometre as the indicator of road connectivity. However, it is observed that some states have a very high road density, but only a small portion of it is surfaced. For example, Assam has a road density of 3623.65 per 1000sqkm which is second highest among Indian states, but only 18.83 percentages of these roads are surfaced (CSO, Infrastructure Statistics, 2014). Similarly, Kerala with highest road density (5543.5per 1000sqkm) has only 57.50 percentages of the surfaced roads. Therefore, length of surfaced roads per 100 square kilometres seems to be a better indicator of the quality of road connectivity as it shows the connectivity throughout the year. Data related to the surfaced length of roads is obtained from the Basic Road Statistics of India, 2013-14 published by the Transport Research Wing of the Ministry of Road Transport and Highways.

In the regression analysis the Bureaucratic efficiency is proxied by the Implementation Rate of Industrial Entrepreneurs Memorandum (IEM). An IEM denotes an intention to invest in an industry. However, when there are serious bureaucratic or other delays, the rate of implementation is expected to be low. Therefore, the variable (bureaucratic efficiency) is measured in terms of the ratio of the sums actually invested to the total proposed through IEMs. A high ratio implies fewer bureaucratic hurdles and hence better bureaucratic efficiency. Data related to the implementation rate of IEMs is obtained from the annual report (2013-14) of the Department of Industrial Policy & Promotion, Ministry of Commerce & Industry Government of India.

Thus, another model (Model 2) is used to verify the robustness of the regression by adding the control variables as explanatory variables in model 1.

Technically, the equation below describes the model (2) used for the regression analysis:

$$F_i = \alpha + \beta IQ_i + \gamma (\text{control variables}) + u_i \dots\dots\dots (2)$$

Where,  $F_i$  = Number of Factories per million populations

$IQ_i$  = Institutional Quality scores

$u_i$  = error term

Estimated result of the OLS models is depicted in the table 4.2 and the descriptive statistics of the variables are given in table 4.1.

On the basis of the results obtained in the regression analysis (Model 1), it is observed that the institutional environmental quality influences the entrepreneurial level of a state. On an average, if the institutional quality scores moves from the lowest (0.079) to the maximum (0.498) score, the number of factories per million populations may increase up to 493.

**Table 4.1: Descriptive Statistics of Institutional Index and Factories and other Explanatory Variables**

Variables	No. of Obs	Mean	Std. Dev.	Min.	Max
Factories	28	171.409	146.4071	0	518.0809
Institutional quality scores	28	0.21414	0.09768	0.0791	0.49809
Power supply	28	-4.28214	4.91807	-21.9	0
Surfaced road	28	102.477	75.383	9.1263	352.9012
Rate of IEM	28	0.462386	1.3257	0	7.0503

**Table 4.2: OLS Regression Results of Factories on Institutional Environment**

Independent Variables	Model 1			Model 2		
	Coeff.	Std. error	t statistics	Coeff.	Std. error	t statistics
Institutional Scores	1133.18	192.377	5.89***	1083.031	236.379	4.58***
Power Supply				3.423629	4.20265	0.81
Surfaced Road				0.058793	0.309934	0.19
Bureaucratic Efficiency				0.9979024	15.47405	0.06
Constant	-71.259	45.1414	-1.58	-52.34568	55.6178	-0.94
No of Observations	28			28		
R <sup>2</sup>	0.5716			0.5859		
Adjusted R <sup>2</sup>	0.5552			0.5139		
F- Statistics	F(1, 26) =34.70***			F( 4, 23) =8.14***		
Root MSE	97.647			102.08		
<b>Note:</b> ***significant at 1 per cent level; **significant at 5percent level and * significant at 10 per cent level						

Similarly, in the regression analysis with different control variables, the institutional quality scores yields a statistically significant positive coefficient suggesting that a better institutional environment is always important for entrepreneurship. It appears as a significant determinant of entrepreneurship (significant at the 1% level). Though control variables have a positive coefficient with respect to the entrepreneurship, it is not statistically significant.

There is no problem of heteroskedasticity with the models. However, robust regressions are carried out to take care of other possible problems like the presence of outliers and leverage. There are no significant changes in the robust regression results than the simple OLS models.

There is no problem of multicollinearity in the regression model (Model 2).

Durbin and Wu–Hausman tests for endogeneity are conducted assuming that the number of factories probably may affect the market size of the state which is one of the elements of the institutional quality index. It has been tested whether institutional quality scores can be treated as exogenous variable. On the basis of the results obtained, Durbin (score)  $\chi_1^2 = 2.23364$  ( $p = 0.1350$ ) and Wu-Hausman  $F(1, 24) = 2.08052$  ( $p = 0.1621$ ), there is no endogeneity in the model.

Therefore, one may reach to the conclusion that the institutional environment influences the level of entrepreneurship measured through the number of factories per million populations. The differences in institutional quality scores across the states are significant in determining the differences in their entrepreneurial level in terms of the number of factories. Therefore, an improvement in the quality of the institutional environment of a region or state may lead to an increase in the number of enterprises and thereby entrepreneurship in that state or region.

### 4.4.3 Bootstrap Regression

However, the assumptions of normality and asymptotic inference may be unreliable when the sample size is small. Basu (2001) advocated the application of bootstrap to obtain more precise estimates. Bootstrap is one of the resampling methods to approximate the small-sample distribution of estimators and Ader et al. (2008) recommend the bootstrap procedure when the sample size is insufficient for straightforward statistical inference. Bootstrap give better estimates for sample variances compared with the asymptotic normal estimate and allows assigning measures of accuracy to sample estimates (Basu, 2001; Efron and Tibshirani, 1993). Therefore, for small sample sizes, the application of the bootstrap procedure is to be encouraged (Basu, 2001).

In the bootstrap, the sample size is treated as the population and Pseudo data are then randomly generated (with replacement) from the sample data to obtain a distribution. This distribution is then used to obtain standard errors, confidence intervals and other statistics (Hall and Horowitz, 1996).

Thus, bootstrap OLS is used for better estimates of the regression results. However, there is no single rule of thumb for the ideal number of replications in bootstrap. Though increasing the number of samples cannot increase the amount of information in the original data, it can only reduce the effects of random sampling errors. As the number of replications are increased the differences in bootstrap standard error and 95% confidence interval becomes lower. Results of the bootstrap linear regression with various numbers of replications are reported in table 4.3. The bootstrap linear regression results are not significantly different from the ordinary least squares regression therefore; they validate

the general OLS results. Moreover, the bias-corrected confidence interval shows similar result as the percentile confidence interval, which indicates the unbiased statistics.

**Table 4.3**

**Bootstrap Linear Regression Results**

Independent variables	Obs. coeff.	Bootstrap std. error	z statistics	Bootstrap std. error	z statistics	Bootstrap std. error	z statistics
Institutional Scores	1083.031	225.94	4.79***	211.306	5.13***	219.49	4.93***
Power Supply	3.423629	3.4729	0.99	3.8183	0.90	3.677	0.93
Surfaced Road	0.058793	0.3907	0.15	0.34787	0.17	0.3558	0.17
Bureaucratic Efficiency	0.997902	51.236	0.02	58.927	0.02	57.37	0.02
Constant	-52.34568	53.25	-0.98	53.739	-0.97	53.55	-0.98
No of Observations	28			28			28
No. of Replications	100			500			1000
Wald chi2(4)	27.90*** (Prob > $\chi^2$ =0.0000)			31.27*** (Prob > $\chi^2$ =0.0000)			29.16*** (Prob > $\chi^2$ =0.0000)
R <sup>2</sup>	0.5859			0.5859			0.5859
Adjusted R <sup>2</sup>	0.513			0.513			0.513
Root MSE	102.07			102.07			102.07
<b>Note:</b> *** P> z  <0.01; ** P> z  <0.05 and * P> z  <0.1							

Thus, from the various econometric tests and analysis, it is found that the institutional quality scores are significant and robust determinant of the industrial entrepreneurship. It affects the number of factories in a state positively. Consequently, improvement in the average institutional environmental quality seems to play an important role in the development of entrepreneurship in a state.

#### 4.4.4 Exploration of the Impact of Sub-Indices

The individual effects of all the three sub-indices (opportunity, availability, security) on the number of factories have also been identified separately. The results of the regression analyses are reported in the table 4.4. While all the sub-indices (index of opportunity, index of availability and index of security) show a positive effect on the number of factories per million populations, the environment of availability has the maximum effect with higher significance level.

**Table 4.4**  
**OLS Regression Results of the Factories on the Sub-Indices**

Independent Variables	Coeff.	Std. error	t statistics	Bootstrap Std. error	z statistics
Index of opportunity	231.1005	119.17	1.94*	228.87	1.01
Index of Availability	582.3117	155.98	3.73***	186.004	3.13***
Index of Security	402.0483	230.64	1.74*	227.99	1.76*
Constant	-101.3002	66.968	-1.51	58.185	-1.74*
No of Observations	28			28	
No. of Replications				1000	
Wald chi2(3)				42.34*** Prob > $\chi^2=0.0000$	
R <sup>2</sup>	0.6070			0.6070	
Adjusted R <sup>2</sup>	0.5579			0.5579	
F- Statistics	F( 3, 24) = 12.36 ***				
Root MSE	97.347			97.3469	
<b>Note:</b> ***significant at 1 per cent level; **significant at 5percent level and * significant at 10 per cent level					

#### 4.4.5 Panel Data Regression

Panel data techniques can enrich the empirical analysis and results in ways that may not be possible in case of using the cross-section data and analysis. It can take into account the heterogeneity of states and provide more informative results, more variability, more degrees of freedom and more efficiency (Gujarati, Porter and Gunasekar, 2013). Since, the institutional quality index is calculated for three different time periods (2006-07, 2011-12 and 2013-14); panel data techniques have been adopted to enrich the analysis. Panel data are further helpful in enriching our previous analyses.

Hausman test is used to decide between fixed or random effects model. It basically tests whether the unique errors ( $u_i$ ) are correlated with the regressors. The null hypothesis is they are not. On the basis of the Hausman test results ( $\chi^2_3=21.47$ ;  $\text{Prob}>\chi^2=0.0001$ ) fixed effect models are found to be more appropriate model as the null hypothesis is rejected.

However, there are two kinds of information in any panel data (cross-sectional time series data):

- (i) The cross-sectional information reflected in the changes between the subjects.
- (ii) The time-series or within subject information reflected in the changes within subjects.

The fixed effect answers the question about the effect of  $x$  (explanatory/independent variables) when  $x$  changes within person, while the between regression answers the question about the effect of  $x$  when  $x$  changes between entities<sup>1</sup>.

Fixed-effects models are designed to study the causes of changes within the subjects (or Entity). They do not work well with data for which within-cluster variation is minimal or

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<sup>1</sup> Taken from the state web page <http://www.stata.com/support/faqs>

for slow changing variables over time (Oscar Torres-Reyna, Princeton University, 2007)<sup>2</sup>. Since, the estimated institutional quality scores measure the differences in the institutional environment between the entities (states) and do not give any idea about the changes in the institutional quality of the states over time, the differences across the entities (states) are important for the purpose of our analysis. Therefore, the ‘fixed effect within model’ which estimates the time series information in the panel data is not useful in this case. Rather the ‘between estimators’ is reasonable which provides the cross-sectional information reflected in the changes between the subjects (states). Moreover, on the basis of the AIC (Akaike information criterion) and BIC (Bayesian information criterion) in model selection, Between effect estimators seems more appropriate than the Fixed effect model. It has lower AIC (334.7459) and BIC values (344.4691) in comparison to the fixed effect AIC (832.7198) and BIC (842.4431) values.

The ‘ $\rho$ ’ value in the fixed effect model also indicates that about 90% of the variance is due to differences across panels ( $\rho=0.89880351$ ). Therefore, between effect model is used to verify that whether the differences in the institutional quality scores between the states determine the differences in the entrepreneurship between them in terms of number of factories.

When a between effect model is used in any panel data, it basically is a regression of the averages of the explanatory variables against the averages of the outcome variables of the subjects. Thus, the Between Effect regression model measures the expected difference in number of factories between the states if they differ in institutional quality scores by one unit.

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<sup>2</sup> Available at <http://d December 2007 ss.princeton.edu/training/>

Technically the equation below describes the model used for the analysis:

$$\bar{F}_i = \alpha + \beta_1 \bar{IQ}_i + \beta_2 \bar{R}_i + \beta_3 \bar{P}_i + u_i + \bar{\varepsilon}_i$$

$\bar{F}_i$  = Average of the number of factories per million populations (2006-07, 2011-12, and 2013-14)

$\bar{IQ}_i$  = Average of the Institutional Quality scores (2006-07, 2011-12 and 2013-14)

$\bar{R}_i$  = Average surfaced road per 100 sq. km (2006-07, 2011-12 and 2013-14)

$\bar{P}_i$  = Average power supply condition (2006-07, 2011-12 and 2013-14)

$u_i$  = unobserved individual specific variable

$\varepsilon_i$  = error term

The results of the Between Effect regression model are reported in table 4.5.

**Table 4.5: Results of the Between Effect Regressions**

Independent Variables	Coeff.	Std. error	t statistics
Institutional Scores	969.5927	209.8694	4.62***
Power Supply	2.940027	3.301472	0.89
Surfaced Road	0.0645482	0.3253915	0.20
Constant	-43.58913	52.26472	-0.83
No of Observations	84		
No of groups	28		
R <sup>2</sup> (within)	0.0022		
R <sup>2</sup> (Between)	0.6011		
R <sup>2</sup> (overall)	0.5260		
F- Statistics	F(3, 24) =12.06*** (Prob > F= 0.0001)		
sd(u <sub>i</sub> + avg(e <sub>i</sub> )) = 89.37887			
<b>Note:</b> ***significant at 1 per cent level; **significant at 5percent level and * significant at 10 per cent level			

Since the data for the bureaucratic efficiency measured in terms of IEMs implemented could not be availed for the year 2006-07; it is not used in the panel regression.

The results provided in table 4.5 indicate that the differences in institutional quality between the states of India significantly influence the number of factories between them and the institutional quality scores may be considered as a significant determinant of the entrepreneurship.

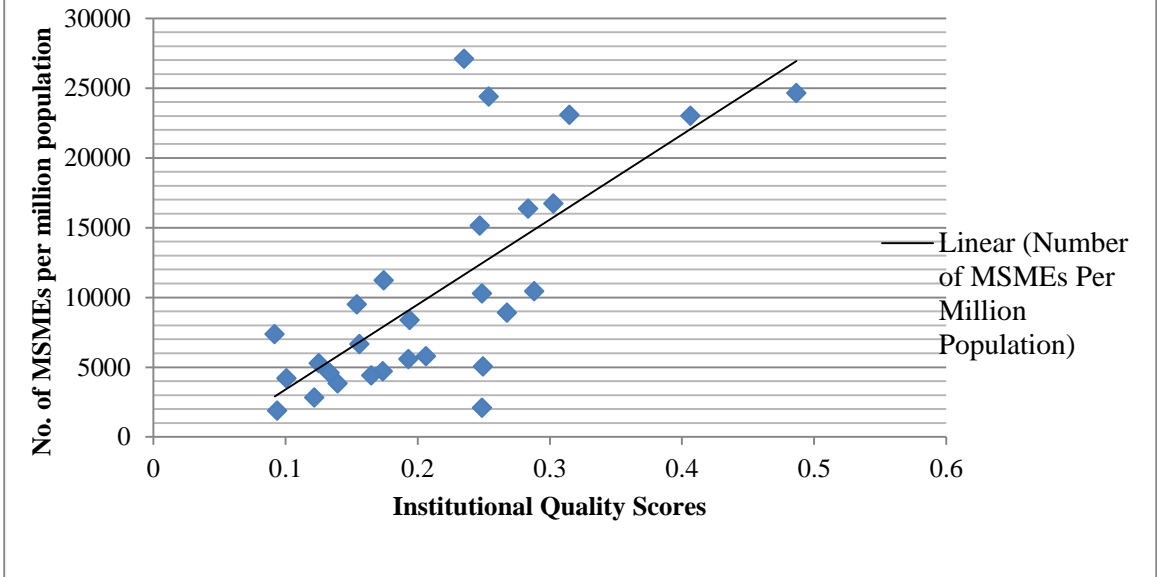
Thus, institutional quality differences between the Indian states determine the regional differences in entrepreneurship between them proxied by the number of factories per million populations. A higher quality of the institutional environment indicates a better institutional environment conducive for the entrepreneurship development and tends to increase the number of enterprises or factories.

#### **4.5 Institutional Environment and MSMEs**

Likewise, to have a preliminary idea about the relationship between the institutional quality scores and the Micro, Small and Medium enterprises (MSMEs) in India across its states, a scatter diagram is plotted in the form of Figure 4.2.

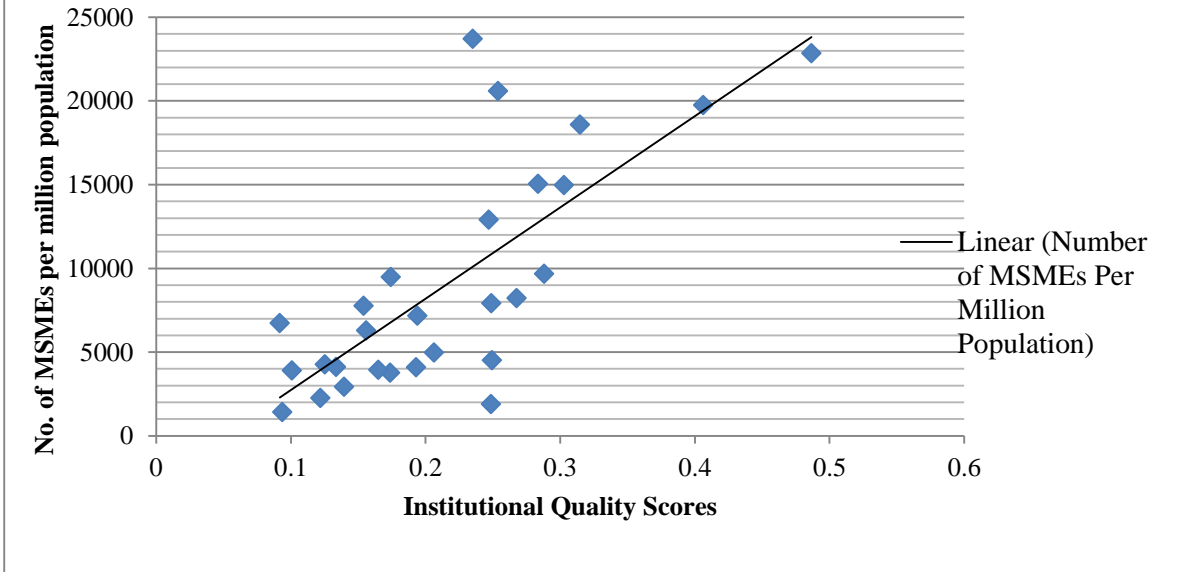
The Pearson's coefficient of correlation between the series of PFB adjusted institutional quality scores (2011-12) and the series of total number of registered MSMEs is 0.7335 ( $p=0.000$ ), which indicates a positive and significant relationship between the two variables. Similarly, the Spearman's rank correlation coefficient between the two variables is 0.7126 with  $\text{Prob} > |t| = 0.0000$ . Thus, the null hypothesis (**H<sub>0</sub>**: Institutional quality scores and number of MSMEs are independent) is not accepted in this case. States with the better institutional environment have more number of MSMEs adjusted for the population differences.

**Figure 4.2. Institutional Environment and MSMEs (2011-12)**



Another appropriate proxy for entrepreneurship may be the number of new registrations, i.e., the number of registered MSMEs between the time periods 2008-09 to 2011-12. The scatter diagram showing the relationship of the number of registered MSMEs (2008-09 to 2011-12) with the institutional quality scores is plotted as figure 4.3.

**Figure 4.3. Institutional Environment and Registered MSMEs (2008-09 to 2011-12)**



The Pearson's coefficient of correlation between the numbers of registered MSMEs (2008-09 to 2011-12) and the PFB adjusted institutional quality scores is 0.7498 with (p=0.0000). The Spearman's rank correlation between the two variables is 0.724 which rejects the null hypothesis of the independence of the two variables with Prob> |t| = 0.0000.

Since, the results are almost similar for both the proxies (total number of MSMEs and the numbers of registered MSMEs (2008-09 to 2011-12), and the coefficient of correlation between the two variables is 0.9963, total number of MSMEs, is used for further analysis.

#### 4.5.1 Ordinary Least Squares (OLS) Regression

It is to be verified whether the institutional quality scores have any effect on the regional differences across the states of India in terms of the number of MSMEs per million populations. As a logical way OLS model is generally employed to test the causal relationship between the variables. Hence, to test the causal relationship OLS model is employed with the hypothesis that the institutional environment measured through institutional quality scores influences the status of entrepreneurship through the means of MSMEs. The explanatory variable in the model is the institutional quality scores of the various states. All the variables used in the analysis are till the year 2011-12, as the latest data is available and could be estimated up to this year only.

The model (1) used for the regression analysis can be represented through the following equation:

$$M_i = \alpha + \beta IQ_i + u_i \quad \dots\dots\dots (1)$$

Where,  $M_i$  = Number of MSMEs per million populations

$IQ_i$  = Institutional Quality scores

$u_i$  = error term

#### 4.5.2 Control Variables

The presence of the factories in a state may play a bigger role in determining the number of MSMEs in a region. Hence, the number of factories may be an important control variable in our analysis. Likewise, infrastructure variables, power supply condition and quality of roads as well as the bureaucratic efficiency can also be used as control variables.

Thus, another model (Model 2) is used to verify the robustness of the regression by adding the control variables as explanatory variables in model 1.

Technically, the equation below describes the model (2) used for the regression analysis:

$$M_i = \alpha + \beta IQ_i + \gamma (\text{control variables}) + u_i \quad \dots\dots\dots (2)$$

Where,  $M_i$  = Number of MSMEs per million populations

$IQ_i$  = Institutional Quality scores

$u_i$  = error term

Estimated result of the OLS models is depicted in the table 4.7 and the descriptive statistics of the variables are given in table 4.6.

On the basis of the results obtained in the OLS regression analysis, it is observed that the institutional environmental quality influences the entrepreneurial level (Number of MSMEs) significantly through the cross-sections of the Indian states.

**Table 4.6: Descriptive Statistics of Institutional Index and MSMEs and other Explanatory Variables**

Variables	No. of Obs	Mean	Std. Dev.	Min.	Max
MSMEs Per million populations	28	10487.65	7717.274	1900.212	27111.59
Institutional quality scores	28	0.2162959	0.0929603	0.0916977	0.4866004
Factories Per million populations	28	168.4629	147.3569	0	512.7862
Power supply	28	-7.678571	7.137712	-24.8	-0.4
Surfaced road	28	88.3226	66.68325	9.890387	318.7325
Rate of IEM	28	0.0629658	0.0852093	0	0.3582362

**Table 4.7: OLS Regression Results of MSMEs on Institutional Environment**

Independent Variables	Model 1			Model 2		
	Coeff.	Std. error	t statistics	Coeff.	Std. error	t
Institutional Scores	60891.48	11066.28	5.50***	52803.72	20374.08	2.59**
Factories				5.670931	11.90386	0.48
Power Supply				8.516682	177.987	0.05
Surfaced Road				7.036151	22.99924	0.31
Bureaucratic Efficiency				-5579.956	15654.67	-0.36
Constant	-2682.93	2598.029	-1.03	-2093.632	3408.361	-0.61
No of Observations	28			28		
R <sup>2</sup>	0.5380			0.5487		
Adjusted R <sup>2</sup>	0.5202			0.4462		
F- Statistics	F(1, 26) = 30.28 ***			F(5, 22) = 5.35***		
Root MSE	5345.4			5743.2		
<b>Note:</b> ***significant at 1 per cent level; **significant at 5percent level and * significant at 10 per cent level						

On the basis of model (1), if the institutional quality score of a state improves from the minimum (0.0916977) to the maximum (0.4866), then, on an average, the number of MSMEs will increase from 2900 to 26947 per million populations. Similarly, if the state reaches to the maximum possible score of one (1), then the total number of MSMEs per million populations will be approximately 58208.

On the basis of the results of the model (2) as reported in the table 4.7, it is found that the institutional quality score yields a statistically significant positive coefficient in the model with different control variables. Though most of the control variables show positive coefficients with respect to the number of MSMEs, they are not significant. Therefore, it may be concluded that the institutional quality scores are the robust determinant of the entrepreneurship measured through the number of registered MSMEs.

Unlike in the case of big factories, the implementation rate of the IEM has a negative, though insignificant, impact on the number of MSMEs present in a state. This relation is, though not quite evident and conclusive, conforming to the views of Zvirgzde et al. (2013) and Storey (2008) that the government preferential treatment mostly favours the big business enterprises and this exclusive policy of preferential treatment may have a negative impact on other businesses specifically small enterprises.

There is no problem of multicollinearity in the regression model (Model 2).

Durbin and Wu–Hausman tests for endogeneity are conducted assuming that the number of MSMEs probably may affect the market size of the state which is one of the elements of the institutional quality index. It has been tested whether institutional quality scores can be treated as exogenous variable. On the basis of the results obtained, Durbin (score)  $\chi_1^2 = 0.253611$  ( $p = 0.6145$ ) and Wu-Hausman  $F(1, 24) = 0.219368$  ( $p = 0.6437$ ), there is no endogeneity in the model.

There is also no problem of heteroskedasticity in the analysis.

Control variables do not decline the significance of the better institutional environment quality. Institutional quality scores are significant in determining the number of MSMEs in all the cases. Thus, a state with a better institutional environment in terms of higher institutional quality scores may have a higher level of entrepreneurship in terms of a larger number of MSMEs.

#### **4.5.3 Bootstrap Regression**

However, as discussed earlier, the assumptions of normality and asymptotic inference may be unreliable with the small sample size. Basu (2001) advocated the application of bootstrap to obtain more precise estimates. Bootstrap, which is one of the resampling methods to approximate the small-sample distribution of estimators, is recommended by Ader et al. (2008) when the sample size is insufficient for straightforward statistical inference. It provide better estimates for sample variances compared with the asymptotic normal estimate and allows assigning measures of accuracy to sample estimates (Basu, 2001; Efron and Tibshirani, 1993). Therefore, for small sample sizes, the application of the bootstrap procedure is reasonable.

In the process of bootstrap, the sample size has been treated as the population and Pseudo data are then randomly generated (with replacement) from the sample data to obtain a distribution. This distribution is then used to obtain standard errors, confidence intervals and other statistics (Hall and Horowitz, 1996).

Thus, bootstrap linear regression is used for better estimates of the regression results. However, there is no single rule of thumb for the ideal number of replications in bootstrap. Though increasing the number of samples cannot increase the amount of

information in the original data, it can only reduce the effects of random sampling errors. As the number of replications are increased the differences in bootstrap standard error and 95% confidence interval becomes lower. Results of the bootstrap linear regression with various numbers of replications are reported in table 4.8.

In the bootstrap linear regression results, the significance level of institutional environment quality as a determinant of the number of MSMEs goes down (from 5% to 10%).

**Table 4.8: Bootstrap Linear Regression Results in case of MSMEs**

Independent variables	Obs. coeff.	Bootstrap std. error	z statistics	Bootstrap std. error	z statistics	Bootstrap std. error	z statistics
Institutional Scores	52803.72	30853.84	1.71*	29902.38	1.77*	30027.89	1.76*
No. of factories	5.670931	20.074	0.28	17.81471	0.32	17.49827	0.32
Power Supply	8.516682	146.6208	0.06	146.3305	0.06	154.6387	0.06
Surfaced Road	7.036151	29.68157	0.24	30.34042	0.23	29.94077	0.24
Bureaucratic Efficiency	-5579.956	23095.63	-0.24	20733.73	-0.27	19735.81	-0.28
Constant	-2093.632	2483.344	-0.84	2444.488	-0.86	2550.524	-0.82
No of Observations	28			28		28	
No. of Replications	100			500		1000	
Wald chi2 (5)	56.50*** (Prob > $\chi^2$ =0.0000)			38.69*** (Prob> $\chi^2$ =0.0000)		34.57*** (Prob> $\chi^2$ =0.0000)	
R <sup>2</sup>	0.5487			0.5487		0.5487	
Adjusted R <sup>2</sup>	0.4462			0.4462		0.4462	
Root MSE	5743.2491			5743.2491		5743.2491	
<b>Note:</b> *** P> z  <0.01; ** P> z  <0.05 and * P> z  <0.1							

Therefore, though the institutional environment quality has higher significance than other control variables, its significance level is lower in bootstrap linear regression than the

OLS. It affects the number of MSMEs in a state positively but not as strongly as in case of factories.

#### 4.5.4 Exploration of the Impact of Sub-Indices

Like in the case of factories, the individual effects of the sub-indices (index of opportunity, index of availability and index of security) are also captured through the regression analysis for the MSMEs and reported in the table 4.9. Here, both the opportunity and the availability appear as significant factors in the determination of the number of MSMEs in a region or state in case of OLS. However, when the bootstrap linear regression is used; it is only the availability, which appears as significant factor. On the other side, index of security though have a positive impact, does not appear as a significant factor in the determination of the number MSMEs. Thus, the availability of credit, education and the information are more consistent and important factor in the development of the entrepreneurship in any region either in the form of factories or in the form of MSMEs.

**Table 4.9: OLS Regression Results of the MSMEs on the Sub-Indices**

Independent Variables	Coeff.	Std. error	t statistics	Bootstrap Std. error	z statistics
Index of opportunity	20100.59	6700.711	3.00***	20221.37	0.99
Index of Availability	20242.07	8566.206	2.36***	11566.83	1.75*
Index of Security	10158.6	11878.33	0.86	11887.01	0.85
Constant	-218.3467	3942.091	-0.06	2806.399	-0.08
No of Observations	28			28	
No. of Replications				1000	
R <sup>2</sup>	0.5531			0.5531	
Adjusted R <sup>2</sup>	0.4972			0.4972	
F- Statistics	F( 3, 24) = 9.90***				
Wald chi2 (3)				42.04***	
Root MSE	5472			5472	
<b>Note:</b> ***significant at 1 per cent level; **significant at 5percent level and * significant at 10 per cent level					

#### 4.5.5 Panel Data Analysis

Panel data regressions can enrich the empirical analysis in ways that may not be possible if only cross-section data is used. Therefore, to substantiate the OLS regression results and enrich the analysis, panel data techniques have been adopted. The data related to the dependent variable (number of MSMEs) could be availed only for two time periods (2006-07 and 2011-12). Therefore, the panel regressions can be performed, including these two time periods only.

Hausman test is used to decide between fixed or random effects model. It basically tests whether the unique errors ( $u_i$ ) are correlated with the regressors. The null hypothesis is they are not. On the basis of the Hausman test results ( $\chi^2_4 = 21.47$ ;  $\text{Prob} > \chi^2 = 0.0023$ ) fixed effect models are found to be more appropriate model as the null hypothesis is not accepted.

As discussed earlier, the 'fixed effect within model' which estimates the time series information in the panel data is not found useful in this case; rather the 'between estimators', which provides the cross-sectional information reflected in the changes between the subjects (states) seems more suitable. Moreover, on the basis of the AIC (Akaike information criterion) and BIC (Bayesian information criterion) in model selection, Between effect estimators seems more appropriate than the Fixed effect model. It has lower AIC (534.3554) and BIC values (544.4822) in comparison to the fixed effect AIC (1096.005) and BIC (1106.131) values. The ' $\rho$ ' value in the fixed effect model also indicates that about 60% of the variance is due to differences across panels ( $\rho = 0.60024897$ ).

Technically the equation below describes the model used for the analysis:

$$\bar{M}_i = \alpha + \beta_1 \bar{IQ}_i + \beta_2 \bar{R}_i + \beta_3 \bar{P}_i + \beta_4 \bar{F}_i + u_i + \bar{\varepsilon}_i$$

Where,

$\bar{M}_i$  = Average of the number of MSMEs per million populations (2006-07 and 2011-12)

$\bar{IQ}_i$  = Average of the Institutional Quality scores (2006-07 and 2011-12)

$\bar{R}_i$  = Average surfaced road per 100 sq. km (2006-07 and 2011-12)

$\bar{P}_i$  = Average power supply condition (2006-07 and 2011-12)

$\bar{F}_i$  = Average of the number of factories per million populations (2006-07 and 2011-12)

$u_i$  = unobserved individual specific variable

$\varepsilon_i$  = error term

Since the data for the bureaucratic efficiency measured in terms of IEMs implemented could not be availed for the year 2006-07; it is not used in the panel regression.

The results of the Between Effect regression model are reported in table 4.10.

The results provided in table 4.10 indicate that the differences in institutional quality between the states of India significantly influence the number of MSMEs between them. The difference in the institutional quality scores between the states may result in the differences in the number of MSMEs between them. Hence, the institutional quality scores may be considered as a significant determinant of the entrepreneurship.

**Table 4.10****Results of the Between Effect Regressions**

Independent Variables	Coeff.	Std. error	t statistics
Institutional Scores	23535.31	9772.336	2.41**
Power Supply	-66.85539	98.91689	-0.68
Surfaced Road	14.09375	12.04038	1.17
No. of factories	4.560561	7.297791	0.62
Constant	-43.58913	52.26472	-0.83
No of Observations	56		
No of groups	28		
R <sup>2</sup> (within)	0.0139		
R <sup>2</sup> (Between)	0.5731		
R <sup>2</sup> (overall)	0.2244		
F- Statistics	F(4, 23) = 7.72*** (Prob > F= 0.0004)		
sd (u <sub>i</sub> + avg(e <sub>i</sub> )) = 3111.642			
<b>Note:</b> ***significant at 1 per cent level; **significant at 5percent level and * significant at 10 per cent level			

**4.6 Some Other Observations**

In the comprehensive list of Startup Incubators in India provided in the July 2017 report by the Ministry of the MSME, it is observed that the concentration of the most of the business incubation centres is in the leading institutional environments regions like Tamil Nadu, Karnataka, Kerala, Maharashtra and Gujarat. On the other hand, the lagging regions like Arunachal Pradesh, Meghalaya, Chhattisgarh, Assam, Bihar and Jharkhand have few (1or 2) or no business incubation centres.

Similarly, from the information provided by the Indian Private Equity and Venture Capital Association (PVCA) related to the Private Equity investment across some Indian states in their publication “The Fourth Wheel 2017, it is found that the startup sector

dominated investment in terms of volumes and values across the leading Regions including the National Capital Range, NCR (Delhi, some parts of Haryana and Western Uttar Pradesh). The share of these states in terms of volume and values of Private Equities Investment 2016 is more than 96 percent, including NCR and more than 64 percent excluding NCR.

#### **4.7 Analysis and Conclusion**

Various statistical and econometric techniques used for the analysis indicate that the entrepreneurial activities through the means of enterprises are consistently associated with the institutional environment of the states. The estimated coefficients of the institutional quality scores are always significant, whether it is the case of the factories or the case of the registered MSMEs. Though, infrastructure variables have a positive influence on the entrepreneurship, they do not decline the significance of the quality of institutions. Even the presence of the factories does not turn down the importance of the better institutional environment in the case of MSMEs in India. Statistically speaking, the explanatory power of institutional quality scores regarding entrepreneurial activities is reasonably good as judged by the various tests of significance.

The empirical evidences suggest that the differences in institutional quality scores can play a significant role in explaining the variations in the extent of entrepreneurial activities across the Indian states. Good qualities of the institutional variables collectively foster an entrepreneurial climate conducive for the entrepreneurship development which pushes the states with better institutional environment ahead of others in terms of the different measures of the entrepreneurship. The empirical evidences demonstrate that a larger market size, better legal structure and security environment, as well as better availability of the credit, education and information

together tend to increase entrepreneurship. Therefore, the states with better quality of the institutional environment may have more numbers of formal and registered enterprises; while the states with weaker institutional environment have a lesser development of the entrepreneurship. Hence, differences in institutional quality scores may help considerably in explaining the differences in entrepreneurship across the various regions/states of India.

This study and particularly this chapter provide empirical evidences to expand the literature favouring institutional reform for entrepreneurship development. Improvement in the various determinants of the institutional environment may considerably improve the entrepreneurship scenario of a state or region. Therefore, a better institutional environment and better quality of the institutional variables are always required for the development of the entrepreneurship. Policy initiatives should focus on the general institutional environment improvement and subsequent initiatives of the business incubation centres would then be able to channelize such entrepreneurial capabilities.

Note:

- i. The data of the number of micro, small and medium sized enterprises (MSMEs) are available state-wise in the final report of the 'All India Census of MSMEs (2006-07): Registered sector'. However, in an answer to the Lok Sabha Unstarred Question No. 3839, dated on 25.08.2011 the state-wise statistics of the number of registered MSMEs (2008-09 to 2011-12) is available at *India Stat.com*.
- ii. In order to use the latest information about the number of MSMEs, the total number of MSMEs till 2006-07 is added together with the total number of registered MSMEs between 2008-09 and 2011-12. Thus, the number of MSMEs in year 2011-12 is the outcome of the addition of these two numbers.
- iii. The number of factories in year 2013-14 and 2011-12 are normalised with the population of the states (based on the census, 2011) to get the values of factories per million populations.
- iv. Census of India is conducted after every 10 years. Hence, the population in the year 2006-07 are obtained from the interpolation/extrapolation of the census 2001 and 2011 data. The numbers of factories and MSMEs per million populations (2006-07) are based on it.
- v. Data for the bureaucratic efficiency measured in terms of IEMs implemented could not be availed for the year 2006-07; therefore, it is not used in the panel regression.



# Chapter 5

## Summary of Findings, Conclusion and Policy Suggestions

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### 5.1 Introduction

Various regions have different quality of institutions and the variations in the institutional environment may be an important factor in determining the different level of entrepreneurship across the regions. Consequently, the less development of the entrepreneurship in a region may indicate the weaknesses of institutions. With this idea in mind, the research is undertaken with the aim of identifying the relationship between the institutional environment and the two different measures of entrepreneurship (number of factories and number of MSMEs) in case of India.

In the process, the study also attempts to identify the important regional differences in the institutional environment across the states of India. It has been tried to capture the institutional environment in a region through various institutional variables and regional traits. Variables used in the process of identifying the institutional environment differences across the Indian states are categorised into three headings: Index of Opportunity, Index of Availability and Index of Security. The index of opportunity is composed of two variables ( $\text{per capita NSDP} \times \text{Percentage of Urbanisation}$ ) which capture the opportunity perception and market size of a region. The index of availability captures the accessibility of the population to the credit, information and the higher education. Similarly, the index of security measures the safety of lives and property against various physical and economic crimes with the help of various crime rates

reported by the National Crime Record Bureau. The index also indicates the legal efficiency differences across the various states of India measured in terms of the pendency of the cases in courts and police as well as the percentage of the recovery of the stolen property. Finally, the index of institutional quality provides a general overview of the institutional environment differences across the states of India.

All these differences among the states in terms of the various determinants of institutional quality collectively create entrepreneurial differences between them. The differences in the institutional environment turn into the variation in the number of enterprises between the states.

## **5.2 Summary of Findings**

### **5.2.1 Institutional Environment: Interstate Differences**

- i. The Market Sizes of Indian states vary widely. Per capita NSDP, which is one of the components of the size of the market, varies from fifteen thousand five hundred six (15506) to one lakh thirty seven thousand four hundred one (137401). Similarly, the percentage of the population living in the urban region differs from ten percent (10.112) to sixty six percent (65.893). These differences across the regions finally lead to the variability in the opportunities for the entrepreneurial activities in terms of the relative opportunity scores.
- ii. The credit environment is also quite different across the Indian states. The credit-deposit ratio of the scheduled banks is as low as 17.72 and high up to 121.75. Interestingly, there are only five states (Andhra Pradesh, Maharashtra, Punjab, Rajasthan and Tamil Nadu) out of 28 which have a Credit Deposit ratio higher than the all India average (78.9).

- iii. The Gross Enrolment Ratio in higher education in India is 23 and there are 13 states having the values less than this average. But, there are some states like Tamil Nadu having a GER of 43.
- iv. The study finds huge differences in terms of the accessibility of the masses to the various sources of information (Computer with Internet, Television, and Radio) across the states of India.
- v. In terms of the security of lives and property against physical and economic offences, Indian states show different performances. There are some states like Kerala having a crime rate of 197, in terms of the physical crimes; on the other hand, there is a state like Nagaland having a crime rate of only eleven. Similarly, while in Tamil Nadu, there is about seventy percent recovery of the stolen property, in Manipur only five percent of the stolen property could be recovered. Some states with better opportunity condition have a worse security environment, at the same time there are states having both better opportunity and security condition.
- vi. The overall institutional environmental view is different from the individual performances in terms of the various indicators. These differences are seen among the states irrespective of geography and location of the state. It is further observed that while a state performs extremely well in certain indicators, its performances are not satisfactory in others. One cannot say that states with higher average institutional quality scores perform better in all respects than that of states with lower average institutional quality scores.
- vii. Every region or states has its own strengths and weaknesses. However, any state can improve its entrepreneurial climate and thereby entrepreneurial performance

by addressing specific 'bottlenecks'. Thus, the detailed information about the performances of the states in terms of the various indicators is important.

### **5.2.2 Institutional Environment and Industries (Factories)**

- i. The series of PFB adjusted institutional quality scores shows a positive and significant relationship with the series of number of factories per million populations. On the basis of the results obtained in the regression analysis, it is observed that the institutional environmental quality influences the entrepreneurial level of a state in a significant manner.
- ii. In the regression analysis with different control variables, the institutional quality score yields a statistically significant positive coefficient suggesting that a better institutional environment is always important for entrepreneurship. It appears as a significant determinant of entrepreneurship measured through the number of factories per million populations.
- iii. The bootstrap linear regression results are not significantly different from the ordinary least squares regression therefore; they validate the general OLS results.
- iv. While all the sub-indices (index of opportunity, index of availability and index of security) show a positive effect on the number of factories per million populations, the environment of availability has the maximum effect with higher significance level.
- v. The panel regression technique (Between Regressions) also indicates that the differences in institutional quality between the states of India significantly influence the number of factories between them.

### 5.2.3 Institutional Environment and MSMEs

- i. A positive and significant association is found between the series of institutional quality scores and the series of number of MSMEs per million populations across the various states of India.
- ii. On the basis of the results obtained in the OLS regression analysis, it is observed that the institutional environmental quality influences the entrepreneurial level (Number of MSMEs) significantly through the cross-sections of the Indian states.
- iii. On the basis of the regression results with different control variables, it is found that the institutional quality score yields a statistically significant positive coefficient. Control variables do not decline the significance of the better institutional environment quality. Though some variables show positive coefficients with respect to the number of MSMEs, they are not significant.
- iv. In the bootstrap linear regression results, the significance level of institutional environment quality as a determinant of the number of MSMEs goes down (from 5% to 10%).
- v. Both the opportunity and the availability appear as significant factors in the determination of the number of MSMEs in a region or state in the OLS regression. However, when bootstrap regression is used; it is only the availability, which appears as significant factor. On the other side, index of security though has a positive impact, does not appear as a significant factor in the determination of the number of MSMEs.
- vi. The availability of credit, education and the information are more consistent and important factor in the development of the entrepreneurship in any region either in the form of factories or in the form of MSMEs.

vii. The panel regressions indicate that the differences in institutional quality between the states of India are significant in determining the differences in entrepreneurship among them in terms of the number of MSMEs.

Thus, both the objectives of the study: (1) To have an overview of the institutional environment differences across the states of India in the context of entrepreneurship and (2) To examine the relationship between the quality of institutions and the entrepreneurship in India across its states, are fulfilled through this study.

### **5.3 Conclusion**

Any generalization about India as a whole may have misleading information and conclusions. India is a combination of states with better institutional environment and quality which can attract investment as well as the states where the problems are worrisome. Every Indian state has its own strengths and weaknesses in terms of their institutional environment. Hence, indexes of each indicator in the form of sub-indices have an advantage of providing detailed information regarding potential differences, strengths, and weaknesses of the states. It may provide a room for development in each state.

Every state can improve its entrepreneurial climate and thereby entrepreneurial performance by addressing specific 'bottlenecks'. Even the leading states like Goa can improve its performance by addressing its specific problem of the security with a higher number of physical and economic crimes and lesser efficient system of police and judiciary. Similarly, among the weaker and poor institutional quality states the problem is in all sectors, but the priority sector is the opportunity.

A balance between the different areas and among the various indicators is desirable, but all of them cannot be achieved simultaneously. Therefore, the weak performances in a

particular area, that is, a bottleneck, should be concerned first because it has the negative effect on all the features.

The empirical evidences suggest that the differences in institutional quality scores can play a significant role in explaining the variations in the extent of entrepreneurial activities across the Indian states. Various statistical and econometric techniques used for the analysis indicate that the entrepreneurial activities through the means of enterprises are consistently associated with the institutional environment of the states. The estimated coefficients of the institutional quality scores are always significant, whether it is the case of the factories or the case of the registered MSMEs. Though infrastructure variables have a positive influence on the entrepreneurship, they do not decline the significance of the quality of institutions. Even the presence of the factories does not turn down the importance of the better institutional environment in the case of MSMEs in India. Statistically speaking, the explanatory power of institutional quality scores regarding entrepreneurial activities is reasonably good as judged by the various tests of significance.

On the basis of the empirical evidences it can be demonstrated that a larger market size, better legal structure and security environment, as well as better availability of the credit, education, and information together tend to increase entrepreneurship. Good qualities of these institutional variables collectively foster an entrepreneurial climate conducive for the entrepreneurship development which pushes the states with better institutional environment ahead of others in terms of the different measures of the entrepreneurship. Therefore, the states with better quality of the institutional environment may have more numbers of formal and registered enterprises; while the states with the weaker institutional environment have a lesser development of the entrepreneurship.

The study finds empirical support in favour of institutional reform for entrepreneurship development. Improvement in the various determinants of the institutional environment may considerably improve the entrepreneurship scenario of a state or region. Therefore, a better institutional environment and better quality of the institutional variables are always required for the development of the entrepreneurship.

#### **5.4 Policy Suggestions**

The interstate variation of the institutional variables or regional traits is significant and the institutional environment differences of the states have a significant contribution in the determination of the different level of entrepreneurship across the Indian states. Policymakers should consider these potential differences. Every state has its own weaknesses and separate concerns. One policy and action in all the states may provide different results depending upon the institutional strengths or weaknesses of the various states. Any policy or recommendations which would be applicable for one state may not be relevant for others. For example, if the availability of higher level of education constitutes a bottleneck in a particular state, it cannot easily be substituted by increasing the GDP of the region.

Acs and Szerb (2010, 2015) have mentioned the relevance of two closely related theories, Theory of Weakest Link (TWL) and Theory of Constraints (TOC) concerning the importance of such detailed information which indicates the strengths and weaknesses of the institutional variables or regional traits across the regions/states or countries. These two theories, which are mainly applied in production and operation management, argue that if the various indicators/areas are out of balance, development is inhibited and improvement can only be achieved by removing the weakest link that constrains the performance of the whole system. Thus, in the context of entrepreneurship, it implies that entrepreneurship development in any state depends on

improving the binding institutional barriers and can be achieved by improving the worst performing indicator/variable. Consequently, detailed information on each state and each indicator is useful in understanding the institutional environment of the states, their differences with other states and their bottlenecks. According to which an effective policymaking can be done rendering the various needs and concerns of the states.

It is also signified that the better institutional environment may tend to increase the entrepreneurial activities in the form of industries (factories) and MSMEs. Thus, there is always a requirement for the institutional reform for any type of entrepreneurship development. States can improve their entrepreneurship performances by improving their institutional environment in general and their 'bottlenecks' specifically. Other measures for the entrepreneurship policy should always be supplemented by the measures of institutional reform and the institutional reform can be achieved through specific variables like urbanisation, credit reform, security, an increase in the GER, etc. Policy initiatives should focus on the general environment (institutional environment) and subsequent initiatives of the business incubation centres would then channelize the entrepreneurial capabilities of the states.

### **5.5 Scope for Future Research**

The thesis has attempted to address many issues related to the institutional environment differences across the Indian states and their role in the entrepreneurship development. Still, some areas could be identified which leaves the scope for the future research.

The study is constrained by commensurate data. As recognized in the study, specifically in chapter three (3), some institutional variables or regional traits (like political/policy stability, social institutions, and government size), which are important in the context of entrepreneurship, could not be included while measuring the institutional environment

for the Indian states because of the lack of availability of the data. These variables could not be captured while measuring the institutional environment differences across the Indian states in the lack of the appropriate proxies or data. The inclusion of these variables may enrich the analysis and provide a broader picture of the institutional differences in the context of entrepreneurship.

The study tried to overcome the problem of the small sample size by using bootstrap regression and between effect panel analyses. However, it could be made better by availing the information for the longer period of time.

The two measures for entrepreneurship (number of factories and number of MSMEs) present a static view of entrepreneurship as the number of enterprises within a region or state is a stock variable. It reflects past economic activity as well as current conditions; therefore, it may either understate or overstate the entrepreneurial activities of a region. Thus, these measures for the entrepreneurship are inadequate in measuring the total level of entrepreneurship across the states. There is a scope for improvement by using more and better proxies. Moreover, these proxies do not reflect the ages of the enterprises. Therefore, the evolutionary approach of the study of the institutions and the measures of entrepreneurship may add a significant contribution to the study of entrepreneurship in India. There are possibilities of having some more understanding of the entrepreneurship differences in Indian states if the historical and evolutionary development of the institutional environment and entrepreneurship, as well as economic development of the states is studied separately.

In the future research, analysing the micro, small and medium enterprises separately may provide a better understanding of the entrepreneurship scenario across the various Indian states and its relationship with the institutional environment. The behaviour and

responses of all these enterprises may be different depending on their size and environment.

The variation of labour regulations across the various states of India may play an important role in the determination of entrepreneurial activities, but could not be included in the study in the lack of appropriate proxies for that. Capturing the differences in labour regulations between the states may provide a better insight.

The data of some variables (like sources of information) are not available for all the concerned years; therefore, they are used as same for all the years. Thus, they are unable to provide the real differences across the states over the time.

The study can be enhanced in its impact and quality by supplementing with the primary survey of the states regarding peoples' perception of the opportunity, security and availability condition for the entrepreneurial activities in their states.

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## Appendix A

### Structure of Institutional Quality Index

Sub-Index	Pillar Indicators	Variables/Proxies	Source of Data	
<b>Institutional Quality Index</b>	<b>Index of Opportunity</b>	Market Size	*Per Capita NSDP X **Urbanisation	* Central Statistics Office (CSO) **Selected Socio-Economic Statistics India, 2011, Available at: <a href="http://www.mospi.gov.in">www.mospi.gov.in</a> and : <a href="http://niti.gov.in">http://niti.gov.in</a>
	<b>Index of Availability</b>	Credit	Credit/Deposit Ratio	RBI, India
		Education	Gross Enrolment Ratio in Higher Education (18-23 Years)	All India Surveys of Higher Education, Ministry of Human Resource Department (MHRD), Government of India.
		Information	(Percentage of households having a computer/laptop with internet × Percentage of households having television × Percentage of households having radio/transistor)	Data-book for Use of Deputy Chairman, Planning Commission, Government of India, 10th March 2014 (based on Census 2011). Available at: <a href="http://planningcommission.gov.in">http://planningcommission.gov.in</a>
	<b>Index of Security</b>	Rule of Law	a) Inverse of the Crime Rate of the Crimes against Body b) Inverse of the Rate of the Crimes against property c) Inverse of the Rate of the Economic Crimes d) Inverse of the Rate of the Crimes against public order e) Pendency Percentage of IPC Cases by Police f) Pendency Percentage of IPC Cases by Courts g) Recovery Percentage of the Stolen Property	National Crime Records Bureau (NCRB) of the Ministry of Home Affairs, Government of India.



## Appendix B

### Institutional Environment and Number of factories

#### 1.1 Cameron & Trivedi's decomposition of IM-test

Source	Chi 2	df	p
Heteroskedasticity	7.79	14	0.9002
Skewness	1.67	4	0.7969
Kurtosis	0.92	1	0.3371
Total	10.37	19	0.9431

#### 1.2 Tests of Multicollinearity

estat vif		
Variable	VIF	1/VIF
Surfaced road	1.41	0.706970
Power supply	1.11	0.903346
Institutional Quality	1.38	0.723805
Bureaucracy	1.09	0.916971
----- Mean VIF   1.25-----		

### 1.3 Tests of Endogeneity (using Market Size as instrument to institutional quality scores)

```
.ivregress 2sls factoriespermillionpopulation road (institutionalquality =marketsize)
      (Output Omitted)
```

Instrumented: institutional quality

Instruments: road marketsize

```
. estat endogenous
```

Tests of endogeneity

Ho: variables are exogenous

Durbin (score) chi2 (1) = 2.23364 (p = 0.1350)

Wu-Hausman F (1, 24) = 1.90304 (p = 0.1621)

### 1.4 Robust OLS of Factories on Explanatory variables

	Robust					
factoriesper~n	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
powersupply	3.423629	2.585046	1.32	0.198	-1.923947	8.771205
surfacedro~m	0.058793	0.3014068	0.20	0.847	-.5647144	.6823004
bureaucracy	0.9979024	5.718006	0.17	0.863	-10.83069	12.8265
institutio~y	1083.031	208.2147	5.20	0.000	652.3056	1513.755
_cons	-52.34568	49.42767	-1.06	0.301	-154.5946	49.90325



## 1.6 Bootstrap Linear Regression (1500) Replications

Linear regression                      Number of obs    =    28

Replications                      =    1500

Wald chi2 (4)                      =    29.74

Prob > chi2                      =    0.0000

R-squared                         =    0.5859

Adj R-squared                      =    0.5139

Root MSE                         = 102.0769

---

	Observed	Bootstrap	Normal-based			
factoriesp~n	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
institutio~y	1083.031	221.9555	4.88	0.000	648.0057	1518.055
powesupply	3.423629	3.669102	0.93	0.351	-3.76768	10.61494
surfacedro~m	0.058793	0.3602815	0.16	0.870	-0.6473458	0.7649318
bureaucracy	0.9979024	56.242	0.02	0.986	-109.2344	111.2302
_cons	-52.34568	54.75888	-0.96	0.339	-159.6711	54.97975

---

## 1.7 Hausman Specification Test (Fixed or Random)

hausman fixed random

---- Coefficients ----

	(b)	(B)	(b-B)	sqrt (diag(V_b-V_B))
	fixed	random	Difference	S.E.
instqlt	-73.21656	413.7894	-487.006	160.6416
road	0.8030757	0.7722543	0.0308214	0.1086481
power	-0.4934645	0.2269703	-0.7204348	0.2384041

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\chi^2(3) = (b-B)[(V_b-V_B)^{-1}](b-B)$$

$$= 21.47$$

$$\text{Prob}>\chi^2 = 0.0001$$

### 1.8 Fixed-effects (within) Regression

Number of obs = 84

Group variable: state Number of groups = 28

R-sq: within = 0.2447 Obs per group: min = 3

between = 0.1505 avg = 3.0

overall = 0.1577 max = 3

F(3, 53) = 5.72

Corr(u<sub>i</sub>, Xb) = 0.0251 Prob > F = 0.0018

---

factories	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
instqlt	-73.21656	216.2244	-0.34	0.736	-506.9078	360.4747
road	0.8030757	0.2064714	3.89	0.000	.3889466	1.217205
power	-0.4934645	1.346202	-0.37	0.715	-3.193603	2.206674
_cons	99.13485	54.84972	1.81	0.076	-10.87976	209.1495

---

sigma_u	123.02292	sigma_e	41.279687
rho	0.89880351 (fraction of variance due to u <sub>i</sub> )		

---

### 1.9 AIC and BIC values of Fixed Effect Regression

estat ic

---

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	84	-424.1458	-412.3599	4	832.7198	842.4431

---

### 1.10 AIC and BIC values of Between Effect Regression

estat ic

---

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	84	-176.2413	-163.3729	4	334.7459	344.4691

---



## Appendix C

### Institutional Environment and Number of MSMEs

#### 2.1 Cameron & Trivedi's decomposition of IM-test

Source	Chi 2	df	p
Heteroskedasticity	24.16	20	0.2357
Skewness	7.64	5	0.1769
Kurtosis	1.96	1	0.1612
Total	33.76	26	0.1411

#### 2.2 Tests of Multicollinearity

estat vif		
Variable	VIF	1/VIF
-----+-----		
Surfaced road	1.93	0.519387
Power supply	1.32	0.756928
Institutional Quality	2.94	0.340565
Factories	2.52	0.397041
Bureaucracy	1.46	0.686577
----- Mean VIF   2.03-----		

### 2.3 Tests of Endogeneity (using Market Size as instrument to institutional quality scores)

```
.ivregress 2sls MSMEspermillionpopulation road (institutionalquality =marketsize)  
      (Output Omitted)
```

```
Instrumented:  institutional quality
```

```
Instruments:  road marketsize
```

```
. estat endogenous
```

Tests of endogeneity

Ho: variables are exogenous

Durbin (score) chi2 (1) = 0.253611 (p = 0.6145)

Wu-Hausman F (1, 24) = 0.219368 (p = 0.6437)





## 2.5 Bootstrap Linear Regression (1500) Replications

Linear regression                      Number of obs    =    28

Replications                      =    1500

Wald chi2 (5)                      =    38.88

Prob > chi2                      =    0.0000

R-squared                         =    0.5487

Adj R-squared                      =    0.4462

Root MSE                         = 5743.2491

---

	Observed	Bootstrap	Normal-based			
	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
msmes						
institutio~y	52803.72	30332.58	1.74	0.082	-6647.036	112254.5
factories	5.670931	17.91752	0.32	0.752	-29.44677	40.78863
powersupply	8.516682	145.0219	0.06	0.953	-275.721	292.7543
surfacedro~m	7.036151	30.25536	0.23	0.816	-52.26327	66.33558
bureaucracy	-5579.956	19283.02	-0.29	0.772	-43373.98	32214.07
_cons	-2093.632	2517.506	-0.83	0.406	-7027.853	2840.588

---

## 2.6 Hausman Specification Test (Fixed or Random)

hausman fixed random

---- Coefficients ----

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
instqlt	-61342.23	-2224.628	-59117.6	36343.14
road	126.9132	34.75937	92.15379	51.56803
power	-167.2696	-134.7788	-32.49075	315.7604
factories	40.59321	20.61273	19.98048	25.12014

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\chi^2(4) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 16.64$$

$$\text{Prob}>\chi^2 = 0.0023$$

## 2.7 Fixed-effects (within) Regression

Number of obs = 56

Group variable: state Number of groups = 28

R-sq: within = 0.4981 Obs per group: min = 2

between = 0.1333 avg = 2.0

overall = 0.2068 max = 2

F(4, 24) = 5.95

Corr(u<sub>i</sub>, Xb) = -0.738 Prob > F = 0.0018

factories	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
instq1t	-61342.23	38189.38	-1.61	0.121	-140161.2	17476.77
road	126.9132	53.88736	2.36	0.027	15.69512	238.1312
power	-167.2696	340.2546	-0.49	0.627	-869.5205	534.9814
factories	40.59321	26.65494	1.52	0.141	-14.41989	95.60631
_cons	2865.559	10329.16	0.28	0.784	-18452.78	24183.9

sigma\_u | 7364.5374      sigma\_e | 6010.0012

rho | 0.60024897 (fraction of variance due to u<sub>i</sub>)

## 2.8 AIC and BIC values of Fixed Effect Regression

estat ic

---

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	56	-562.3015	-543.002	5	1096.005	1106.131

---

## 2.9 AIC and BIC values of Between Effect Regression

estat ic

---

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	56	-274.096	-262.1777	5	534.3554	544.4822

---



## PUBLICATIONS AND CONFERENCES

Results of the Thesis has been published in various forms:

### I. Journal Publication

- (i) Kumar, G. and Borbora, S. (2017), “Institutional Environment Differences Across the Indian States for Entrepreneurial Development”, *Review of Integrative Business and Economics Research*, Vol. 6, No. 4, pp. 50-69.
- (ii) Kumar, G. and Borbora, S. (2016), “Facilitation of Entrepreneurship: The Role of Institutions and the Institutional Environment”, *South Asian Journal of Management*, Vol. 23, No. 3, pp. 57-77.

### II. Conferences

- i) The paper titled “Role of Institutional Environment in Creating Employment Opportunities” by Kumar, G. and Borbora, S. presented at the National Conference on Indian Economy: Contemporary Issues and Challenges organised by Department of Business Economics, University of Delhi (February 28<sup>th</sup>, 2017).
- ii) The paper titled “Sub-National Institutional Environment for Entrepreneurship in India” by Kumar, G. and Borbora, S. presented at the 12<sup>th</sup> International Research Conference on Quality, Innovation and Knowledge Management at the Le Meridien Hotel, New Delhi, India organised by Monash Business School (February 14 to February 17, 2016).

