



## International Journal of Engineering, Business and Enterprise Applications (IJEBA)

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### THE LINK BETWEEN INSTITUTIONS AND INDUSTRIAL DEVELOPMENT: AN EMPIRICAL STUDY OF INDIAN STATES

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**Abstract:** Industrial development is closely linked to the existence of good institutions. Though the term 'institutions' covers a very wide spectrum, this paper considers the three major components of institutions- legal institution, state intervention as an institution and political institution. For better gauging the industrial development, two measures have been considered- percent growth in State Gross Domestic Product (SGDP) and the level of industrial development. This study empirically examines and suggests that the state intervention as an institution is significant in explaining the variations in SGDP growth whereas all three components of institutions play a highly significant role in explaining variations in the extent of industrial development across the Indian states.

**Keywords:** Institutions, Governance, Rule of Law, Legal Efficiency, Political Stability

#### I. INTRODUCTION

Development economics of different countries or different states tries to find out the answer of a basic question why different countries or different states within a country grow differently resulting into different degrees of income inequalities. Ayami (1997) discusses the cross country comparison and finds that governance and institutions which are country-specific factors, play a dominant role in determining the growth of a country. Even countries with similar resource endowments have experienced sharply different economic growth because of country-specific governance and organizations. Examples are North Korea versus South Korea, Kenya versus Tanzania, and India versus Pakistan.

A well maintained setup of institutions encourages components of economic development to participate in fair and productive economic activities and discourages rent-seeking and illegal activities in an economy. Poor institutions force the economy to a low-level equilibrium due to the disincentives created by the non productive role of the economic agents (Dash and Raja, 2009). The literature that focuses on the role of a government or state maintains that the interventionist activity of the state influences the economic outcomes to a considerable extent (Buchanan and Tabellini, 2005). The enforcement of efficient legal institutions, protection of property rights and well-enforced rule of law have been recognized as prerequisite for economic prosperity.

The role of a state is gauged by two important performers: the existing quality of governance and the extent of state intervention in economic activities. The quality of governance can be judged by the enforcement of the rule of law, fiscal management, and expenditures on development-related activities (Schaefer and Raja, 2006). It is found that the state acts as a grabbing hand rather than a helping hand; it redistributes and appropriates the wealth instead of generating and protecting it. Thus, due to its self-interested character, if the governments were given policy powers that influenced the market, it would fail to bring about effective economic development (Kaufmann et.al., 2002). The political institutions of a nation determine its economic outcomes indirectly by influencing economic institutions (Acemoglu et.al., 2001). A politically unstable society makes investments risky and uncertain by frequently changing the Government and its decisions. Political instability discourages investments and productive economic activities (Barro, 1991, Alesina et.al., 1996, Brunetti and Weder, 1998, and Svensson, 1998). Empirical findings suggest that the extent of state intervention is significant in explaining the variations in state's SGDP growth whereas legal institutions and political institutions both play a significant role in explaining variations in the extent of industrialization across the states.

The paper is organized as follows: the following section is devoted to a discussion of the literature on the role of institutions in industrial development. The third section describes the objectives of this study. The fourth section contains data and the methodology used. The fifth section contains the empirical analysis and the results. The sixth section contains the discussion of the results and the conclusion.

#### II. THE LITERATURE REVIEW

The significant positive role of the institutions on the economic development have been established by a number of cross-country empirical studies in explaining the disparity in growth rate and standards of quality of life

across different countries over a time (Aron, 2000; Rodrik *et al.*, 2004; Hall and Jones, 1999; Clague *et al.*, 1999; Svensson, 1998; Levine, 1998; La Porta *et al.*, 1999; Mauro, 1995; Knack and Keefer, 1995 and 1997; Barro, 1991 and 1996; Scully and Slottje, 1991).

According to Chong and Calderon (2000), a country's institutional framework is an important factor for not only its economic performance but also the way, how income is distributed among its members. In many researches, information regarding the quality of institutions is generally taken from the international agencies like International Country Risk Guide (ICRG) and the Business Environment Risk Intelligence (BERI).

Most of the abovementioned studies suggest that economic performance can be guaranteed only when a country-specific institution is adopted successfully.

### **A. Institutions and Industrial Performance in India**

Poor institutions can restrict the economy from using efficient production techniques, which in turn would force the country to remain at the 'low-equilibrium' trap with low per capita income for a long time, which is the case in India until recently (Dreze and Sen, 1997).

Several interesting questions are raised based on this argument, about India's productive efficiency, technological progress and overall growth process during the pre-reform period of 1991. It may be noticed that the government industrial policy did not produce the expected results of increasing employment and reducing the interregional income disparity, though the industrial output increased as discussed by Rosen (1992).

To study the role of institutional qualities on the industrial performance it is necessary to understand the growth path followed by India over a number of years since independence. The basic organisational setup followed in India for its industrialisation process has been the heavy dependence on public sector units and a limited entry for new private sector firms and also to stop expansion of existing firms in the production of low priority areas. Capital goods such as Steel and Cement were given to public sector enterprises, while the other low priority productions such as consumer goods were given to private sector. Public sector industries instead of making profits have in fact added huge losses over the years. As a result, instead of being a source of reinvestible surplus, they have become only a source of liability to the economy. Lack of profitability in the public sector has been partly the result of a low rate of capacity utilization.

In conclusion, it may be stated that most of the study of institutions and economic performance across the Indian states has only been done with a view to ranking the Indian states and observing whether this ranking has stayed over time or changed. The use of perceptual indices, however, has many problems associated with it and may not give an accurate picture. The question of whether the perceptual indices correlate with the prevailing ideas on the institution-economic development linkage has not been studied so far. Using fiscal deficit as an indicator of fiscal governance would also show misleading results; hence, under index of fiscal governance, different variables are required to be considered. This paper is an attempt to answer these issues and raise striking questions on the role of governance and the linkages between institutions and economic performance.

## **III. OBJECTIVE OF THE STUDY**

Most of the earlier research works, on institutions and industrial development across the Indian states, have been performed either with a view to ranking the states or to observe whether this ranking has changed over time. Though the method using perception indices has many problems associated with it, however whether these indices correlate significantly with the industrial development, has not been studied so far. This study is as an attempt to fill this gap and raise pertinent questions on role of different institutions in industrial development. Consequently the objective of this study is framed to study the role of different components of institutions in industrial development of the Indian states by analysing the significance levels of the co-efficient values, using multiple OLS Regression techniques.

## **IV. THE DATA AND METHODOLOGY**

In this paper four most economically developed Indian states have been considered from each of the four zones of India namely West Bengal from East Zone, Maharashtra from West Zone, Punjab from North Zone and Tamilnadu from South Zone. Jharkhand state has been considered as an additional state as it endows almost 37 percent of minerals of India with a considerable industrial setup<sup>1</sup>. But the level of industrialization has not translated into high levels of income for Jharkhand<sup>2</sup>.

In this process various proxies are used to find out how significant is the components of the Institutions-i) Legal institutions, ii) State intervention as an institutions and iii) Political Institutions, over three dimensions of economic development namely per capita income, percentage growth in SGDP and level of industrialisation, which are collected from various secondary data sources. To perform this cross-sectional study, data for the time period of seven years (from 2004-05 to 2010-11) have been collected. Seven proxies of institutions are used to capture three dimensions of the institutional aspects in the economic activities. This paper formulates institutional indices based on secondary data for the time period of seven years (from 2004-05 to 2010-11) and uses statistical

methods to test the hypothesis that institutions affect economic performance. This method however ignores the issues that are associated with obtaining information that is perception-based (Aron, 2000).

The common problem for such type of cross-section analysis is multicollinearity. Principal component analysis (PCA) is used to solve this problem. PCA is applied to the proxies who are having high correlation amongst each other. Since the units of measurement of different correlated variables are different, the rotated correlation matrix is used to get the corresponding weight.

After standardizing the data, it is multiplied with the weight as suggested by PCA to arrive at the corresponding Indices or composite indices. Finally, three principal components are retained which have extracted 93.8 percent of variance of the dataset. The obtained weights are multiplied by the corresponding standardized values of the variables to arrive at the indices<sup>3</sup>.

Since the proxy of the Creditors' Property Rights Protection receives the highest weight in the first principal component, the resulting index is named the Index of Property Rights. The second highest weight in the first component is for Average Disposal rate of cases per court, for which the resulting index is named Index of Legal Efficiency.

Similarly, the second principal component suggests for the three indices-named as i) the State as a provider of necessary infrastructure- a combination of two variables -named surfaced road as a proportion of total roads and percentage of households having access to a telephone , ii) Index of Economic Freedom-which is a measure of total Govt. Expenditure as a percentage of SGDP and iii) Index of Fiscal Governance- prepared combining two variables named revenue expenditure as a percentage of total expenditure and interest payment as a percentage of total expenditure.

The third principal component, which has the highest weight to Transmission and Distribution (T&D) Loss considered as a proxy for the Index of Rule of Law. The second highest weight in third component is for the number of times the president's rule imposed which when combined with the next highest value for coalition government generates the Index of Political Stability.

The resulting seven indices no longer have the problem of multicollinearity and can be used together in a regression equation. The details of the dependent and independent variables are discussed in the next sections.

<sup>1</sup>Source: Jharkhand.gov.in/industry

<sup>2</sup>World Bank Report no. 36437-IN; Jharkhand: Addressing the challenges of inclusive developments

<sup>3</sup>For details refer the tables in Annexure-I.

### A. The Dependent Variables

For better understanding and proper gauging the industrial development of states, two dimensions of it are considered based upon the following justifications-

(i) *Percentage SGDP growth rate* among the states is the first variable considered. This is an overall measure of development of states and is used routinely in many studies. This is a measure of the comparative percentage growth year wise, of the state GDP, in different states, reflecting the economic growth rate. The set of institutions is regressed over this variable and the results are discussed in Model-1.

(ii) *Index of industrial development* is considered as the second variable because the extent of industrialization has significant linkage effects that influence the level of economic development. It is measured as the ratio of the contribution of the secondary sector to total state GDP. The set of institutions is regressed over this variable and the results are discussed in Model-2.

### B. Selection of the Proxies and the Formulation of the Indices to be referred for independent variables

The components of institutions and the justified selection of the corresponding proxy variables are discussed in Table 1.1.

| Table 1.1: Institutions and the Selection of the Proxies |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Institutions                                             | Components of the Institutions | Description of the Proxy Variables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1. Legal Institutions                                    | 1 a) Index of Legal Efficiency | • <i>Disposal rate of cases per court</i> has been considered as a proxy which covers the efficiency level of the legal institutions. A higher value is an indication that pendency is less with a quicker disposal of cases resulting into prevention of productive activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                          | 1 b) Index of Property Rights  | It is the measure of the degree of risk that banks face across the states. one of the aspects of property rights which is considered as a proxy for this study is the <i>Credit-deposit ratio of commercial banks</i> . The credit deposit (CD) ratio is a measure of the effectiveness of the credit delivery system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                          | 1 c) Index of Rule of Law      | This is a perception institution and most of the cross country studies have used the rule of law indices prepared by international agencies like ICRG, BERI and the World Bank. This study has used <i>Transmission and distribution (T &amp; D) loss as a percentage of total generation</i> as a proxy for rule of law with the following justification-<br>T & D losses occur due to two reasons- (i) loss due to transmission which is a technical phenomenon and (ii) loss due to theft which is mainly due to illegal connection of electricity from the transmission. If it is assumed that the loss due to technical reasons would be uniform throughout the state as the technology of generation and distribution does not vary significantly across the country. If the rule of law will be poorer, the probability of being caught will be very low and people will find |

|                                          |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |                                                               | that power theft is very easy. Hence this can be taken as a proxy for rule of law.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2. State Intervention as an Institutions | 2 a) Index of Economic Freedom                                | This index reflects the extent to which the state is involved in economic activities. The proxy considered for this index is the <i>Ratio of total expenditure to state gross domestic product (SGDP)</i> . A high value of the ratio of total expenditure to state gross domestic product (SGDP) shows greater extent of intervention of state in various economic activities which may result into more scope of corruption or rent seeking.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                          | 2 b) Index of Fiscal Governance                               | A poor fiscal governance may not attract the the private economic agents for the productive economic activities. Two proxy variables are considered to capture this index-<br>(i) <i>Revenue expenditure as a percentage of total expenditure</i> - a high ratio value indicates that more resources are utilised for generating revenue which is redistributive for the development of the state. a low value indicates an inefficient utilization of the resources and a poor fiscal management.<br>(ii) <i>Interest payments as a percentage of total expenditure</i> - if a large amount is devoted to the interest payments on debts, then few amount is left for the development activities reflecting a poor fiscal management of the state.                                                                                                                                                                                                                                                                                        |
|                                          | 2 c) Index of State as a provider of Necessary Infrastructure | The role of infrastructure in industrial development and hence in economic outcomes is well established by various studies. Two variables are considered to capture this-<br>(i) <i>Ratio of surfaced (paved) roads to total roads</i> . This indicates the quality of road infrastructure and a higher ratio represents the maintenance of good transport facilities by the state. A developed road infrastructure reduces the total transaction costs of economy by saving time and minimizing transportation costs, which attracts the investment projects.<br>(ii) <i>Percentage of the population accessing telephone connections</i> .<br>An efficient telecommunications system will reduce the costs of communication and will make transactions cheaper and quicker.                                                                                                                                                                                                                                                              |
| 3. Political Institutions                | Index of Political Stability                                  | Two variables are used in order to capture the political scenario of major Indian states.<br>• <i>Number of times the President's rule was imposed</i> . The imposition of the President's rule indicates a poor political scenario in a state. President's rule is generally imposed when none of the political parties gets a majority or if the party in power fails to maintain law and order in the state. If this happens frequently, then a state will fail to attract economic investors and economic outcomes will always be unsatisfactory<br>• <i>Number of times the Chief Ministers headed a coalition form of government</i> . The main problem with a coalition government is that it is not necessarily stable and mere for survival of the coalition government development in all fields are sacrificed by the politicians. Reversal of policies may create an environment which distracts the investment scenario. Hence a high value will suggest high degree of political instability resulting into less development |

## V. EMPIRICAL ANALYSIS AND THE RESULTS

### A. Regression Results

Multiple ordinary least squares regression analysis is used to analyse the statistical significance level of the different indices formulated for quality of institutions and to explain the variations in the percentage growth in SGDP and level of industrialisation across the states. The results are discussed in Table 1.2.

| Table 1.2: Regression Results                           |                        |                       |
|---------------------------------------------------------|------------------------|-----------------------|
|                                                         | MODEL 1                | MODEL 2               |
| Dependent Variables                                     | SGDP                   | LID                   |
| Independent Variables                                   |                        |                       |
| Index of Legal Efficiency                               | -0.7319<br>(-0.5716)   | -1.359<br>(-2.346)**  |
| Index of Political Stability                            | -1.997<br>(-0.678)     | 4.807<br>(3.6068)***  |
| Index of Rule of Law                                    | 8.755<br>(1.754)*      | 9.836<br>(4.355)***   |
| Index of Property Rights Protection                     | 3.215<br>(3.311)***    | 4.486<br>(10.212)***  |
| Index of State as a provider of infrastructure services | 0.603<br>(0.485)       | 2.775<br>(4.937)***   |
| Index of Fiscal Governance                              | 178.89<br>(2.769)**    | 63.683<br>(2.179)**   |
| Index of Economic Freedom                               | -259.66<br>(-2.848)*** | -97.314<br>(-2.359)** |
| Intercept                                               | 7.038***<br>(8.173)    | 15.06***<br>(24.424)  |
| R-Squared                                               | 0.5937                 | 0.917                 |
| Adjusted R-Squared                                      | 0.4264                 | 0.883                 |
| F-Statistics                                            | 3.549*                 | 26.776***             |
| Degree of Freedom                                       | (7,5)                  | (7,5)                 |

**Abbreviations:** SGDP: Percentage Growth in State Gross Domestic Product, LID: Level of Industrial Development

**Notes:** The figures below coefficient measures within parenthesis are the t-statistics values

\*\*\* Significant at 1% significance level

\*\* Significant at 5% significance level

\* Significant at 10% significance level

The results in Model 1 suggest that it is a weak model as reflected by the comparative low value of adjusted  $R^2$  which explains only 59.4 percent variations. The major finding of this model is the Index of Property Rights which is highly significant and the Index of Fiscal Governance which is significant at 10 percent significance level showing the positive correlation with the degree of state intervention in economic performance.

In Model 2, the set of institutions are regressed over level of industrial development and it is found to be satisfying all the criteria of a good fit model with a very high explanatory power covering around 88.3 percent variance in it. The Indices of Political Stability, Rule of Law, Property Rights and State Infrastructure do affect the level of industrial development and hence the overall economic performance of the states, suggested by the positive values of coefficients, is highly significant at 1 percent level of significance. In this model Index of Fiscal Governance is also significant at 10 percent level of significance showing that states cannot overlook or ignore this for a better level of industrialisation.

Surprisingly the Index of Legal Efficiency and Index of Economic Freedom both have negative signs in Model 2, which is against the expectations but the values are significant at 5 percent level of significance suggesting these indices somehow do affect the level of industrial development in the states considered.

The intercept in both models are also highly significant suggesting the initial level of economic growth is positively influenced by both the models considered and hence by all the components of institutions.

## VI. DISCUSSION OF THE RESULTS AND CONCLUSION

From the results it could be concluded that institutional qualities and the quality of governance do play a role in explaining the economic performance across the states under consideration. The institutions play a significant role in explaining the variations in the level of industrialisation (Model 2) as well as in percentage growth in SGDP (Model 1) of the states. However if political stability, rule of law and state as a provider of necessary infrastructure are removed from the analysis then property rights emerge as a significant factor influencing the economic development. This suggests that while institutional qualities play a strong role in economic development but are overshadowed by quality of governance e.g. political stability, rule of law and state as a provider of necessary infrastructure.

The measure of quality of governance as the political stability has a very strong effect on the level of industrial development. It is assumed that a state with low political stability where there is a rule of coalition govt, face a lot of difficulties in implementing the policies since the political interests of different political parties don't match. All the policies and development are sacrificed only for survival of a coalition government, and enjoying their own political benefits and thus the government works for its own interests rather than in the interests of the people at large. However, this is tested by a proxy variable in this analysis and cannot be controlled by any policy.

### A. The Policy Orientation

From a policy perspective it is suggested that the states should spend on developmental expenditures rather than on non-development expenditures. Low quality of institutions would create a lot of obstacles in realizing the true potential of the states and must not be ignored. The development of the states depends heavily on how efficiently resources are used which is further determined by the quality of governance and the prevailing policy environment.

Good governance affects the growth and development in manifolds. First, it affects the effectiveness of the public and private sector developmental programmes in the state. Poor administration and mismanagement are now widely accepted as the factors reducing the effectiveness of many government programmes. The general 'law and order' –broadly covered by 'rule of law' and 'legal efficiency' is highly responsible factor of governance which creates an environment conducive to investment. A better rule of law and faster disposal rates by courts and police would certainly have a positive correlation with the development of the states. The result of good governance will facilitate the infrastructure development which itself is the welcoming door for many other developments in various sectors.

Another channel through which the growth of the state can be stimulated using the quality of governance at the state level is by making the policy environment more business friendly. A new entrepreneur setting of an industrial unit needs thirty separate permissions from different departments responsible for state level clearances, e.g. those related to environment regulations, utilities, health, sanitary and safety inspection, labour welfare regulation, sales tax, etc. The positive development in recent times is that many states have taken initiatives in this area and have introduced simplified procedures and single-window arrangements to improve the business climate. However these are very recent initiatives and the lead has been taken only by the better performing states. Such type of reforms in the regulatory system is highly needed for the speedy development of the states.

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### ANNEXURE-I

**Table: 1.3: Correlation Matrix, before applying Principal Component Analysis (PCA)**

Notes: Figures in parentheses represent probability levels

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

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

|           | AVG_DISPO         | PRESI_R          | COALI_G          | TDLOSS            | CD_R              | SUR_ROAD        | TELE_HH        | REV_EXP          | INT_PAY          | TOTAL_EXP |
|-----------|-------------------|------------------|------------------|-------------------|-------------------|-----------------|----------------|------------------|------------------|-----------|
| AVG_DISPO | 1                 |                  |                  |                   |                   |                 |                |                  |                  |           |
| PRESI_R   | .136<br>(.518)    | 1                |                  |                   |                   |                 |                |                  |                  |           |
| COALI_G   | -.137<br>(.514)   | .556**<br>(.004) | 1                |                   |                   |                 |                |                  |                  |           |
| TDLOSS    | -.187<br>(.371)   | .402*<br>(.046)  | .625**<br>(.001) | 1                 |                   |                 |                |                  |                  |           |
| CD_R      | .586**<br>(.002)  | .034<br>(.872)   | -.074<br>(.723)  | -.253<br>(.223)   | 1                 |                 |                |                  |                  |           |
| SUR_ROAD  | -.885**<br>(.000) | -.218<br>(.295)  | .071<br>(.736)   | .065<br>(.758)    | -.547**<br>(.005) | 1               |                |                  |                  |           |
| TELE_HH   | .514*<br>(.010)   | -.370<br>(.075)  | -.489*<br>(.015) | -.728**<br>(.000) | .214<br>(.315)    | -.389<br>(.061) | 1              |                  |                  |           |
| REV_EXP   | .154<br>(.462)    | .021<br>(.920)   | .116<br>(.581)   | -.028<br>(.894)   | -.161<br>(.442)   | -.146<br>(.486) | .332<br>(.113) | 1                |                  |           |
| INT_PAY   | .074<br>(.725)    | -.050<br>(.814)  | -.083<br>(.693)  | -.183<br>(.380)   | -.172<br>(.412)   | -.091<br>(.667) | .238<br>(.264) | .875**<br>(.000) | 1                |           |
| TOTAL_EXP | .153<br>(.466)    | .016<br>(.941)   | .100<br>(.634)   | -.041<br>(.845)   | -.166<br>(.428)   | -.147<br>(.482) | .329<br>(.116) | .999**<br>(.000) | .895**<br>(.000) | 1         |

**Abbreviations;** AVG\_DISPO, Average Disposal rate of cases per court; PRESI\_R, number of times the President's Rule was imposed ; COALI\_G, number of times the CM headed a coalition form of government ; TDLOSS, Transmission & Distribution Loss as a percentage of generation ; CD\_R, credit-deposit ratio of commercial banks across the states ; SUR\_ROAD, ratio of surfaced roads to total roads ; TELE\_HH, percentage of population accessing telephone connections ; REV\_EXP, revenue expenditure as a percentage of total expenditure ; INT\_PAY, interest payment as a percentage of total expenditure ; TOTAL\_EXP, ratio of total expenditure as percentage of total state gross domestic product (SGDP)

**ANNEXURE-I- continued**  
**Table 1.4: Weights Assigned after applying PCA**

|                                               | Rescaled Component |       |       |
|-----------------------------------------------|--------------------|-------|-------|
|                                               | 1                  | 2     | 3     |
| AVG_DISPO                                     | .853               | .233  | .214  |
| PRESI_R                                       | .055               | -.238 | .513  |
| COALI_G                                       | -.166              | -.315 | .363  |
| TDLOSS                                        | -.317              | -.489 | .522  |
| CD_R                                          | .889               | -.379 | -.245 |
| SUR_ROAD                                      | -.866              | -.187 | -.460 |
| TELE_HH                                       | .477               | .781  | -.383 |
| REV_EXP                                       | .037               | .553  | .049  |
| INT_PAY                                       | -.014              | .486  | .096  |
| TOTAL_EXP                                     | .034               | .557  | .059  |
| Statistics                                    |                    |       |       |
| Eigenvalues                                   | 2.531              | 1.816 | 1.522 |
| Percentage of variance extracted (Cumulative) | 59.4               | 81.4  | 93.8  |

**Abbreviations;** AVG\_DISPO, Average Disposal rate of cases per court; PRESI\_R, number of times the President's Rule was imposed ; COALI\_G, number of times the CM headed a coalition form of government ; TDLOSS, Transmission & Distribution Loss as a percentage of generation ; CD\_R, credit-deposit ratio of commercial banks across the states ; SUR\_ROAD, ratio of surfaced roads to total roads ; TELE\_HH, percentage of population accessing telephone connections ; REV\_EXP, revenue expenditure as a percentage of total expenditure ; INT\_PAY, interest payment as a percentage of total expenditure ; TOTAL\_EXP, ratio of total expenditure as percentage of total state gross domestic product (SGDP)

**ANNEXURE-I- End**  
**Table 1.5: Correlation Matrix, after applying Principal Component Analysis (PCA)**

|               | I_LEG_EFFI       | I_POLI_STAB      | I_RULE_LAW      | I_PROP_RIGHT     | I_STATE_INFRA   | I_FISC_GOV     | I_ECON_FRDM |
|---------------|------------------|------------------|-----------------|------------------|-----------------|----------------|-------------|
| I_LEG_EFFI    | 1                |                  |                 |                  |                 |                |             |
|               | -                |                  |                 |                  |                 |                |             |
| I_POLI_STAB   | .066<br>(.753)   | 1                |                 |                  |                 |                |             |
|               |                  | -                |                 |                  |                 |                |             |
| I_RULE_LAW    | -.186<br>(.373)  | .528**<br>(.007) | 1               |                  |                 |                |             |
|               |                  |                  | -               |                  |                 |                |             |
| I_PROP_RIGHT  | .586**<br>(.002) | -.023<br>(.911)  | -.253<br>(.223) | 1                |                 |                |             |
|               |                  |                  |                 | -                |                 |                |             |
| I_STATE_INFRA | -.745**<br>.000  | -.340<br>(.096)  | -.240<br>(.248) | -.476*<br>(.016) | 1               |                |             |
|               |                  |                  |                 |                  | -               |                |             |
| I_FISC_GOV    | .132<br>(.529)   | .042<br>(.843)   | -.078<br>(.711) | -.169<br>(.420)  | -.039<br>(.853) | 1              |             |
|               |                  |                  |                 |                  |                 | -              |             |
| I_ECON_FRDM   | .152<br>(.469)   | .070<br>(.739)   | -.041<br>(.845) | -.166<br>(.428)  | -.053<br>(.802) | .994**<br>.000 | 1           |
|               |                  |                  |                 |                  |                 |                | -           |

Notes: Figures in parentheses represent probability levels

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

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

**Abbreviations :** I\_LEG\_EFFI, Index of Legal Efficiency; I\_POLI\_STAB, Index of Political Stability; I\_RULE\_LAW, Index of Rule of Law; I\_PROP\_RIGHT, Index of Creditors' Property Rights; I\_STATE\_INFRA, Index of State as a provider of necessary Infrastructures; I\_FISC\_GOV, Index of Fiscal Governance; I\_ECON\_FRDM, Index of Economic Freedom.