INSTITUTIONS AND THE QUALITY OF GOVERNANCE: AN EMPIRICAL STUDY ON INTERSTATE DIFFERENCES IN ECONOMIC DEVELOPMENT IN INDIA

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Economic performance is closely linked to the existence of good institutions. However, the quality of governance has also been identified as an important factor that affects economic growth and development. This paper empirically examines the significance of these factors in explaining variations in the per capita GDP of the Indian states and the extent of industrialization across them. Towards this end, indices for institutions—such as the protection of property rights, the efficiency of the legal system at the state level and the rule of law—as well as indicators of the extent and quality of State intervention and political stability, have been constructed to bring them into an empirically testable format. Empirical findings suggest that the quality of governance is significant in explaining the variations in state per capita GDP. Institutional factors play a significant role in explaining variations in the extent of industrialization across the Indian states.

I. INTRODUCTION

A number of cross-country empirical works have shown the relative importance of institutions over other traditional measures, such as geographical proximity, historical advantage, physical capital, technical progress and human capital, in explaining the enormous differences in standards of living and growth rates across countries over a period of time (Scully and Slottje 1991; Barro 1991 and 1996; Knack and Keefer 1995 and 1997; Mauro 1995; La Porta and others 1999; Svensson 1998; Levine 1998; Hall and Jones 1999; Clague and others 1999;

Aron 2000; Rodrik, Subramanian and Trebbi 2004). The protection of property rights, the enforcement of contractual agreements, economic freedom, efficient legal institutions and well-enforced rule of law have been recognized as preconditions for economic prosperity. The argument is that overall institutional structures determine the incentive pattern and economic pay-offs to agents. A well-maintained institutional set-up encourages economic actors to participate in fair and productive economic activities and discourages rent-seeking and illegal activities in an economy. Poor institutions create disincentives for economic agents to act productively and force the economy to a low-level equilibrium.

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.[1] Broadly, the role of the State is viewed from two perspectives: the extent of State intervention in economic activities and the quality of governance. Governance broadly includes fiscal governance, as well, since it has an important role to play in deciding expenditures on both human developmental outcomes, such as health and education, and economic developmental outcomes, such as physical infrastructure. Interventions by the State are justified only if there are market failures that the State should address. Market failures associated with the provision of public goods and failures resulting in the control of "public bads", such as pollution, have been the areas in which State intervention was justified. However, various necessary goods, such as health, education, sanitation and banking services, which, if left to the market, would exclude the marginalized sections of society, are also instances where State intervention is advocated.[2] The quality of governance can be judged by the enforcement of the rule of law, fiscal management, and expenditures on development-related activities.[3] However, the views expressed by applied public choice theorists[4] argue that the State, like private individuals and/or firms, also maximizes its own interests rather than social welfare. The argument is that the State acts as a "grabbing hand" rather than

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[1]   Reviewing the literature on the role of the State is an arduous task. Frequently cited works are Buchanan and Musgrave 1999, Stiglitz 1989b and 1998, and Tabellini 2005.

[2]   This view was set forth most notably by Richard A. Musgrave and Joseph E. Stiglitz, both of whom have made a series of contributions to the literature. However, Musgrave (1959) and Stiglitz (1989) provide an overview of their contributions to the literature on market failure.

[3]   Many of the cross-country studies alluded to above show that a poor rule of law, corruption and weak contract enforcement mechanisms are associated with underdevelopment. The law and finance literature has documented the importance of financial development and fiscal management in promoting economic growth and development. For a compilation of this work, see Schaefer and Raja (2006).

[4]   Prominent contributions to the literature on public choice are provided by Downs (1957), Buchanan and Tullock (1962) and Olson (1965).

a "helping hand"; it redistributes and appropriates the wealth instead of generating and protecting it. Thus, due to its self-interested behaviour, if the Government were given policy powers that circumvented the market, it would fail to bring about effective economic development.[5]

The political institutions of a nation determine its economic outcomes indirectly by influencing economic institutions.[6] 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.[7]

To what extent do institutional differences, political stability and the quality of governance account for interstate variations in economic development across the states of India? This paper applies insights from the literature to answer this question. Towards this end, indices for institutions—such as the protection of property rights, the efficiency of the legal system at the state level and the rule of law—as well as indicators of the extent and quality of State intervention and political stability, are constructed to bring them into an empirically testable format. The study uses the standard ordinary least squares multiple regression technique to arrive at the results. The paper is organized as follows: The next section is devoted to a discussion of the literature on the role of institutions and the quality of governance in the subcontinent and on India, in particular, and identifies the gaps that this study attempts to fill. The third section contains the data and the methodology used. The fourth section contains the empirical analysis and the results. The fifth section discusses the robustness of the regression results. The sixth section contains the discussion of the results and the conclusion.

II. THE INDIAN AND REGIONAL PERSPECTIVE

Different institutional scholars have linked institutions with economic outcomes from different perspectives. Proponents of the new institutional economic literature, such as Douglas North, evaluate the role of institutions—particularly

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[5]   The recent failures of some transitional economies exposed the dark side of State interventions. Kaufmann, Kraay and Zoido-Lobatón (2002) argued that the negative impacts of the rampant bureaucratic corruption and the interest group capture due to State intervention outweigh the positive impacts. See Frye and Shleifer (1997) for a detailed discussion.

[6]   Acemoglu, Johnson and Robinson (2001) discuss this at length.

[7]   Important cross-country empirical studies, such as Barro (1991), Alesina and others (1996), Brunetti and Weder (1998), and Svensson (1998), have evaluated the significance of different political aspects from the perspective of economic performances.

contract enforcement and the protection of property rights—from a historical point of view. North (1989 and 1990) argues that the institutions are country-specific and path-dependent, and subsequently, that they determine the level of future economic pay-offs of the country, whereas scholars such as Bardhan (2004 and 2005) are more concerned about the problems caused by the existing *dysfunctional institutions* and their persistence in underdeveloped countries. The problems of fragmentation and coordination failures are endemic in the underdeveloped countries, and these factors are responsible for the existence of dysfunctional institutions, and the presence of dysfunctional institutions retards the economic outcomes of these countries. Stiglitz (1989a, 1989b and 1998) questions the belief that the market as an institution can take care of all problems. He discusses various types of market failures, particularly in the poorer countries, and advocates the role of a proactive State to redress problems caused by market failures.

Given this background, it would be worthwhile to explore both the role of institutions and the role of the State in assessing the economic performance of the Indian states. This is one of the main objectives of the paper. The role of institutions in the Indian context has been mentioned under three broad categories: democracy, the rule of law and an independent judiciary. Viewed in this context, India emerges as an outlier in cross-country studies, with a reasonably strong institutional base but poor economic performance (Rodrik and Subramanian 2005). The quantification of institutions in India was undertaken in a study by Subramanian (2007) in which the rule of law, legal efficiency and customs administration were taken as indicators of institutional quality or institutional outcomes. Perception-based measures were taken from previous cross-country studies. The broad general conclusion is that the core institutions of democracy and an independent judiciary have created the preconditions for economic growth, but that India could embark upon this growth only after an attitude change in the Government towards a pro-business policy. Reference has been made to variations in institutional quality across Indian states, but they have not been tested statistically.

The vast differences in economic performance, growth rates and levels of economic and social development across different Indian states are well documented. For example, the per capita income of Gujarat is four times higher than that of Bihar. Development indicators, such as the index of industrialization, also show a large variation. The more important question of whether institutional quality and the extent and quality of government activity in promoting economic growth are significant factors in explaining the variation in economic performance across the Indian states has begun to gain the attention of scholars only recently. The literature on this topic is limited to two studies, one by Indicus Analytics (2004) and one by Debroy and Bhandari (2004). Various institutional indices, such

as corruption, the rule of law, property rights, and the difficulty of doing business, are calculated based on a perception survey. However, these studies have concentrated on ranking Indian states, and they compute the change in rankings in two discrete time periods to arrive at conclusions on the investment attractiveness of different states. Whether the indices explain the variations in the economic performance across states is not tested. This paper constructs institutional indices based on secondary data and uses statistical methods to test the hypothesis that institutions affect economic performance. In doing so, it ignores the problems that are associated with obtaining information that is perception-based.[8] At the same time, it improves upon the previous study by testing the statistical significance of the hypothesis.

Fiscal governance plays an important role in fostering economic development. However, fiscal governance as measured by revenue and fiscal deficits is not a good indicator since it is not related to the level of development of the states. This is because poorer states which showed revenue surpluses and small fiscal deficits actually did so by sacrificing on development expenditures (Rao 2005).

Bhide, Chadha and Kalirajan (2005) refer to institutions in assessing growth spillovers across Indian states. However, the proxy for institutions that is used is the growth rate of state GDP itself. This is based on the assumption that richer states or those that have a higher growth are also the ones with better institutions. This may not necessarily be correct. In fact, the purpose of this paper is to test this very hypothesis.

At a broader regional level, no study has been conducted on the Indian subcontinent on country-specific institutions and economic performance. Some literature on fiscal aspects in Bangladesh argues that debt sustainability is an essential condition for macroeconomic stability and sustained economic growth. Often, high public debt can crowd out much-needed public spending and can generate adverse incentives that discourage private investors from engaging in activities that spur long-term growth (Islam and Biswas 2006). In this paper, an attempt is made to characterize fiscal governance based not on fiscal deficits but on the interest payments as a percentage of total expenditures. This would circumvent the problem alluded to by Rao (2005).

In conclusion, it may be stated that a 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 changed over time. The

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[8]   Aron (2000) discusses the problems of the perception-based indices at length.

method of using perceptional indices, however, has many problems associated with it and may not give an accurate picture. Second, the question of whether the perceptional 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, a different index is needed. This paper is an attempt to fill this gap and raise pertinent questions on the role of governance and the linkages between institutions and economic performance.

III.   THE DATA AND METHODOLOGY

Seventeen major Indian states have been considered on the basis of their population. Major states are defined as those whose population is greater than 6 million as of the 2001 census. Delhi has been removed from the analysis, even though it satisfies the population criterion, because it is an outlier and drives the results very significantly. Furthermore, this paper has not included newly created states (i.e. Chhattisgarh, Uttaranchal and Jharkhand) in the sample, even though they also satisfy the population criterion, because other data were not available for the period of study.[9] The selected Indian states account for more than 80 per cent of the entire Indian population and GDP. While formulating the institutional indicators, several variables were selected for each of them. To overcome the dimensionality problem, principal component analysis (PCA) was applied, resulting in four indicators. The details are given below.

The dependent variables:

(i)   *Per capita state gross domestic product.* This is an overall measure of economic development and is used routinely in many studies.

(ii)   *Index of industrialization.* This is a second index that was considered because the extent of industrialization has significant linkage effects that influence the level of development. It is measured as the ratio of the contribution of the secondary sector to total state GDP.

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[9]   For the data source and the list of Indian states, see annex II.

Independent variables and hypothesized relationship for the economic performance analysis

Institutional indicators

(i)   Index of creditors' property rights protection

Most of the cross-country studies have used indices prepared by international agencies, such as the International Country Risk Guide (ICRG) and Business Environment Risk Intelligence (BERI) indices. Other studies are based on variables constructed with the help of primary surveys. Further, Clague and others (1999) have used contract-intensive money (CIM) as a proxy for contract enforcement and property rights.[10] Property rights are a bundle of rights over property. This paper has considered one of the aspects of property rights for the reasons given below.

- *Credit-deposit ratio of commercial banks across states.* The credit-deposit (CD) ratio has traditionally been used as a credit efficiency indicator and is regarded as an aggregative measure for gauging the effectiveness of the credit delivery system. However, the ratio is significantly influenced by the overall credit environment and banks' lending policies (India 2005, 77). Scheduled commercial banks have always had lower CD ratios as compared to new private sector banks and foreign banks operating in India. Given the fact that new private banks and foreign banks operating in India do not lend to the rural sector, the difference in CD ratios among the banks can be considered as reflecting the degree of risk that the banks face in lending. A perusal of the data across the Indian states on scheduled commercial banks shows considerable variation. This has been taken as an indicator of the differences in the degree of risk that banks face across different states in India. Therefore, it is used as a proxy that represents the protection of creditors' property rights.

(ii)   Index of legal efficiency

This study has considered the average disposal of cases per court as a proxy to capture the efficiency level of the legal institution. A look at the data for this variable shows considerable spread over the states of India.

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[10]   Contract-intensive money (CIM) is the ratio of non-currency money to the total money supply, or (M2-C)/M2, where M2 is a broad definition of the money supply and C is currency held outside banks. A higher CIM ratio indicates more economic activity.

- *Average disposal of cases per court.* A higher disposal rate reduces pendency and facilitates quicker results. Undue delays in deciding cases and the resulting high costs involved in using the legal system are common complaints in most low- and middle-income countries.[11] Such an environment is not conducive to the smooth functioning of the market since it often creates an environment of high risk for business and makes the reliance of firms on the market less secure. Generally, court injunctions pending a court verdict prevent productive activities and increase the number of man-days lost, which creates massive economic losses. An efficient legal institution with a quicker disposal rate of cases can help to avoid this kind of economic loss and improve economic outcomes. Hence, a higher disposal rate is expected to be positively related to the dependent variables in the regression analysis.

(iii)   Index of rule of law

Usually, rule of law is a perceptional concept. For empirical purposes, many of the cross-country studies have used the rule of law indices prepared by international agencies (i.e. ICRG, BERI and the World Bank) on the basis of perceptions.[12] Due to the limitations of primary surveys, this study has made an attempt to capture rule of law on the basis of available proxies from secondary data sources.

- *Transmission and distribution (T & D) loss as a percentage of total generation.* T & D losses occur for two reasons: (a) loss due to technical reasons of transmission; and (b) loss due to theft i.e. illegal tapping of electric current from main transmission sources. Although the data on T & D losses do not distinguish between the two, losses due to technical reasons would be uniform across the states since the technology of generation and transmission of power does not vary significantly across the country. Hence, variations in T & D loss could be attributed to the second factor and are expected to be higher for poorer states, where the number of non-paying consumers is larger. The enforcement mechanism is

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[11]   North (1990) observes that societies that do not or cannot develop effective, low-cost enforcement are the cause of both historical and contemporary underdevelopment in the third world.

[12]   See the cross-country empirical studies on the rule of law by Barro (1996), Sala-i-Martin (1997) and Kaufmann, Kraay and Zoido-Lobatón (2002).

too poor to prevent illegal electricity consumption.[13] The probability of being caught is very low and people find that power theft is very easy and common. Hence, T & D loss can be used as a proxy for rule of law.

Extent and quality of State intervention

(i)   Index of economic freedom

This index reflects the extent to which the State participates in economic activities in each Indian state.

- *Ratio of total expenditure to state gross domestic product (SGDP).* We have used the standard practice of measuring State intervention as the "ratio of total expenditure to SGDP". The reason for the selection of this proxy is that it measures the degree of Government intervention in various economic activities. A higher ratio indicates more State intervention in the economy and there is a greater scope for corruption and other kinds of rent-seeking activities. Hence, *unnecessary* State interventions preclude productive activities and encroach upon the freedom of private individuals, subsequently creating stumbling blocks for economic prosperity.

(ii)   Index of fiscal governance

Traditionally, maintaining the fiscal stability of the economy is one of the important functions of the State. A gloomy fiscal scenario fails to attract and create incentives for the private economic agents to participate in productive economic activities. For the index of fiscal governance, two variables are used.[14]

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[13]   As per sample studies carried out by independent agencies, including The Energy and Resources Institute (TERI) in India, theft and pilferage account for a substantial part of the high transmission and distribution losses in India. The theft or pilferage of energy is mainly committed by two categories of consumers: non-consumers and bona fide consumers. Antisocial elements avail themselves of unauthorized or unrecorded power supply by hooking or tapping the bare conductors of line tap (LT) feeders or tampered service wires. Some of the bona fide consumers wilfully commit pilferage by damaging and/or creating disturbances to the measuring equipment installed at their premises.

[14]   Maintenance of the inflation rate, fiscal deficit, etc. at a lower level ensures fiscal stability. Since inflation rate data are available only at the country level, they are not applicable to the purpose of this study. We have ignored the data on fiscal deficit, because underdeveloped states of India maintain their fiscal deficit at a lower level by cutting short their development expenditures (Rao 2005). Hence, artificially maintained lower fiscal deficits across major Indian states would skew the results.

- • *Interest payments as a percentage of total expenditure.* This is one of the components of non-development expenditure. If a considerable portion of total expenditure is devoted to the interest payments on debts, then fewer resources are left to spend on other kinds of development-oriented activities. A higher percentage shows that a state has high debt intensity and that its future generations will suffer from a massive debt burden.

- • *Revenue expenditure as a percentage of total expenditure.* Revenue expenditure is the spending resulting from the process of collecting revenues. A higher ratio indicates that more resources are devoted to generating the revenues, which is redistributive in nature rather than productive: less is available for the productive and development-oriented uses. It is indicative of inefficient resource utilization and poor fiscal management.

(iii)   Index of the State as a provider of necessary goods and services

There are many types of necessary goods and services, such as the provision of physical infrastructure and the protection of the vulnerable segments of society through the provision of basic social and economic goods and services which the market does not supply. Nevertheless, the supply of these goods and services plays a significant role in economic outcomes. Hence, the role of the State in facilitating these necessary goods and services and improving economic outcomes is well documented in the literature. In order to capture this index, three variables have been selected based upon the following arguments.

- • *Ratio of surfaced (paved) roads to total roads.* This ratio represents the quality of road infrastructure; a higher ratio represents the maintenance of good transport facilities by the state and thus indicates that road transport is cheaper and quicker. In general, a developed infrastructure reduces the total transaction costs of an economy by saving time and minimizing transport costs, which attracts internal and external investment projects.

- • *Percentage of the population accessing telephone connections.*[15] An efficient telecommunications facility will reduce the costs of communication and will make transactions quicker and cheaper. Qualitative telecommunications services with Internet facilities will

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[15]   The time period of the study is when the Government was still the dominant provider of telephone communications. The cell phone revolution and the entry of private providers came at a later date.

facilitate distant and sophisticated transactions and trades. They improve the information systems of a society and reduce physical transport to a considerable extent.

- *Per capita development expenditure.* Basically, development-oriented expenditure includes the expenditures on social services, economic services, rural development and irrigation, etc., which are very important from an economic point of view. Higher per capita development expenditure by a state indicates the degree of importance of development-oriented activities in that state's agenda. The idea is that a committed state would spend more on such social goods and services.

(iv)   Index of political stability

Two variables are used in order to capture the political environment of major Indian states.

- *Number of times the President's rule was imposed.* The imposition of the President's rule indicates a poor political scenario in a state. Usually, the President's rule will be imposed when none of the political parties hold 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 to participate in economic activities and economic outcomes will always be suboptimal.

- *Number of times the Chief Ministers headed a coalition form of government.* The main problem with a coalition government is that it is not necessarily stable. The second problem is that unanimous decisions on important issues will take longer and be hard to come by. Different parties will be associated with different interest groups and will try to influence the government's decisions according to their concerned interests. Reversals of policies or frequent changes in policies can create an environment of uncertainty which can prevent desirable economic outcomes.

Common problems with cross-section analysis are multicollinearity[16] and dimensionality. Principal component analysis (PCA) is used as a statistical tool to remove these problems. PCA is applied to those proxies which are highly correlated amongst each other. Since the units of measurement of correlated variables are

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[16]   See annex I for table 1.1 of the correlation matrix (before applying PCA).

different, the correlation matrix is used in order to obtain the weights. Since a variable should not have an artificially higher weight due to its higher variance, the data are standardized with variance one (1) and mean zero (0) before applying PCA. Principal components having eigenvalues greater than one (1) are selected.[17] Finally, four principal components are retained which have extracted 85.57 per cent of variance of the dataset. The obtained weights are multiplied by the corresponding standardized values of the variables to arrive at the indices.[18] Since the proxy of the number of times the President's rule was imposed receives the highest weight in the first principal component, after multiplying it with the data on political stability and adding up, the resulting index is named the index of political stability. Similarly, the second principal component is the index of the State as a provider of necessary goods and services, and the third principal component, which has the highest weight to infrastructure, is the index of fiscal governance. The fourth principal component generates the index of economic freedom. After obtaining these four indices, the data are scaled in such a manner so as to generate a spread from –5 to +5. All indices are arranged on this scale to show that higher numbers represent better quality of institutions and governance. The purpose of using this homogeneous scale for all indices is to facilitate the ranking of the states in terms of the indices. The resulting four indices no longer have the problem of multicollinearity and can be used together in a regression equation. Since all the indices move in one direction, it is expected that economic performances are positively correlated. Hence, it is expected that the coefficient of all the indices would be positive.

IV. EMPIRICAL ANALYSIS AND THE RESULTS

Multiple ordinary least squares regression analysis is used to check the statistical significance levels of the indices and to explain the variations in the economic performances across major Indian states. Before regressing our objective indices over economic performance, we regressed the subjective institutional indices prepared by a previous study (Indicus Analytics 2004) over the same parameters of economic performance. Significantly, none of the subjectively calculated institutional indices explain the variations in the economic outcomes across the Indian states and, moreover, few of the indices appeared with wrong signs in the regression.[19]

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[17]   See table 1.2 in annex I for the results obtained after applying PCA.

[18]   See table 1.4 in annex I. In the table, the indices of the extent and quality of State intervention are obtained after using PCA, whereas the institutional indices are prepared from the raw data.

[19]   Since the subjectively calculated institutional indices do not explain the economic outcomes of the Indian states, we have not reported the regression results. However, details of all unreported results in the paper are available from the authors upon request.

The estimated regression results, after regressing our objective institutional indices over the economic performance indicators, are displayed in table 1.

Table 1. Regression results

Sample size: 17			
(t-ratio in parentheses)			
Dependent variables $\rightarrow$	*Per capita income*	*Index of industrialization*	
Independent variables ↓	*Model 1*	*Model 2*	*Model 3*
Index of legal efficiency	0.100	0.954	1.042*
	(0.635)	(1.635)	(1.957)
Index of creditors' property rights protection	0.043	0.489	–
	(0.849)	(0.741)	
Index of rule of law	-0.263	1.056**	1.025**
	(-0.742)	(2.334)	(2.489)
Index of political stability	0.278*	0.892**	0.933**
	(2.063)	(2.208)	(2.507)
Index of the State as a provider of necessary goods and services	1.110***	1.249**	1.471***
	(7.478)	(2.803)	(4.883)
Index of fiscal governance	0.465**	1.691***	1.906***
	(2.544)	(3.082)	(4.623)
Index of economic freedom	0.115	-0.175	–
	(0.442)	(-0.409)	
Intercept	10.676***	22.096***	22.097***
	(40.473)	(29.912)	(29.951)
R-squared	0.949	0.876	0.868
Adjusted R-squared	0.910	0.779	0.808
F-statistics	24.025***	9.073***	14.496***
Degrees of freedom	$F_{(7,17)}$	$F_{(7,17)}$	$F_{(5,17)}$

Notes: Probability level: *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

After regressing the indices over SGDP growth rate, obtained R^2, adjusted R^2 and F-statistics are too poor to adjudge the model as a good model. Except the intercept term, none of the independent variables emerged as significant in the equation. Probably, growth rate has a lot to do with macroeconomic variables such as investment and saving, rather than with the quality of State intervention and governance. Hence, regression results of SGDP growth rate are not reported in this paper.

The regression model with state per capita income has a very high explanatory power[20] and, since the adjusted R^2 is also very high, it is a good fit model (See model 1 in table 1). On the whole, one may argue that the indices explain almost 95 per cent of the variation in per capita income across the major Indian states. In this model, the index of rule of law appears with the wrong sign, but the level of significance is far from the acceptable level. The value of the coefficient of the index of the State as a provider of necessary goods and services is high. The major finding of this model is that the quality of State intervention and governance influences the per capita income level significantly, whereas the institutional indices do not. The governance indicator consists of the index of fiscal governance. Political stability is significant at the 10 per cent level, showing that there is a weak relationship between per capita income level and political stability. The picture is different when we look at the degree of industrialization across states.

After regressing our indices over the index of industrialization, two models (models 2 and 3 in table 1) which satisfy all the criteria of a good fit model are retained. All the indices have the expected signs except the index of economic freedom. However, the level of significance of economic freedom is very weak and is not significant. The levels of significance of the quality of State intervention and governance are much higher than the institutional indices. Surprisingly, the index of creditors' property rights protection appeared as an insignificant variable in the model, even though it is of the expected sign.[21] However, the rule of law index and the index of political stability are significant at the 5 per cent level. Hence it can be concluded that these two institutional variables exert a considerable influence on the level of industrialization of a state. The efficiency of the judiciary and its impact are significant, although at a 10 per cent level of significance, suggesting that legal efficiency does have an effect.

V. ROBUSTNESS OF THE RESULTS

The regression results do not ensure the direction of causality (i.e. problem of endogeneity). There could be the problem of reverse causality, which means that developed Indian states may be developed because they are spending more

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[20] This is, of course, partly due to the fact that the number of observations is rather small. The analysis could be extended if we obtained data for the whole region.

[21] The property rights index that was prepared for a report to the Twelfth Finance Commission (Indicus Analytics 2004) was also tried with the dependent variables. In neither of the cases did it turn out to be statistically significant.

on setting up the necessary institutions.[22] In order to confirm the direction of causality, we have regressed our indices over the previous period's development indicators.[23] The time period of our indices is from 1997-1998 to 2001-2002 and we regressed our indices on the development indicators of the time period from 1993-1994 to 1996-1997. Since the value of the regression coefficients based on the new data set are not larger than the original ones, it could be concluded that our results are robust and causality does not run from the developmental indicators to our indices. Moreover, our results do not suffer from heteroscedastic problems.[24]

VI. DISCUSSION OF THE RESULTS AND CONCLUSION

From the results it could be concluded that institutions do play a role in explaining the variations in economic performances across Indian states. Institutions play a significant role in explaining the variations in the extent of industrialization across Indian states but not in the case of variations in per capita GDP. Would this mean that institutional reforms are unimportant? This might seem to be a paradox since the Indian states that have a higher index of industrialization are also the ones with a higher per capita GDP. However, if fiscal governance and the State as a provider of necessary goods and services are removed from the analysis, then property rights emerge as a significant factor but the explanatory power decreases considerably. This suggests that, while institutional factors play a part in affecting economic performance, they are overshadowed by the role and quality of State intervention, especially fiscal governance. Another reason could be that the index of property rights developed may not reflect the real situation. To see if a perception-based index of property rights protection performs better, we used the index constructed by Indicus Analytics (2004) and conducted the same test. It turns out that the index, even when regressed alone with the data, does not turn out to be statistically significant. We conclude that the former explanation is a more valid reason for the results.

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[22] Helliwell (1994) finds that Gastil's civil liberties and political freedoms indices follow, rather than lead, changes in GDP.

[23] To deal with the problem of causality, Keefer and Knack (1997, 599-600) argue that "if causality operated only from growth to institutions, then regressions employing end-of-period values of the institutional indicators should produce larger coefficients than regressions relying upon older data."

[24] To check the problems related to heteroscedasticity, we calculated Huber/White sandwich robust standard errors and obtained roughly similar results. To make the paper less cumbersome, the regression results after undertaking causality tests and heteroscedasticity tests are not reported.

However, the institution of the rule of law does make a difference. On the question of whether the State acts in its own interests rather than in the interests of the people at large, we find that economic freedom is positively correlated with the level of development, but it is not statistically significant, suggesting that State intervention is not as predatory as it is sometimes made out to be. However, the State as a provider of necessary goods and services continues to play a very significant role in the economic performance of states in India. The other measure of the quality of governance, which has to do with fiscal governance, also plays an important role. States that spend on developmental expenditures have enjoyed a better level of economic development. The question of why the governments in some states have allocated a lower percentage of developmental expenditures cannot be answered by this analysis.

Lastly, political stability appears to have a dampening effect on economic performance. However, this is treated as an exogenous factor in this analysis and cannot be controlled by any policy.

From a policy perspective, it is clear that states must spend on developmental expenditures rather than on non-development expenditures. Investment in infrastructure by the state is still the single most important factor that would promote development. Institutional weakness would create problems in realizing the true potential of such efforts and must not be ignored. Better rule of law and faster disposal rates by courts would certainly have a positive effect. The judiciary in India has been appealing to the Government of India to allocate more money in the budget to the development of infrastructure related to legal institutions. At present, India spends a mere 0.2 per cent of the total budget on the judiciary. Other institutional reforms that strengthen property rights protection would depend upon which aspect of property rights plays a significant role in fostering economic development. This topic is left as an area for further research.

REFERENCES

Acemoglu, D., S. Johnson and J.A. Robinson (2001). "Reversal of fortune: geography and institutions in the making of the modern world income distribution", Working Paper 8460 (Cambridge, National Bureau of Economic Research).

Alesina, A., S. Özler, N. Roubini and P. Swagel (1996). "Political instability and economic growth", *Journal of Economic Growth,* vol. 1, No. 2, pp. 189-211.

Aron, J. (2000). "Growth and institutions: a review of the evidence", *The World Bank Research Observer,* vol. 15, No. 1, pp. 99-135.

Bardhan, P. (2004). *Scarcity, Conflicts and Cooperation: Essays in Political and Institutional Economics of Development* (Cambridge, MIT Press).

_____ (2005). "Institutions matter, but which ones?", *Economics of Transition,* vol. 13, No. 3, pp. 499-532.

Barro, R.J. (1991). "Economic growth in a cross section of countries", *Quarterly Journal of Economics,* vol. 106, No. 2, pp. 407-444.

_____ (1996). "Determinants of economic growth: a cross-country empirical study", Working Paper 5698 (Cambridge, National Bureau of Economic Research).

Bhide, S., R. Chadha and K. Kalirajan (2005). "Growth interdependence among Indian states: an exploration", *Asia-Pacific Development Journal,* vol. 12, No. 2, pp. 59-80.

Brunetti, A. and B. Weder (1998). "Investment and institutional uncertainty: a comparative study of different uncertainty measures", *Weltwirtschaftliches Archiv,* vol. 134, No. 3, pp. 513-533.

Buchanan, J.M. and G. Tullock (1962). *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (Ann Arbor, University of Michigan Press).

Buchanan, J.M. and R.A. Musgrave (1999). *Public finance and public choice: Two contrasting visions of the State* (Cambridge, MIT Press).

Clague, C., P. Keefer, S. Knack and M. Olson (1999). "Contract-intensive money: contract enforcement, property rights, and economic performance", *Journal of Economic Growth,* vol. 4, No. 2, pp. 185-211.

Debroy, B. and L. Bhandari (2004). "India's best and worst states", *India Today,* August 16.

Downs, A. (1957). *An Economic Theory of Democracy* (Cambridge, Cambridge University Press).

Frye, T. and A. Shleifer (1997). "The invisible hand and the grabbing hand", *The American Economic Review,* vol. 87, No. 2, pp. 354-358.

Hall, R.E. and C.I. Jones (1999). "Why do some countries produce so much more output per worker than others?", *Quarterly Journal of Economics,* vol. 114, No. 1, pp. 83-116.

Helliwell, J.F. (1994). "Empirical linkages between democracy and economic growth", *British Journal of Political Science,* vol. 24, No. 2, pp. 225-48.

India (2005). *Report on Trend and Progress of Banking in India 2004-05* (Mumbai, Reserve Bank of India).

Indicus Analytics (2004). "Measuring Inter-State Differences in Investment Climate", report of a project conducted for the Twelfth Finance Commission (New Delhi).

Islam, M.E. and B.P. Biswas (2006). "Public debt management and debt sustainability in Bangladesh", Working Paper WP0705, PAU, (Dhaka, Bangladesh Bank).

Kaufmann, D., A. Kraay and P. Zoido-Lobatón (2002). "Governance matters", mimeographed document, (Washington, D.C., World Bank).

Knack, S. and P. Keefer (1995). "Institutions and economic performance: cross-country tests using alternative institutional measures", *Economics and Politics,* vol. 7, No. 3, pp. 207-227.

Keefer, P. and S. Knack (1997). "Why don't poor countries catch up? A cross-national test of an institutional explanation", *Economic Inquiry,* vol. 35, No. 3, pp. 590-602.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny (1999). "The quality of government", *The Journal of Law, Economics, and Organization,* vol. 15, No. 1, pp. 222-279.

Levine, R. (1998). "The legal environment, banks, and long-run economic growth", *Journal of Money, Credit and Banking,* vol. 30, No. 3, pp. 596-613.

Mauro, P. (1995). "Corruption and growth", *Quarterly Journal of Economics,* vol. 110, No. 3, pp. 681-712.

Musgrave, R.A. (1959). *The Theory of Public Finance: A Study in Public Economy* (New York, McGraw-Hill Book Co.).

North, D.C. (1989). "Institutions and economic growth: an historical introduction", *World Development,* vol. 17, No. 9, pp. 1319-1332.

_____ (1990). *Institutions, Institutional Change and Economic Performance* (Cambridge, Cambridge University Press).

Olson, M. (1965). *The Logic of Collective Action* (Cambridge, Harvard University Press).

Rao, M.G. (2005). "Fiscal Federalism in India: Emerging Challenges", Silver Jubilee Lecture, unpublished manuscript, Centre for Economic and Social Studies (CESS), Hyderabad, India.

Rodrik, D., A. Subramanian and F. Trebbi (2004). "Institutions rule: the primacy of institutions over geography and integration in economic development", *Journal of Economic Growth,* vol. 9, No. 2, pp. 131-165.

Rodrik, D. and A. Subramanian (2005). "From 'Hindu growth' to productivity surge: the mystery of the Indian growth transition", *IMF Staff Papers,* vol. 52, No. 2, pp. 193-228.

Sala-i-Martin, X. (1997). "I just ran two million regressions", *American Economic Association Papers and Proceedings,* vol. 87, No. 2, pp. 178–183.

Schaefer, H. and A.V. Raja (2006). *Law and Economic Development* (Northampton, Edward Elgar Publishing, Inc.).

Scully, G.W. and D.J. Slottje (1991). "Ranking economic liberty across countries", *Public Choice,* vol. 69, No. 2, pp. 121-152.

Stiglitz, J.E. (1989a). "Markets, market failures, and development", *The American Economic Review,* vol. 79, No. 2, pp. 197-203.

_____ (1989b). "On the economic role of the State", in A. Heertje, ed., *The Economic Role of the State* (Oxford, Basil Blackwell).

_____ (1998). "Distinguished lecture on economics in government: the private uses of public interests: incentives and institutions", *Journal of Economic Perspectives,* vol. 12, No. 2, pp. 3-22.

Subramanian, A. (2007). "The evolution of institutions in India and its relationship with economic growth", *Oxford Review of Economic Policy,* vol. 23, No. 2, pp. 196-220.

Svensson, J. (1998). "Investment, property rights, and political instability: theory and evidence", *European Economic Review,* vol. 42, No. 7, pp. 1317-1341.

Tabellini, G. (2005). "The role of the State in economic development", *Kyklos,* vol. 58, No. 2, pp. 283-303.

ANNEX I

Table 1.1. Correlation matrix (before using the principal component analysis (PCA))

	CM_COALI	PRS_RULE	INTEREST	REV_EXPE	SRF_ROAD	TELE_HH	PER_DEVE	TOT_EXPE	CD_RATIO	AVG_DISP	TD_LOSSE
CM_COALI	1.000										
	–										
PRS_RULE	0.678	1.000									
	(0.003)	–									
INTEREST	-0.263	-0.390	1.000								
	(0.308)	(0.122)	–								
REV_EXPE	-0.277	-0.213	0.540	1.000							
	(0.282)	(0.411)	(0.025)	–							
SRF_ROAD	0.228	0.151	-0.197	0.539	1.000						
	(0.378)	(0.563)	(0.449)	(0.026)	–						
TELE_HH	-0.477	-0.393	0.236	-0.058	-0.545	1.000					
	(0.053)	(0.118)	(0.362)	(0.824)	(0.024)	–					
PER_DEVE	-0.006	0.048	-0.564	0.002	0.520	-0.254	1.000				
	(0.982)	(0.853)	(0.018)	(0.993)	(0.033)	(0.326)	–				
TOT_EXPE	-0.336	-0.199	0.575	0.419	-0.314	0.558	-0.531	1.000			
	(0.187)	(0.444)	(0.016)	(0.094)	(0.220)	(0.020)	(0.028)	–			
CD_RATIO	0.407	0.182	-0.114	-0.385	-0.140	-0.392	-0.017	-0.461	1.000		
	(0.105)	(0.484)	(0.664)	(0.127)	(0.591)	(0.120)	(0.948)	(0.063)	–		
AVG_DISP	-0.051	-0.115	0.191	-0.077	-0.041	-0.318	-0.018	-0.029	-0.111	1.000	
	(0.847)	(0.661)	(0.462)	(0.769)	(0.874)	(0.213)	(0.945)	(0.912)	(0.671)	–	

Table 1.1. (continued)

	CM_COALI	PRS_RULE	INTEREST	REV_EXPE	SRF_ROAD	TELE_HH	PER_DEVE	TOT_EXPE	CD_RATIO	AVG_DISP	TD_LOSSE
TD_LOSSE	-0.239	0.020	0.499	0.215	-0.468	0.417	-0.394	0.477	0.003	-0.105	1.000
	(0.356)	(0.938)	(0.041)	(0.406)	(0.058)	(0.096)	(0.117)	(0.053)	(0.990)	(0.688)	–

Note: Figures in parentheses represent probability levels.

Abbreviations: CM_COALI, number of times the Chief Ministers headed a coalition form of government; PRS_RULE, number of times the President's rule was imposed; INTEREST, interest payments as a percentage of total expenditure; REV_EXPE, revenue expenditure as a percentage of total expenditure; SRF_ROAD, ratio of surfaced roads to total roads; TELE_HH, percentage of population accessing telephone connection; PER_DEVE, per capita development expenditure; TOT_EXPE, ratio of total expenditure to state gross domestic product (SGDP); CD_RATIO, credit-deposit ratio of commercial banks across states; AVG_DISP, average disposal of cases per court; TD_LOSSE, transmission and distribution (T & D) loss as a percentage of total generation.

Table 1.2. Weights assigned after applying PCA

Variables ↓ Principal components →	First component	Second component	Third component	Fourth component
Number of times the President's rule was imposed	0.50937	0.12012	0.28461	0.07193
Number of times the Chief Ministers headed a coalition form of government	0.42678	0.06668	0.26620	0.24015
Interest payments as a percentage of total expenditure	0.42724	0.06664	-0.12100	0.52643
Revenue expenditure as a percentage of total expenditure	0.18683	0.14909	0.52994	-0.31792
Ratio of surfaced roads to total roads	-0.17461	0.09645	-0.25614	0.08276
Percentage of population accessing telephone connection	-0.16315	0.59681	0.35154	0.16970
Per capita development expenditure	-0.42713	0.60008	0.40365	0.31942
Ratio of total expenditure to SGDP	-0.21577	-0.47791	0.44782	0.61446
Statistics				
Eigenvalues	2.62496	1.80910	1.43723	1.07424
Percentage of variance extracted	32.81	22.61	17.97	12.18

Abbreviation: SGDP, state gross domestic product.

Table 1.3. Correlation matrix (after using PCA)

	LEG_EFFI	PR_RIGHT	RULE_LAW	POL_STAB	STA_INFR	FIS_GOVE	FREEDOM
LEG_EFFI	1.000 –						
PR_RIGHT	0.174 (0.504)	1.000 –					
RULE_LAW	-0.215 (0.407)	-0.167 (0.522)	1.000 –				
POL_STAB	0.394 (0.117)	0.314 (0.219)	-0.337 (0.186)	1.000 –			
STA_INFR	0.310 (0.226)	0.481 (0.051)	0.343 (0.178)	0.214 (0.409)	1.000 –		
FIS_GOVE	-0.382 (0.130)	0.336 (0.187)	-0.349 (0.169)	0.020 (0.940)	-0.361 (0.155)	1.000 –	
FREEDOM	-0.135 (0.605)	0.431 (0.084)	-0.238 (0.358)	-0.019 (0.942)	-0.096 (0.715)	0.359 (0.157)	1.000 –

Note: Figures in parentheses represent probability levels.

Abbreviations: LEG_EFFI, index of legal efficiency; PR_RIGHT, index of creditors' property rights protection; RULE_LAW, index of rule of law; POL_STAB, index of political stability; STA_INFR, index of the State as a provider of necessary goods and services; FIS_GOVE, index of fiscal governance; FREEDOM, index of economic freedom.

Table 1.4. Indices by state

States ↓ / Indices →	LEG_EFFI	PR_RIGHT	RULE_LAW	POL_STAB	STA_INFR	FIS_GOVE	FREEDOM
1. Uttar Pradesh	-0.41	-1.81	1.91	-5.00	-1.97	1.22	-3.33
2. Maharashtra	-0.59	3.98	-2.21	1.18	1.93	1.86	0.45
3. Bihar	-2.25	-2.68	2.49	-2.39	-5.00	-1.03	1.10
4. West Bengal	-2.51	-0.59	0.76	-1.15	-1.61	3.07	-0.52
5. Andhra Pradesh	0.99	1.56	-2.42	1.32	-1.00	2.73	1.24
6. Tamil Nadu	0.17	5.00	-1.44	2.15	0.60	2.11	2.42
7. Madhya Pradesh	-1.13	0.16	0.51	1.23	-2.58	1.98	2.06
8. Rajasthan	-1.39	-0.47	-0.25	-0.43	-1.35	2.90	-0.28
9. Karnataka	-0.67	1.15	-1.46	1.05	1.76	-0.19	3.07
10. Gujarat	5.00	1.89	1.38	1.24	3.73	-1.00	1.31
11. Orissa	0.21	-1.74	-2.73	-2.73	-3.09	-0.50	-0.24
12. Kerala	1.34	0.75	2.38	-2.83	4.25	-5.00	-0.80
13. Assam	-0.45	-2.07	0.04	-0.91	-3.38	-1.29	2.53
14. Punjab	-1.92	-0.18	3.00	-1.44	4.86	-1.60	-1.55
15. Haryana	0.20	-1.12	-1.21	0.81	2.61	-0.07	1.42
16. Jammu and Kashmir	2.67	-2.59	-5.00	3.88	-3.09	-2.01	-4.03
17. Himachal Pradesh	0.76	-1.22	4.26	3.92	3.37	-3.14	-5.00

Abbreviations: LEG_EFFI, index of legal efficiency; PR_RIGHT, index of creditors' property rights protection; RULE_LAW, index of rule of law; POL_STAB, index of political stability; STA_INFR, index of the State as a provider of necessary goods and services; FIS_GOVE, index of fiscal governance; FREEDOM, index of economic freedom.

ANNEX II

VARIABLES, DATA SOURCES AND TIME PERIOD

Table 2.1. Variable list for the index of economic freedom

Variables	*Data sources*	*Years*
1. Total government expenditure as a percentage of SGDP	India, *State Finances: A Study of State Budgets* (Mumbai, Reserve Bank of India, 2003)	1998-2002

Abbreviation: SGDP, state gross domestic product.

Table 2.2. Variable list for the index of political stability

Variables	*Data sources*	*Years*
1. Number of times the President's rule was imposed	D.D. Basu, *Introduction to the Constitution of India,* 19th edition reprint (New Delhi: Wadhwa and Company, 2004)	1998-2002
2. Number of times a coalition government was formed	India, *Statistical Reports on General Elections to the State Legislative Assemblies* (New Delhi: Election Commission of India (ECI), 1998-2002)	1998-2002

Table 2.3. Variable list for the index of fiscal governance

Variables	*Data sources*	*Years*
1. Interest payments as a percentage of total expenditure	India, *State Finances: A Study of State Budgets* (Mumbai, Reserve Bank of India, 2003)	1998-2002
2. Revenue expenditure as a percentage of total expenditure	India, *State Finances: A Study of State Budgets* (Mumbai, Reserve Bank of India, 2003)	1998-2002

Table 2.4. Variable list for the index of the State as a provider of necessary goods and services

Variables	Data sources	Years
1. Surfaced roads as a proportion of total roads	India, *Statistical Abstract India 2003,* Ministry of Statistics and Programme Implementation (New Delhi, Controlled Publications, 2004)	1998-2002
2. Percentage of households that have access to a telephone	India, *Census of India 2001,* Office of the Registrar General (New Delhi, Ministry of Home Affairs)	2001
3. Per capita development expenditure	India, *State Finances: A Study of State Budgets* (Mumbai, Reserve Bank of India, 2003)	1998-2002

Table 2.5. Variable list for creditors' property rights protection

Variables	Data sources	Years
1. Credit-deposit ratio of scheduled commercial banks per 1 000 population (in tens of millions of rupees)	India, *Report on Trend and Progress of Banking in India* (Mumbai: Reserve Bank of India, 2002).	1998-2002

Table 2.6. Variable list for the index of legal efficiency

Variables	Data sources	Years
1. Average disposal rate of cases per court	India, *Annual Report 2001-02* (New Delhi, Ministry of Law, Justice and Company Affairs)	1998-2001

Table 2.7. Variable list for the rule of law

Variables	Data sources	Years
1. Percentage of transmission and distribution (T & D) losses	India, *Annual Report (2001-02) on the Working of State Electricity Boards & Electricity Departments,* Power and Energy Division (New Delhi, Planning Commission, May 2002)	1998-2001

Table 2.8. Variable list for development and growth indicators

Variables	Data sources	Years
1. Per capita income	India, *State Finances: A Study of State Budgets* (Mumbai, Reserve Bank of India, 2003)	1998-2002
2. SGDP growth rates	India, *State Finances: A Study of State Budgets* (Mumbai, Reserve Bank of India, 2003)	1998-2002
3. Index of industrialization	India, *State Finances: A Study of State Budgets* (Mumbai, Reserve Bank of India, 2003)	1998-2002

Abbreviation: SGDP, state gross domestic product.

Table 2.9. Serial number of states (as per size of population)

1. Uttar Pradesh	7. Madhya Pradesh	13. Assam
2. Maharashtra	8. Rajasthan	14. Punjab
3. Bihar	9. Karnataka	15. Haryana
4. West Bengal	10. Gujarat	16. Jammu and Kashmir
5. Andhra Pradesh	11. Orissa	17. Himachal Pradesh
6. Tamil Nadu	12. Kerala	