



## **Do Effective State Business Relations Matter for Economic Growth? Evidence from Indian States\***

Massimiliano Calì<sup>1</sup> and Kunal Sen<sup>2+</sup>

**Discussion Paper Series  
Number twenty-nine  
November 2009**

**IPPG Discussion Papers  
available at  
[www.ippg.org.uk](http://www.ippg.org.uk)**

IPPG Programme Office, IDPM, School of Environment & Development  
University of Manchester, Arthur Lewis Building, 2.023, Oxford Road  
Manchester M13 9PL; Telephone 0161 306 6438; [ippg@manchester.ac.uk](mailto:ippg@manchester.ac.uk)  
[www.ippg.org.uk](http://www.ippg.org.uk)

\*We thank Nicola Cantore, Siddhartha Mitra and seminar participants at the University of London, Copenhagen Business School and the IPPG Jaipur workshop for helpful comments. Financial support from the Improving Institutions for Pro-Poor Growth (IPPG) Consortium is gratefully acknowledged. All opinions and remaining errors are solely ours.

<sup>1</sup>Overseas Development Institute, London, UK, [m.cali@odi.org.uk](mailto:m.cali@odi.org.uk)

<sup>2</sup>IDPM, University of Manchester, UK, [Kunal.Sen@manchester.ac.uk](mailto:Kunal.Sen@manchester.ac.uk); phone: +44 161 2750967

†Corresponding author



Paper prepared for the DFID-funded Research Programme, Institutions and Pro-Poor Growth (IPPG). The authors are grateful to DFID for the funding that made this research possible. The views expressed in this paper are entirely those of the author and in no way represent either the official policy of DFID or the policy of any other part of the UK Government.

Material published by the IPPG may be reproduced free of charge in any format or medium provided it is reproduced faithfully, not used in a misleading context and properly attributed to the author(s). Copyright exists in all other original material published by members of the Programme and may belong to the author or to the University of Manchester depending on the circumstances of publication. Enquiries should be sent to the editor at the above address.

## CONTENTS

	PAGE
Abstract	3
1 Introduction	5
2 Why do effective state business relations matter for economic growth?	7
3 Measuring effective state business relations in India	9
3.1 <i>The role of the private sector in SBR (SBR Private)</i>	9
3.2 <i>The role of the public sector in SBR (SBR Public)</i>	10
3.3 <i>The interaction between states and businesses (SBR Practice)</i>	11
3.4 <i>Mechanisms to avoid collusive behaviour (SBR Collusive)</i>	11
4 Empirical strategy, data and descriptive statistics	14
4.1 <i>Empirical Specification</i>	14
4.2 <i>Econometric Methodology</i>	15
4.3 <i>Data</i>	18
5 Results	20
6 Conclusions	27
References	31

## ABSTRACT

Effective state-business relations are a set of highly institutionalised, responsive and public interactions between the state and the business sector. This paper examines the impact of effective state-business relations on economic growth across Indian states over the period 1985-2006. We propose a measure that captures the various dimensions of effective state-business relations (SBR) at the sub-national level, and estimate standard growth regressions using dynamic panel data methods with this measure, controlling for other determinants of sub-national level growth. Our results show that effective state-business relations contribute significantly to economic growth. This result is robust to the use of different specifications and methods for computing the SBR measure and appears to be driven by the intensity of the interactions between the state and the private sector as well as by the absence of harmful collusive behaviour between them.

**JEL Classification:** O10, O43, O53, R11.

**Key-words:** State-business relations, institutions, economic growth, Asia, India.

## 1 INTRODUCTION

There is close to an intellectual consensus that political institutions of relatively limited government which provide for secure property rights for producers in the economy are fundamental determinants of differences in living standards across countries (Hall and Jones 1999, Acemoglu, Johnson and Robinson 2001, and Subramanian, Rodrik and Trebbi 2004). According to this literature, economic growth occurs in contexts where the state respects the property rights of private producers and where it does not expropriate property or allows others to do so. This view is principally informed by the neoclassical perspective on the state where its role should be confined to providing law and order and macroeconomic stability and not to intervene in the activities of private producers. However, as has been witnessed in East Asia, economic growth has occurred in contexts where there were strong collaborative relations between the political and economic elites. In contrast to the state's predatory role highlighted in the recent empirical literature on institutions and growth, there has been little recognition in this literature of the state's developmental role and that 'good growth-enhancing relations between business and government elites are possible' (Maxfield and Schneider 1997).<sup>1</sup>

In this paper, we take this suggestion seriously and attempt to examine empirically the growth implications of effective state-business relationships (SBRs), i.e. 'the maintenance of benign collaboration between the agents of the state and business' (Harriss 2006). By this we mean a set of highly institutionalised, responsive and public interactions between the state and the business elite. Taking into account the increasing criticism of cross-country growth regressions as a methodology to understand the determinants of economic growth, our focus is within country variations in economic growth.<sup>2</sup> In particular we exploit the institutional differences of Indian states testing for the impact of effective SBRs on economic growth for fifteen major Indian states over the period 1985-2006. We first propose a way of quantifying the degree of effectiveness of SBRs for sixteen Indian states for the period 1985-2006, which has been developed by Calì, Mitra and Purohit

---

<sup>1</sup> An exception is Sen and Te Velde (2009) who measure the effectiveness of state-business relations for 19 African countries over 1970-2006 and show this measure can explain economic growth, independent of other measures of institutional quality.

<sup>2</sup> There is concern that that cross-country cross-sectional regression methods do not adequately control for the possibility of reverse causality, where economic development itself may lead to the development of good quality institutions, given the problems of identifying robust instruments for institutional quality that are not correlated with economic development (Albouy 2008). Also, these empirical studies are often not able to incorporate innate differences in cultural attributes and initial conditions that are unobservable to the researcher but that may be important determinants of economic growth (Kenny and Williams 2001). Furthermore, in studies which use these methods, it is difficult to disentangle geography as an independent determinant of economic growth from institutions since countries with poor institutions are also countries that suffer from weak geographical factors (Sachs 2003). These criticisms of cross-country regression methods would be less applicable to within country econometric analysis as culture and geographical factors (such as climate) are less likely to vary within countries than between countries, and it may be possible to identify meaningful and robust instruments for institutions at the country-level than across countries.

(henceforth, CMP, 2009).<sup>3</sup> We then use this measure in dynamic panel data regressions and show that this measure can explain a significant part of the variations in per capita income across Indian states and over time. Importantly, we try to address the possibility of endogeneity related to the SBRs variable as well as to the inclusion of the lagged dependent variable typical of growth regressions. We also show that the effect of SBRs on economic growth is robust to alternate specifications and is independent of other determinants of economic growth.

India provides a rich empirical context to study the impact of effective state-business relations on economic growth for three reasons. Firstly, while economic growth in India has been strong since the mid 1980s, not all regions in India have benefited equally from the improvement in overall economic performance.<sup>4</sup> States like Andhra Pradesh, Gujarat, Karnataka, Kerala and Tamil Nadu have grown at a rate of per capita income which has exceeded 4.5 per cent per annum during the period. On the other hand, states such as Assam, Bihar and Madhya Pradesh have grown at around 2 per cent or less in the same period.<sup>5</sup> In contrast to the experience of China where geographical factors such as land-lockedness and access to the sea explain to a large extent the patterns of regional economic performance (Demurger 2002, Kanbur and Zhang 2005, Heilig 2006), there is no clear correlation between geography and regional growth in India. Land-locked states such as Punjab and Haryana have exhibited strong economic growth and coastal states such as Orissa have shown significantly weaker economic performance. The literature on the growing regional divergence in India has failed to convincingly identify which factor or set of factors may explain the differences in rates of economic growth across Indian states, and we will explore in this paper whether variations in regional institutional quality captured by effective SBRs can explain observed variations in economic growth in Indian states.<sup>6</sup>

---

<sup>3</sup> We have data for the SBR index for sixteen major states, but can only use fifteen of them in the analysis, as we do not have enough data for Uttarkhand.

<sup>4</sup> The growth of per capita income in India accelerated from 1.7 per cent per annum in 1960-1985 to 4.3 per cent per annum in 1985-2006.

<sup>5</sup> The divergence in growth rates across Indian states is surprising, given that other studies of growth across regions have found evidence of strong convergence, whether these are states within the United States, regions within Europe, or prefectures within Japan (Barro and Sala-i-Martin 1991 and 1992b, and Sala-i-Martin 1996). Furthermore, the political economy of Indian fiscal federalism also favours convergence, with relatively more grants from the central government transferred to the poorer Indian states rather than their richer counterparts (Cashin and Sahay 1996). The lack of convergence in economic growth across Indian states provides a prime facie case that 'deep determinants' of economic growth such as variations in institutional quality across states may explain variations in sub-national growth rates.

<sup>6</sup> Four recent papers that have studied the determinants of state-level growth in India are Sachs, Bajpai and Ramiah (2002), Kochhar, Kumar, Rajan, Subramanian and Tokatlidis (2006), Purfield (2006) and Nayyar (2008). Out of these four papers, only Kochhar et al. explicitly incorporate state-level institutions as a determinant of state-level growth. Sachs et al. find that the rate of urbanisation determine state-level growth, while Purfield and Nayyar find that the key determinant of the latter is credit offered by banks and other financial institutions (as a proxy for private investment). Given that both urbanisation and credit are strongly endogenous to growth, it is difficult to establish a causal role for either of these two variables. Kochhar et al. use transmission and distribution (T & D) losses of state electricity boards as a proxy for institutional quality (better governed states should have lower T & D losses due to lower corruption and lower willingness by the state government to accept

Secondly, India's federal structure and the significant political autonomy and independence in legislative powers enjoyed by state governments, along with regional variations in the collective strength of the economic and political elite allows for the variation in regional institutional quality that may allow us to identify its effects on economic growth. Thus, the Indian economy provides an appropriate empirical context to study the effects of institutions on growth using Indian states as units of analysis. Finally, by using Indian states as units of analysis and by using a time-varying measure of institutional quality so that we can use panel data econometric methods in our empirical analysis, we are able to address some of the problems that have occurred in the cross-country literature on economic growth. By examining within-country variations in growth, we are less subject than cross-country analyses to the criticism of not adequately addressing the innate cultural attributes and historical factors that may influence growth in a time-varying country-specific way. We are also able to control for the effects of meta-institutions that operate at the national level such as the rule of law, the presence of democratic institutions and the origin of the legal system. Furthermore, drawing from India's political history, we are able to use appropriate instruments for our measure of institutional quality – effective state-business relations – to address the problem of reverse causality, which has been a recurrent problem in the cross-country literature on institutions and growth (Sen et al. 2006).

The remainder of the paper is organised as follows. In Section 2, we discuss the theoretical basis of why effective state-business relations may matter for economic growth. In Section 3, we describe the CMP measure of effective state-business relations and provide estimates of it for a set of fifteen Indian states for the period 1985-2006. In Section 4, we present the empirical specification, discuss the econometric methodology, and describe the data. Section 5 presents the results and Section 6 concludes.

## 2 WHY DO EFFECTIVE STATE BUSINESS RELATIONS MATTER FOR ECONOMIC GROWTH?

Effective SBRs can have a positive impact on economic growth by increasing both the rate of investment and the productivity of investment. With respect to the rate of investment, irreversibility and the possibility of delay are important considerations in the investment decision (Pindyck 1991, Dixit and Pindyck 1994). Plant and equipment investment can be

---

theft of electricity by households and firms) and find that T & D losses of state electricity boards are negatively correlated with state-level economic growth. However, inadequate infrastructure as reflected in poorly performing state electricity boards is an outcome of weak institutional quality rather than been a direct measure of the latter, and there are other equally important dimensions of institutional quality that are not captured in the measure proposed by Kochhar et al.

considered 'sunk costs' if capital, once installed, is firm- or industry-specific and cannot be put to productive use in a different activity or if secondary markets are not efficient. The decision to undertake an irreversible investment in an uncertain environment can be viewed as involving the exercising of an option - the option to wait for new information that might affect the desirability and timing of the investment. This opportunity cost can be substantial in most circumstances and a higher degree of uncertainty about the future can have a significant negative effect on investment. Effective SBRs that lead to credible commitment on the part of the government to certain policies can minimise uncertainties on future policy actions in the minds of investors, and by doing so, raise the rate of investment (Rodrik 1991, Ibarra 1995).

A second way that effective SBRs can lead to a higher rate of investment is by creating an institutional environment where the state provides high quality public goods that matter to the private sector such as infrastructure, effective public administration (or the lack of corruption) and secure property rights. Public investment in infrastructure is highly complementary to private investment in developing countries, and has strong 'crowding in' effects (Blejer and Khan 1984). A well organised private sector can make clear to the state where the priorities are for public investment and can monitor the quality of such investment. Such high quality investments are more likely to be forthcoming with a well organised and responsive state. Effective public administration and lack of expropriation of property rights of the private sector is more likely to occur with professionally run and well organised government agencies and through the direct and indirect pressures that business associations can place on government officials.

Effective SBRs can also influence the productivity of investments. Peak and sectoral business associations that are active, independent of the state and representative of the private sector in the region, can resolve many of the collective action problems that are inherent in developing countries, where most firms are of small and medium size and are unable to articulate their views and concerns to agencies of the state. Such business associations can provide accurate information on current and future investment opportunities and potential problems to its members, invest in training of the workers of member firms, help in enforcing industry quality standards and voice the demands of its members to industry ministries and state investment agencies (Cammatt 2007). By doing so, such associations can minimise transactions and coordination costs and ensure that investments that are made by its members have the highest returns.<sup>7</sup> Synergistic state-

---

<sup>7</sup> Doner and Schneider (2000) argue that business associations can contribute to economic performance by providing both market-supporting and market-complementing activities. Through market-supporting activities, business associations can strengthen the overall functioning of markets by supporting the provision of public goods such as electricity and roads which are critical for productive investments to take place. Market-

business relations also minimise the possibility of rent-seeking and collusive behaviour which may lead to directly unproductive economic activities (Krueger 1974, Bhagwati, Brecher and Srinivasan 1984). Thus, effective SBRs can be expected to increase the efficiency of investment and of overall productivity growth in the economy.

### 3 MEASURING EFFECTIVE STATE BUSINESS RELATIONS IN INDIA

A major problem associated with testing the impact of effective SBRs on the economy concerns the way to properly measure them. Te Velde (2006) was the pioneering study to develop measures of the effectiveness of SBRs with an application for sub-Saharan African countries. He argues that an SBR index should have four components, which reflect the main aspects of effective SBRs:

- 1) the way in which the private sector is organised vis-à-vis the public sector;
- 2) the way in which the public sector is organised vis-à-vis the private sector;
- 3) the practice and institutionalisation of SBRs;
- 4) the avoidance of harmful collusive behaviour between the two sectors.

CMP construct a composite SBR measure based on the above four dimensions for sixteen Indian states using both primary and secondary data.<sup>8</sup> We describe below the manner CMP operationalise the measurement of SBR in India.

#### 3.1. The role of the private sector in SBR (SBR Private)

The most relevant way in which the private sector can organise itself vis-à-vis the public sector is via an umbrella organisation. One of the major roles of such an organisation is arguably lobbying the State to produce legislations and regulations that may favour the businesses. As argued by Kohli (2006) and confirmed by the fieldwork in CMP this is clearly the case in India as well. CMP capture the role of the private sector by measuring the quality and effectiveness of the umbrella business association (representing all

---

complementing activities, on the other hand, address various types of market imperfections and involve 'direct coordination among firms to reconcile production and investment decisions' (Doner and Schneider 2000, p. 264).

<sup>8</sup> One important characteristic of this measure that is relevant for the empirical analysis in the paper is that it varies **both** over time and space, as the measure has been computed for the 15 major Indian states for the period 1985-2006. Thus, the variations in the measure both in the time-series and cross-sectional dimensions allow us to estimate the effects of effective SBRs on economic growth more precisely than may have been possible using cross-sectional measures of regional institutional quality such as the World Bank's Doing Business indicators which are only available for a few years (World Bank 2009). The time-series variation is particularly relevant in the case of India, where subnational institutions have evolved in very different ways following the economic reforms of the mid 1980s and early 1990s (Saez 2002).

sectors) and two other business associations representing the major sectors in each state. For each of these associations they use the following variables for such measurement:

- a) Whether the private sector is organised through an **umbrella organisation** or not (a score of 1 is given in each year the association existed, 0 otherwise).
- b) Whether the private sector association has a **website** or not: The variable takes a value of zero in any year in which the organisation does not have a website and 1 otherwise. This is likely to proxy for the quality of the organisational structure as well as its outside visibility. Evidence from their fieldwork confirms that organisations appearing to be more structured and organised have had an active website in place for a longer time.
- c) How frequently **the website is updated**: Again, this captures the efficiency of internal processes (which makes frequent updates possible) as well as the level of activity of the organisation. The need for updating the website more frequently should increase with the intensity of the organisation's activity.<sup>9</sup>
- d) Whether the association owns its **office premises** (value of 1) or not (value 0). This variable proxies the level of the organisation's resources as well as the extent to which the association is willing to invest in costly physical assets, with owned premises suggesting a more established business association.<sup>10</sup>

### 3.2. The role of the public sector in SBR (SBR Public)

CMP measure the role of the public sector in SBR by two measures:

- a) the presence of state owned or state participated **productive corporations**, which are investment promotion agencies active in most states, i.e. Financial, Infrastructure Development and Tourism Development Corporations. These represent important types of pro-business engagements with benefits for all sectors (with the exception of the tourism corporation, which is the only sectoral corporation with a presence in virtually all states). CMP exploit the different timing of establishment of these corporations across states by constructing a cumulative sub-index ranging in value between 0 and 1 which is the average of four dummy variables, one for each organisation. At any point of time the dummy for an organisation takes the value of 1 if it is in place and 0 otherwise.
- b) CMP also assess the role of the public sector via the governments' signalling of their relative priorities through the allocation of public resources towards economic

---

<sup>9</sup> This variable is coded as the number of times the website is updated in a month, thus a monthly update has the value of 1, a weekly update has the value of 4.5, a daily update is equal to 30, an annual update is equal to 1/12, etc.

<sup>10</sup> Note that this variable is only available for the apex business association but not for the sectoral associations, therefore it is included in the SBR measure only when the latter is computed over the apex body only (i.e. assigning a weight of 100% to the apex body variables).

activities. They measure this by the share of state **expenditures on economic services** as a ratio of total government expenditures and by the share of **industry expenditures** in total expenditures on economic services. Industry expenditure is that part of expenditure on economic services which is most closely related to SBR promotion activities.<sup>11</sup>

### 3.3. The interaction between states and businesses (SBR Practice)

CMP measure the interaction between state governments and the business sector in two ways:

- a) **Index of labour regulation:** Industrial relations in India fall under the joint jurisdiction of the central and state governments under the Indian constitution. Industrial relations are governed by the Trade Unions Act of 1926, which specifies the conditions that a trade union needs to satisfy in order to be recognised under the act and the Industrial Disputes Act (IDA) of 1947, which sets out the institutions for adjudication of disputes (Pages and Roy 2008). The IDA has been extensively amended by state governments during the post-independence period. CMP use the index of labour regulation proposed by Besley and Burgess (2004), who code each state amendment as neutral (0), pro-worker (+1) and pro-employer (-1), and then cumulate the scores over time for the period 1947-1997. CMP update this index to 2006. As CMP argue, a closer degree of interaction between business and state governments would be reflected in more pro-employer labour market regulation.<sup>12</sup>
- b) **Stamp Duty:** CMP take state-wise stamp duties as proxies for the attitude of the state governments towards business establishments and their expansion. These proxies are valid because a stamp duty is a tax on the value of a transaction, most commonly on the transfer of movable and immovable properties and instruments used in commercial and business transactions. Moreover, stamp duties are one of the major sources of revenues for state governments and one of the few tax rates which state governments have the power to levy, when most tax rates are set by the Central government.

### 3.4. Mechanisms to avoid collusive behaviour (SBR Collusive)

CMP use the following measures to capture the transparency of SBRs:

---

<sup>11</sup> This is corroborated by CMP fieldwork results which indicate that only industry departments engage with the business sector in a 'significant' manner, identifying its needs and facilitating its operations.

<sup>12</sup> A similar argument is made by Rodrik and Subramanian (2004, p.17) who suggest that the Besley-Burgess index is "a measure of how pro-labour (and anti-business) the environment in different states was."

- a) The gross output of firms belonging to **delicensed industries** as a proportion of total industrial GDP. The License Raj was a system of centralised controls regulating entry and production activity introduced by the Indian federal government in and which applied to all states in India. There were two waves of delicensing as part of economic reforms, the first in 1985, and the second in 1991. Delicensing introduced competition and reduced rent-seeking by corporations entrenched with public powers. As argued by Aghion et al. 2006, p. 5, "Since the Licensing Committee reviewed applications on a sequential, first-come, first-served basis, and the five-year plans laid down targets or ceilings for industrial capacity, this provided an incentive for pre-emptive license applications. This system tended to favour the larger industrial houses (e.g. Birla, J.K. and Tata) which were better informed and organised and submitted multiple early applications as a means of foreclosing on plan capacity." As the decision of what industries to delicense was made at the central level, this effectively provides an exogenous source of change in the possible extent of collusive behaviour at the state level.
- b) Whether the private sector umbrella association has a **regular publication** informing its members. This measure captures the transparency of the organisation's activities. Higher transparency would be associated with lower probability of collusive behaviour which may harm business not entrenched with public authorities.
- c) The **frequency** with which the publication is produced and distributed. As in the case of the organisation's website, this frequency would also determine the level of transparency in the association's activities.<sup>13</sup>

As CMP correctly argue, the indices constructed through these variables have two main advantages over the traditional investment climate indicators. First, they cover a larger time span than any other indicators on India states. This allows one to examine the evolution of the relevant economic institution over different periods. Second, by not being based on firms' perceptions, they avoid the measurement error problem typical of subjective survey response data. Bertrand and Mullainathan (2001) argue that the likely causal correlation of this measurement error with dependent variables may generate biased estimated coefficients.

CMP normalise the data so as to make the individual variables vary over a common range and to make the increase in a variable signal an improvement in the index. Then they use equal weights for each of the sub-components of the four dimensions of effective SBRs to

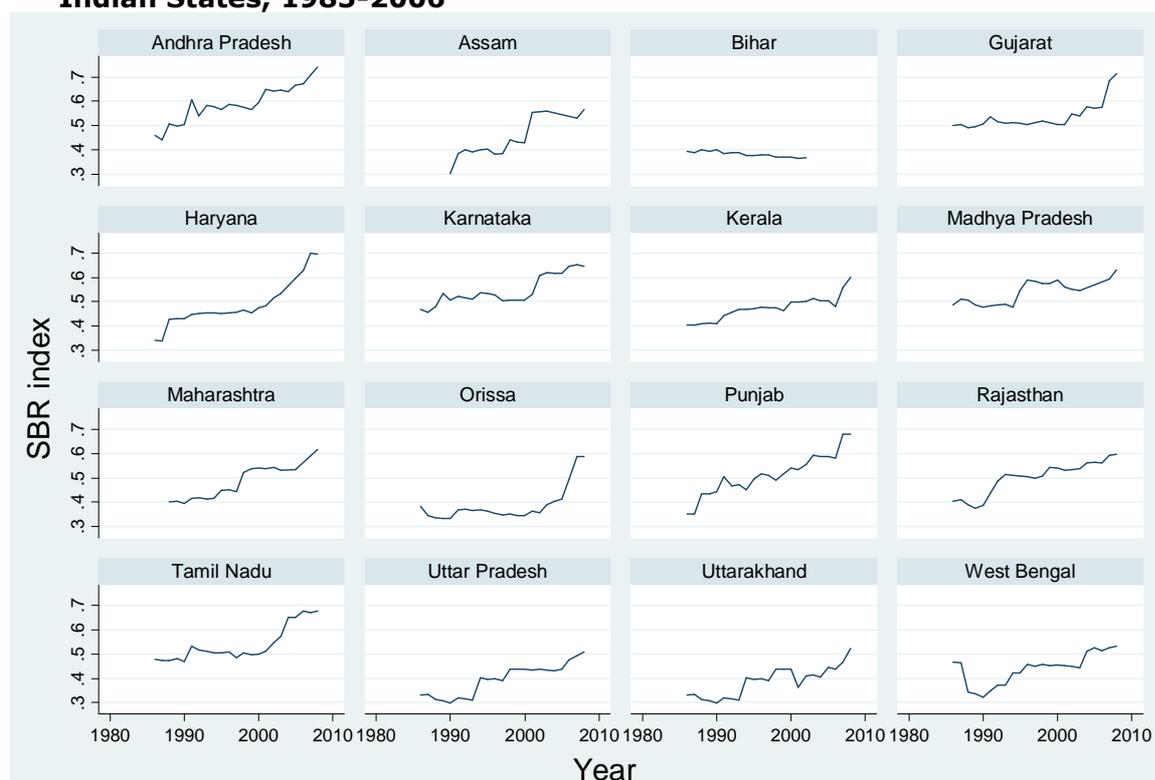
---

<sup>13</sup> This variable is coded analogously to the frequency of website update.

arrive at the four components of SBR Private, SBR Public, SBR Practice and SBR Collusive, which are then aggregated to obtain the overall SBR measure.<sup>14</sup>

Figure 1 captures movements of state-wise SBR measures in the period 1985-2006. We can infer that the SBRs of Southern states - Andhra Pradesh, Karnataka, TN, and Kerala - show similar movements and generally show an upward trend. The initial values of the SBR index for Karnataka and Tamil Nadu are relatively higher than those of other states. However, for Andhra Pradesh, the SBR index has moved the fastest among all the southern states. Kerala has shown significant improvement only recently. Amongst the states in Eastern, Northern and Western India, there has not been much improvement in Bihar and Madhya Pradesh over time. In the case of West Bengal, the SBR index started at a relatively high level, went into deep decline in the late 1980s with recovery starting only in the mid 1990s. Are these different patterns of SBR evolution across Indian states causally related to economic growth in these states? We next set out our empirical strategy which we will employ to address this question.

**Figure 1: Evolution of the Effectiveness of State Business Relation measure in Indian States, 1985-2006**



<sup>14</sup> To obtain the SBR Private component, the apex business association is given a weight of 0.5 and the two sectoral associations are given weights of 0.25 each. CMP experiment with different weights for apex and sectoral business associations and find that there is a strong correlation between SBR measures obtained under different weighting schemes. We adopt these weights for the main regressions but our results are also robust to the use of SBR indices calculated through different weights (i.e. assigning the same weight of one third to each, or assigning all the weight to the apex body).

## 4 EMPIRICAL STRATEGY, DATA AND DESCRIPTIVE STATISTICS

In this section, we present the empirical specification used in the regressions, discuss the econometric methodology and describe the data.

### 4.1. Empirical Specification

Our interest centers around the effect of our measure of state business relations on state level per capita incomes. We estimate regressions of the following generic form:

$$Y_{it} = \alpha + \beta_0 Y_{it-1} + \sum_k \beta_k X_{ikt} + \rho SBR_{it} + v_t + u_i + e_{it} \quad (1)$$

Where  $i$  designates the state,  $t$  designates time,  $Y$  is the logarithm of real GDP (state domestic product) per capita,  $SBR_{it}$  is our measure of state-business relations described in the previous section, and  $X_{ikt}$  is a vector of standard control variables. The error terms  $v_t$  and  $u_i$  capture the time-invariant and state-invariant components of the error term, while  $e_{it}$  is the white noise component of the error term. The presence of the lagged GDP term,  $Y_{it-1}$  captures two important and opposite effects on growth. Firstly, it captures path dependence in growth experiences as has been found to be the case in most historical accounts of economic growth (Rodrik 2003). This would determine a positive coefficient of the lagged GDP term. Secondly, it captures the conditional convergence hypothesis predicted by the neoclassical theory of economic growth – this channel would push the coefficient of the lagged GDP term in the other direction (i.e. negative), as countries are experiencing a slowdown in economic growth relative to their steady-state output level (Barro and Sala-i-Martin 1992a, Islam 1995, Caselli *et al.* 1996). The year effects  $v_t$  have been included to capture year-specific national level shocks, such as weather shocks (e.g. monsoon failures), oil price shocks, and other macroeconomic shocks that may affect output across all states in a given year. In addition, to the extent that both SBR and growth rate at the national level experience a common increasing trend over time, not including year effects would incur the risk of generating a spurious relationship between the two variables. The state specific effects  $u_i$  capture innate cultural and geographical properties of states (such as differences in agroclimatic factors and whether a state is land-locked or coastal) that are time-invariant, and may have an important role in explaining economic growth across Indian states (Palmer-Jones and Sen 2003).

With respect to the control variables, we experiment with two sets of such variables. We have a basic set of control variables which are demographic factors such as rural and urban population and the female-male ratio. In addition, we introduce dummies for the

split of the states of Bihar, Madhya Pradesh and Uttar Pradesh in 2000, which would have impacted on economic activity in these three states since 2000. In some regressions, we also introduce some additional controls to test for the robustness of our results. These controls include proxies for human and physical capital which are arguments of the standard production function. These additional controls are the literacy rate and per capita expenditures by the state on education and health to capture for the effect of human capital formation on economic growth (Mankiw, Romer and Weil 1992).<sup>15</sup> The inclusion of health expenditures is also justified by the fact that a healthy population is more productive (Bloom, Canning and Sevilla 2004). We also include the real cost of power supply as an indirect proxy for investments in infrastructure and state-specific average rainfall per year to take into account the differential effects that variations in rainfall across India for a particular year may have on state-level agricultural incomes.<sup>16</sup>

Finally, in some specifications, we include state-specific time trends in addition to year and state effects to capture state-specific long term trends of SBRs and growth. For example these may capture differential rates of change in technology underlying the very different cropping patterns in agriculture across our fifteen states. Imagine a state whose major crop is subject to a technological breakthrough, which drastically increases the productivity of its cultivation over time. This would have a long-term growth enhancing effect, which is independent of any evolution in the state's economic institutions, such as SBRs. Failing to control for such trend could generate a bias in the SBR coefficient if this is also characterised by a time trend. As it turns out the inclusion of state-specific trends substantially reinforces the SBR coefficient, indicating that such mechanisms just described have been operating in Indian states in recent decades.

#### 4.2. Econometric Methodology

Equation (1) is in a dynamic panel data specification. As is well known, the presence of the lagged dependent variable in equation (1) leads to inconsistent estimates due to the endogeneity of the latter term. A natural solution for the first-order dynamic panel data models is to use General Method of Moments (GMM) (see Arellano & Bond, 1991 and Blundell & Bond, 1998). However this method is only efficient asymptotically and is suitable for samples with large N and small T. In our case, we have a small N (15 states)

---

<sup>15</sup> We use per capita education and health expenditures rather than the share of these expenditures on GDP as the latter could be regarded as endogenous to economic growth.

<sup>16</sup> We lag this variable by three years to take into account that current costs of electricity may be endogenous to growth – as demand for power rises with growth, and with sticky energy supply response, costs of power supply may rise. Also, by using the real cost of power supply as a measure of infrastructural development rather than per capita electrification as is conventionally used in growth empirics on India, we are less susceptible to the argument that infrastructural development is endogenous to economic growth – fast growing states would be able to afford higher levels of investment in infrastructure.

with a relatively large T (22 years). Therefore the GMM estimation may not be appropriate.<sup>17</sup> Instead we use the Least Squares Dummy Variable Corrected (LSDVC) estimator, a method originally proposed by Kiviet (1995) and Bun and Kiviet (2003), and extended by Bruno (2005) to unbalanced panels like the one used in this study. This method has been proposed precisely as a suitable dynamic panel data technique in the case of small samples, where GMM cannot be applied efficiently (see Meschi and Vivarelli, 2009 for an application). To illustrate the working of this method let us re-write our autoregressive panel data model in (1) in matrix form as follows:

$$Y = S\mu + \Gamma\delta + \varepsilon \quad (2)$$

where Y is the vector of observation for state income per capita, S is the matrix of state-specific dummies,  $\mu$  is the vector of state effects,  $\Gamma$  is the matrix of explanatory variables including also the lagged income per capita term and the SBR variable,  $\delta$  is the vector of coefficients and  $\varepsilon$  is the vector of the error terms. The standard least square dummy variable (LSDV) estimator associated with (2) is the following:

$$\delta^{LSDV} = (\Gamma' A \Gamma)^{-1} \Gamma A' Y \quad (3)$$

where A is the standard within group transformation which purges (2) of the individual effects.

This estimator is biased due to the presence of the lagged dependent variable and Bun and Kiviet (2003) show that the most accurate approximation of this LSDV bias is:

$$B_3 = c_1(T^{-1}) + c_2(N^{-1}T^{-1}) + c_3(N^{-1}T^{-2}) \quad (4)$$

where  $c_1$ ,  $c_2$  and  $c_3$  are parameters estimated by Bun and Kiviet (2003) via Monte Carlo simulations. We use this correction for the LSDV bias, thus employing the following LSDVC estimator:

$$\delta^{LSDVC} = \delta^{LSDV} - B_3 \quad (5)$$

We use the Arellano-Bond estimator to initialize the procedure to compute the estimator in (5) since the bias approximation depends on the unknown population parameters.<sup>18</sup> We use bootstrapped standard errors (with 100 iterations) rather than the asymptotic standard errors for the coefficients estimated through LSDVC, as the latter may generate unreliable t-statistics in small samples.

The LSDVC estimation is valid only in the presence of exogenous regressors. To the extent that the SBR measure may be endogenous to economic activity, the SBR coefficients would be biased and the LSDVC method would be invalid. There may be two types of endogeneity here: one driven by an omitted variable, and one driven by reverse causality.

<sup>17</sup> In fact applying GMM estimation to our panel yields more instruments than observations.

<sup>18</sup> The other two possible options for initialising the procedure are the Anderson-Hsiao, and the Blundell-Bond estimators. However the Arellano-Bond estimator is considered as the best established panel data estimator implemented in the STATA econometric package (Meschi and Vivarelli, 2009), which we use here.

The former could occur for instance if a successful private sector drove both sustained economic growth and pro-business reforms (captured by an increasing SBR measure). In that instance part of the eventual correlation between SBR and growth would be driven by the omitted private sector variable. Similarly, an increased rate of economic growth may provide more space for the government to enact business-friendly reforms in an attempt to facilitate the future growth process. On the other hand, the same situation may act as an incentive to obtain concessions from businesses in favour of workers as the former are already gaining from increased growth. We do not speculate here around which situation may be more likely in the Indian context. However we do acknowledge that this may be a potential issue. This potential endogeneity calls for an instrumentation strategy for our main SBR variable.

In order to control for the potential endogeneity of the SBR variable, we proceed in two stages. We first regress the SBR variables on a set of instruments which are supposed to be exogenous in specification (1) affecting per capita GDP growth via the SBR measure only. This is run through the following specification:

$$SBR_{it} = b_0 + BK_{it} + \gamma_t + \eta_i + \varepsilon_{it} \quad (6)$$

where K is the matrix of instruments. Taking the fitted value  $\widehat{SBR}_{it}$  from (6), we can plug it into specification (1) estimated it via the LSDVC method:

$$Y_{it} = \alpha + \beta_0^{LSDVC} Y_{it-1} + \sum_k \beta_k^{LSDVC} X_{ikt} + \rho^{LSDVC} \widehat{SBR}_{it} + v'_t + u'_i + e'_{it} \quad (7)$$

We propose two types of instruments to estimate equation (6) drawing from India's political history: one based on land reform legislation enacted by Indian states in different points in time, and the other based on the nature of the political regime in a given state.

Land reform was implemented under the 1949 Indian Constitution, according to which states are granted the powers to enact (and implement) land reforms. Each state parliament implemented the reform through autonomous acts. There are significant differences in the intensity with which states have enacted the various types of land reform legislation over time. Such differences have been captured by Besley and Burgess (2000) who construct a panel data type land reform variable, by cumulating land reform acts between 1957 and 1992 in the major Indian states.<sup>19</sup> Since there has not been any major land reform legislation since 1992 (see World Bank 2007), we retain the same values for the land reform variable for the post-1992 period.

---

<sup>19</sup> Besley and Burgess (2000) classify land reform legislation into four types of legislation: tenancy reform, abolition of intermediaries, land ceiling legislation, land consolidation legislation. We do not differentiate here between the various types as we use only the total cumulative number of acts as an instrument.

Land reform legislation was intensely political in India. We postulate that the political process underlying SBR was the mirror image to that underlying land reform legislation. States which implemented land reform aggressively were likely to be concerned mainly with the rural sector and the rural poor, while being relatively insensitive to the needs of the industrialists. The reverse argument should apply as well. Therefore we would expect the intensity of the land reform legislation to be inversely related to the quality of SBRs. The data confirms that this is very much the case with one caveat that we examine below. Using the cumulative land reform variable (CLR), Besley and Burgess (2000) show that land reform had a significant impact in reducing poverty (and increasing agricultural wage) across states over time. On the other hand, and importantly for our purposes, land reform legislation did not have any significant effect on the rate of growth of the state economy as a whole. This is the necessary exclusion restriction condition for using land reform legislation as a valid instrument for SBR.<sup>20</sup>

The second type of instrument is based on the results of the political elections at the state level. We exploit the fact that SBRs are the outcome of a political process, with different groupings in state legislatures (the *Vidhan Sabha*) having different propensity to engage with businesses. We use data from records of the number of seats won by different national parties at each of the state elections under four broad groupings in line with the classification by Besley and Burgess (2000). We update their data to the most recent elections. The parties contained in the relevant groups are given in parentheses after the name of the grouping. These are (i) Congress Party (Indian National Congress + Indian Congress Socialist + Indian National Congress Urs + Indian National Congress Organization), (ii) a *hard left* grouping (Communist Party of India + Communist Party of India Marxist), (iii) a *soft left* grouping (Socialist Party + Praja Socialist Party) and (iv) Hindu parties (Bhartiya Janata Party + Bhartiya Jana Sangh). We express these as a share of total seats in the legislature (the excluded groups are independents and regional parties). We lag these variables one year to decrease the potential concern about their endogeneity.<sup>21</sup>

#### 4.3. Data

The data on state domestic product (net state domestic product in constant 1980 prices) is obtained from the EOPP database at the London School of Economics Economic and

---

<sup>20</sup> By using land reform legislation and not the actual implementation of land reforms as a proxy of the anti-business attitude of state governments in India, we avoid the possibility that land reform implementation may be correlated with growth and therefore, cannot be a valid instrument. Deininger, Jin and Nagarajan (2009) show that land reform implementation in India has had a positive effect on household incomes and accumulation of physical and human capital, though their effect on economic growth is unclear.

<sup>21</sup> However, our results are generally robust to longer lags (i.e. up to four years).

from the Reserve Bank of India's online Database on the Indian Economy.<sup>22</sup> The demographic data is from the decennial Census of India and have been interpolated to obtain annual data. Per capita state education and health expenditures are obtained from the EOPP database, and updated after 1992 through the Reserve Bank of India Bulletins.<sup>23</sup> The data on the cost of power supply (in Paise per Kilowatt Hours) is from the Planning Commission (2002). The rainfall data (average monthly rainfall in millimetres) is from the EOPP data-base and updated from the Compendium of Environment Statistics 2002 published by the Central Statistical Organisation, Government of India.

Table 1 presents the summary statistics of the data used in the regressions. The aggregate SBR measure has a mean of 0.48, with a standard deviation of 0.09 for the full sample. Among the four components of SBR, SBR Collusive has the highest standard deviation (0.25) and the largest maximum value (0.91).

**Table 1. Descriptive Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
SBR	362	0.48	0.09	0.30	0.74
SBR Collusive	544	0.42	0.25	0.00	0.91
SBR Practice	438	0.57	0.12	0.00	0.85
SBR Public	379	0.43	0.08	0.18	0.80
SBR Private	544	0.32	0.17	0.00	0.85
Log of State Domestic Product	513	7.62	0.46	6.64	8.78
Congress share of seats	569	0.40	0.26	0.00	0.93
Hard Left share of seats	569	0.08	0.16	0.00	0.67
Soft Left share of seats	569	0.13	0.20	0.00	0.84
Hindu share of seats	569	0.11	0.17	0.00	0.75
Per Capita State Expenditure on Education (log)	465	11.84	1.12	9.50	14.08
Per Capita State Expenditure on Health (log)	465	10.68	0.88	8.31	12.53
Cumulative land reform	345	2.06	1.92	0.00	9.00
Total Population (log)	515	10.67	0.62	9.05	12.13
Rural Population (log)	515	10.34	0.61	8.76	11.88
Cost of Power (log)	419	4.50	0.89	2.62	6.38
Literacy Rate	571	54.03	16.55	22.57	91.70
Female to Male Ratio	515	0.94	0.06	0.63	1.19
Monthly Rainfall (log)	459	5.42	0.64	3.65	7.37

**Notes:** SBR is the aggregate SBR measure; while SBR Collusive, Practice, Public and Private are the four components of SBR; CLR is cumulative land reform acts for each state; Congress, Soft Left, Hard Left and Hindu are shares of total seats in state legislatures for Congress Party (Indian National Congress + Indian Congress Socialist + Indian National Congress Urs + Indian National Congress Organization, Communist Party of India + Communist Party of India Marxist, Socialist Party + Praja Socialist Party, and Bhartiya Janata Party + Bhartiya Jana Sangh, respectively.

<sup>22</sup> The original source of the state domestic product data is Ozler, Datt and Ravallion (1996). The EOPP data-base is available at: [www.sticerd.lse.ac.uk/eopp/research/indian.asp](http://www.sticerd.lse.ac.uk/eopp/research/indian.asp)

<sup>23</sup> The original source is the Public Finance Statistics published by the Ministry of Finance, Government of India. Education expenditures is the budget line – expenditures on education, sports, art and culture – and health expenditures is total expenditures on medical and public health.

## 5 RESULTS

We begin by addressing the possible endogeneity of the SBR variable, and of its components, so as to be able to properly apply the LSDVC method. We perform the first stage estimation by running equation (6) in order to purge the endogenous component of the SBR variables. Table 2 presents the results. In line with our priors, land reform legislation (lagged two years) appears to be negatively and significantly associated with the SBR variable (column 1).<sup>24</sup> The electoral results variables are also broadly in line with the expectations although they are not significant. Congress parties are associated with increasing SBRs, while hard left parties are associated with decreasing SBRs. On the other hand, soft left and Hindu parties decrease the SBR measure. The lack of significance of the electoral variables suggests that SBRs are not driven mainly by the electoral results. The F-test strongly rejects the hypothesis that the instruments are jointly not significantly different from zero, reinforcing the belief that these variables are good predictors of SBRs.<sup>25</sup>

In columns (2), (3) (4) and (5) we perform the same analysis using the four components of the SBR index as dependent variables, i.e. *SBR private*, *SBR public*, *SBR practice* and *SBR collusive* respectively. The fitted values from these regressions will be used to disentangle the effects of the different components of SBRs on growth. Again, land reform is negative and highly significant in all cases except for *SBR public*, when it is instead positive (column 3). This suggests that states which are relatively more institutionally organised vis-à-vis the private sector have also implemented land reform legislation more aggressively. We find that *productive corporations* and the *share of economic services expenditures* are the two variables composing *SBR public* that drive this result (results not shown here). This positive correlation seems to be driven by the general level of activity by governments. Those governments which are relatively active tend to be more active both in industrial policy, e.g. by setting up productive corporations, and in agricultural policy, e.g. by implementing land reform more aggressively (and possibly in the other areas of governments as well). This positive correspondence is instead reversed for the other SBR components as postulated in section 4.1 (columns 2, 4 and 5). These results highlight an important distinction between the public sector aspect of SBRs and its operationalisation dimensions (*SBR practice* and *SBR collusive*). It is only using the latter measures, which captures more closely the actual attitude of the government towards the

---

<sup>24</sup> Note that the results of land reform are not qualitatively affected by using slightly shorter or longer lags (i.e. 1 or 3 years).

<sup>25</sup> Although the electoral variables are individually insignificant, the F-test rejects the hypothesis that they are jointly insignificantly different from zero.

business, that a certain dichotomy between rural and industrial attitudes of governments emerges.

We also test the robustness of the results to using a SBR index calculated without using data for the two major sectoral associations but only for the main business association in each state (the apex body). The results are little affected and the land reform coefficient is identical (column 6). Finally this coefficient is minimally affected when excluding the electoral variables from the regression (column 7).

**Table 2. First stage regressions for SBR variables**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Method	FE						
Dep. variable	SBR	SBR private	SBR public	SBR practice	SBR collusive	SBR_ape x	SBR
CLR (-2)	0.026*** (0.004)	0.026*** (0.005)	0.019*** (0.005)	0.062*** (0.012)	-0.024** (0.011)	0.026*** (0.006)	0.022*** (0.005)
Congress (-1)	0.027 (0.017)	-0.016 (0.064)	0.050 (0.031)	0.021 (0.031)	0.049 (0.074)	0.014 (0.035)	
Hard left (-1)	-0.120 (0.107)	0.136 (0.139)	-0.121 (0.091)	-0.613 (0.404)	0.258 (0.248)	-0.190 (0.155)	
Soft left (-1)	-0.014 (0.026)	-0.108* (0.056)	0.039 (0.033)	-0.014 (0.044)	-0.018 (0.083)	-0.046 (0.055)	
Hindu (-1)	-0.051 (0.034)	-0.139 (0.081)	-0.005 (0.029)	0.008 (0.074)	-0.185* (0.104)	-0.016 (0.051)	
Other contr.	YES						
F-statistics	12.08	9.67	11.16	28.14	2.97	7.81	
R-sq (within)	0.794	0.782	0.340	0.466	0.886	0.687	0.772
Observations	337	509	354	408	509	337	337
Nr. of states	15	15	15	15	15	15	15

*Robust standard errors in parentheses: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; all regressions include year and state effects. CLR is the cumulative land reform acts for the 15 major Indian states obtained from Besley and Burgess (2000). Besley and Burgess provide data till 1992; we assume that no land reform legislation has occurred since 1992 for the 15 states (see text for justification). Congress, Soft Left, Hard Left and Hindu are shares of total seats in state legislatures for Congress Party (Indian National Congress + Indian Congress Socialist + Indian National Congress Urs + Indian National Congress Organization, Communist Party of India + Communist Party of India Marxist, Socialist Party + Praja Socialist Party, and Bhartiya Janata Party + Bhartiya Jana Sangh, respectively. The data is obtained from Besley and Burgess (2000) and updated to the most recent elections. Other controls include population controls (ln of urban and rural population and female-male ratio) and controls on the split of Bihar, Madhya Pradesh and Uttar Pradesh in November 2000. F-stat is the statistics for the F-test of the hypothesis that all instruments are jointly not significantly different from zero.*

We next use the fitted values derived from the estimation of Table 2 in the place of the SBR measures to estimate equation (7) using the LSVDC method. The estimates are

presented in Table 3. Year and state effects are common to all the regressions. In column (1), we regress log state-level GDP on its one period lag, and the SBR variable, with the basic demographic controls. In line with the expectations the SBR coefficient is positive and significant at the 10% level. The demographic controls have all very little significance and the controls for the split of the three states have negative but not significant effect on growth. In column (2), we add the controls for human capital, health, infrastructure and climactic factors. The SBR coefficient becomes substantially larger and significant at one per cent level when we include these extra controls. As shown in column (3) where we replicate the same regression as in column (1) but using the sample of column (2) this effect is driven partly by the smaller sample for which the extra controls are available and partly by the effect of the extra controls which increase the SBR coefficient. The only significant control among the ones added in column (2) is rainfall, which has a positive impact on economic growth probably through its effect on agricultural production. When we include state-specific time trends, the SBR coefficient rises further (column 4) and it is little affected by the addition of the extra controls (column 5). Confining our discussion to the specifications which include state-specific time trends, as these appear to be the most robust results, we see that the coefficient of the SBR variable varies from 1.14 to 1.25. This implies that on average a one per cent increase in the SBR measure leads to a three per cent increase in long-run growth.

We then investigate which dimensions are driving the positive impact of SBR on growth. In column (6), we present results with the SBR measure decomposed into its four components – *SBR private*, *SBR public*, *SBR practice* and *SBR collusive*, again with the basic controls. *SBR private* is the only dimension not significantly different from zero. The others have the expected positive sign except the public sector variable, which is negative and significant. Interestingly, among the four components of the SBR measure, the component that is highly significant at the 1 per cent level is *SBR practice*. Since this is the variable that most closely measures the pro-business attitude of the government, our findings seem to confirm the conclusions reached by De Long (2003), Rodrik and Subramanian (2004) and Kohli (2006, 2007) that the attitudinal shift of the government towards the private sector was be an important driving force behind the growth acceleration that occurred in India since the mid 1980s. While the findings of these previous studies relate to the national level and to the change that occurred in attitudes of the Congress led central governments of Indira Gandhi and Rajiv Gandhi towards business in the 1980s, our results indicate that similar attitudinal shifts among governments in India at the sub-national level may have an important determinant of state-level growth

since the mid 1980s.<sup>26</sup> The negative coefficient of the *SBR public* variable suggests that the active involvement of the state in the economy, e.g. via the establishment of state controlled productive corporations and the expenditures on economic services, has an adverse effect on growth. These results indicate that the key dimensions of SBRs that stimulate economic growth seem to be those related to the actual interactions between states and businesses rather than those related to the formal organisations (both public and private) in place to favour such interactions. In fact the excessive focus on the latter may be even counterproductive for economic growth.<sup>27</sup>

---

<sup>26</sup> Rodrik and Subramanian (2004) find that growth rate of per capita income was higher in states where the party in power was allied with the ruling party at the Central level in the 1980s and 1990s. Since most central governments in these two decades were Congress led, and we have observed from Table 3 that effective SBRs were positively correlated with Congress led state governments, our results supports this specific finding of the Rodrik-Subramanian paper.

<sup>27</sup> There is an extensive literature in the Indian context that documents the problems of over-staffing and weak management of state-level corporations and the crowding out effects of public expenditures on private investment, particularly those undertaken by state governments (Mundle and Rao 1997). As Maxfield and Ross Schneider (1997) argue, 'even when cohesive, coherent state structures do exist, they need close and continuous connection to a broad set of private firms in order to make a real contribution to economic transformation' (p. 70). In the Indian case, corporations set up by various state governments were run as non-Weberian style bureaucracies and often degenerated into aggregations of rent-seeking individuals and groups.

**Table 3. SBR and growth across Indian states, 1985-2006**

Method	(1) LSDVC	(2) LSDVC	(3) LSDVC	(4) LSDVC	(5) LSDVC	(6) LSDVC
Y (-1)	0.839*** (0.060)	0.735*** (0.066)	0.797*** (0.077)	0.647*** (0.048)	0.576*** (0.071)	0.550*** (0.052)
SBR (fitted)	0.253* (0.131)	0.702*** (0.270)	0.516 (0.437)	1.245*** (0.267)	1.144*** (0.235)	
SBR private (fitted)						-1.033 (0.857)
SBR public (fitted)						-2.365** (0.932)
SBR practice (fitted)						0.948*** (0.235)
SBR collusive (fitted)						1.140* (0.596)
Female/male ratio	0.068 (0.103)	0.205 (0.260)	0.087 (0.176)	0.630 (0.744)	-0.043 (0.901)	0.071 (0.730)
Tot pop (ln)	-0.190 (0.300)	-0.511 (0.718)	-0.199 (0.401)	-0.971 (1.682)	0.209 (1.724)	-0.221 (1.605)
Rural pop (ln)	-0.040 (0.190)	-0.037 (0.517)	-0.074 (0.444)	-0.405 (0.299)	-0.246 (1.194)	-0.206 (0.248)
Uttar Pradesh x Post-2000	-0.046 (0.035)	-0.063 (0.060)	-0.050 (0.035)	-0.043 (0.058)	-0.005 (0.095)	-0.255** (0.110)
Madhya Pradesh x Post-2000	-0.085 (0.076)	-0.139 (0.163)	-0.053 (0.121)	-0.473 (0.571)	0.084 (0.610)	0.154 (0.572)
Bihar x Post-2000	-0.079 (0.049)	-0.205 (0.127)	-0.155 (0.096)	-0.300 (0.453)	-0.035 (0.337)	-0.225 (0.426)
Rainfall (ln)		0.057*** (0.020)			0.078*** (0.025)	
Literacy rate		0.002 (0.004)			-0.009 (0.014)	
Log cost power supply (-3)		-0.018 (0.046)			0.015 (0.064)	
per cap revenue exp. on edu (-4)		0.050 (0.071)			0.111 (0.093)	
per cap rev. exp. on health (-4)		-0.020 (0.046)			-0.019 (0.050)	
State trends	NO	NO	NO	YES	YES	YES
Observations	311	235	235	311	235	311
Nr. of states	15	15	15	15	15	15

*Bootstrapped standard errors in parentheses (bias correction initialized by Arellano-Bond estimator): \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; all regressions include year and state effects. The dependent variable is log per capita real State Domestic Product, and Y(-1) is one year lagged log per capita real State Domestic Product. SBR variables are the fitted values from Table 2, using electoral results and land reform legislation as excluded instruments.*

In Table 4 we present the results of a battery of robustness tests which address the main possible methodological concerns about the results. One possible issue has to do with the fact that the SBR index has been computed averaging data for the apex business

association and for the two major sectoral associations as explained in section 3.<sup>28</sup> However, it may be in fact that the only relevant private sector association as far as SBRs are concerned is the main apex body in each state, as that is often the official representative of businesses in state-level discussions. We test whether this concern is founded by using the fitted value of the SBR measure computed using only data for the Apex body but not for the sectoral associations (from Table 2, column 6). The results – reported in column (1) – are very similar to those of Table 3 (cf. column 4), also when using the set of extra controls (column 2 vs. column 5 in Table 3). The results are qualitatively unaffected also when we use the fitted values of the individual SBR dimensions computed only with the Apex body data (column 3). When we add the extra set of controls to this regression, the absolute value of the coefficients of all SBR dimensions increase and SBR private becomes significant (and remains negative). This result reinforces the possible dichotomy identified above between the (growth enhancing) effects of the actual interactions between states and businesses and the (growth reducing) effects of the formal organisations in place to favour such interactions. A further concern may be related to the fact that the SBR values are fitted using also variables based on previous electoral results. As discussed such results can be viewed as fairly exogenous shocks and have already been used by the literature as such (e.g. Besley and Burgess, 2000). However, due to persistence past economic growth rates, which probably influence electoral results, are likely to be correlated to future rates, thus generating a concern about the exclusion restriction of the electoral results' variables. To tackle such concern we use the fitted value of the SBR index computed without the electoral results' variables, i.e. using only land reform legislation as the excluded instrument for SBR (see Table 2, column 7). Again the results are qualitatively unaffected (column 5) also when adding the extra controls (column 6). However the size of the SBR coefficient increases four-fold. Such a large increase is possibly driven by the higher precision in the estimation of the fitted SBR variable using all the excluded instruments relative to the estimation using only land reform legislation.

A final issue relates to the economic linkages between neighbouring states which mainly operate through trade and migration. To the extent that these linkages are intense enough economic growth at the state level may be partly driven by regional dynamics. We control for these possible effects by adding a series of region-year interaction to the baseline regressions. These are based on regional dummies constructed by dividing India into three macro-regions: North-West, North-East and South. We include Orissa, Bihar, West Bengal and Assam into North-East, Andhra Pradesh, Karnataka, Kerala and Tamil

---

<sup>28</sup> In particular the weighting scheme affects the computation of the *SBR private* and *SBR collusive* sub-dimensions.

Nadu into South, and the other states into North-West. Despite being subjective we believe this division is arguably apt to capture eventual regional economic dynamics effectively.<sup>29</sup> Adding these region-year fixed effects (columns 7 and 8) change little the SBR coefficient, which remains highly significant with its magnitude decreasing only slightly (cf. columns 7 and 8 with Table 3, columns 4 and 5 respectively).

**Table 4. SBR and growth across Indian states 1985-2006, robustness**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	LSDVC							
Y (-1)	0.632*** (0.048)	0.572*** (0.068)	0.554*** (0.060)	0.547*** (0.065)	0.546*** (0.054)	0.539*** (0.065)	0.559*** (0.058)	0.511*** (0.067)
SBR_apex (fitted)	1.243*** (0.291)	1.029*** (0.357)						
SBR private apex (fitted)			-1.966 (1.220)	-2.381** (1.113)				
SBR public (fitted)			-3.655** (1.635)	-3.989** (1.659)				
SBR practice (fitted)			0.851*** (0.243)	0.885*** (0.277)				
SBR collusive apex (fitted)			1.690* (0.866)	1.719** (0.835)				
SBR (fitted)					4.995*** (1.101)	4.783*** (1.005)	0.930*** (0.256)	1.080*** (0.311)
Instruments	Election + CLR	Election + CLR	Election + CLR	Election + CLR	CLR	CLR	Election + CLR	Election + CLR
Basic controls	YES							
Extra controls	NO	YES	NO	YES	NO	YES	NO	YES
Region-year fixed effects	NO	NO	NO	NO	NO	NO	YES	YES
Observations	311	235	311	235	311	235	311	235
Nr. of states	15	15	15	15	15	15	15	15

*Bootstrapped standard errors in parentheses (bias correction initialized by Arellano-Bond estimator): \*\*\* $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ; all regressions include year, state effects and population controls (ln of urban and rural population and female-male ratio) and controls for the split of Bihar, Madhya Pradesh and Uttar Pradesh in November 2000 (i.e. basic controls). Extra controls include: literacy rate, log of real cost of power supply (lagged 3 years), log of per capita revenue expenditure on health, log of per capita revenue expenditure on education, log of average monthly rainfall (mm). Region-time fixed effects are a series of interactions between regional dummies and year effects (regional dummies are for based on a division of India into three regions: North-West, North-East and South, see main text for details). The dependent variable is log per capita real State Domestic Product, and Y(-1) is one year lagged log per capita real State Domestic Product. SBR variables are the fitted values from Table 2, using the instruments listed in this Table.*

We use the baseline range of values of the SBR coefficient from Table 3, i.e. the specifications without state-specific time trends and the basic set of controls (column 1) and that with state-specific time trends and the basic set of controls (column 4) to

<sup>29</sup> Importantly, the results are not much affected by relatively small changes to this division (e.g. including Bihar and Madhya Pradesh into North-East, or creating a further central region).

simulate the impact of an improvement in SBRs on economic growth. Other things being equal, if Bihar (one of the worst performing states in India) had the same average (fitted) value of the SBR index over 1985-2006 as Gujarat, its annual rate of growth would have been 2.5 percentage point higher over the same period. This is a substantial increase over Bihar's actual average rate of growth of 1.4%. Similarly its growth rate would have increased by 12% relative to its growth trend over the same period. The increase in the growth rate for Bihar would have been even more pronounced (5.5 percentage points higher) had it had the same average value of Haryana, the state with the highest average fitted value of the SBR index. These are only empirical simulations which are unlikely to apply to the real world (inter alia as the condition 'other things being equal' does not work in reality), but they provide some evidence of the potential importance of effective SBRs in stimulating economic growth.

Although these results are quite clear and seem to be plausible to us, they need to be interpreted with a particular note of caution, especially as far as the individual SBR dimensions are concerned. In fact they rely on a measurement of the SBR dimensions which is based on the decision of what variables to include in each dimension. Although CMP have made substantial efforts to characterise such dimensions through the most appropriate variables, this choice is still inherently subjective, and to some extent it has been driven by the possibility to access the data. In this sense it is disputable for instance whether the way in which the organisation of the public sector vis-à-vis the private sector is properly captured by our composite *SBR public* index. Although to our knowledge this is the most comprehensive characterisation of SBRs available in the literature, we believe that further research, especially on the sub-dimensions, is needed to improve on the characterisation of this important economic institution.

## 6 CONCLUSIONS

So far, the literature on institutions and economic growth has focused its attention primarily on the predatory role of the state. The main finding of the empirical studies that form the basis of this literature is that economic growth has occurred in contexts where the state has respected the property rights of private producers and where it did not expropriate property or allows others to do so. However, these empirical studies have been subject to criticism in not being able to adequately isolate the effect of institutional quality from that of geography, to take into account innate country-specific differences in culture and initial conditions, and to satisfactorily address the possibility of reverse causality from economic development to improvements in institutional quality.

In this paper, we address an over-looked aspect of institutional quality in the empirics of economic growth – the effectiveness of the relationship between the state and the business sector – which we argue can play a decisive role in economic growth, independent of other factors that have been found to be important in explaining economic growth. Our empirical context is India, where the federal structure of the country and the significant political autonomy and independence in legislative powers enjoyed by state governments, along with regional variations in the collective strength of the economic and political elite, allows for the variation in regional institutional quality that helps us to identify its effects on economic growth.

We propose a measure that can capture the four dimensions of effective SBRs – i) the way in which the private sector is organised vis-à-vis the public sector; ii) the way in which the public sector is organised vis-à-vis the private sector; iii) the practice and institutionalisation of SBRs; and iv) the avoidance of harmful collusive behaviour. We find that this measure shows an unambiguous improvement in SBR across most Indian states over 1985-2006. However, we also find that the rate of improvement has differed widely across states, and has occurred at different points in time in different states. This suggests that state-specific political and economic factors have conditioned the nature of SBRs in any given state, and that these factors have differed across states and over time. In addition, there are some states where SBRs have remained stagnant for the period under consideration, indicating the path-stickiness of the institutions governing SBRs in these states.

Using the SBR measure, we estimate standard growth regressions for fifteen Indian states in dynamic panel form through the LSDVC method, which is suitable for panels with small N, like ours. We control for demographic factors, human capital, infrastructure, climactic factors, and state and year fixed effects which take into account innate geographical and cultural differences across states and macroeconomic shocks to output. We also control for the possibility of reverse causality from income growth to improvements in SBRs by using an instrumental variable method, and a set of instruments which are drawn from India's political history. Our results show that effective SBRs contribute significantly to economic growth across states in India. Thus, SBRs that 'take the form of active co-operation towards the goal of policies that both parties expect will foster investment and increases in productivity' (Bräutigam et al, 2002, p. 540), and consequently, increase economic growth. Interestingly, the results suggest that the key dimensions of SBRs that stimulate economic growth seem to be those related to the actual operations of the interactions between states and businesses. On the other hand the formal organisations (both public

and private) in place to favour such interactions seem to be even counterproductive for economic growth.

The findings of this paper support the conclusions of previous studies that subnational states in India followed very different strategies with respect to the private sector, with differing outcomes with respect to economic growth. Sinha (2003) argues that the state in Gujarat followed a proactive policy with respect to the provision of information to the private sector in contrast to the passive policies of West Bengal and Tamil Nadu, that these actions ensured “higher investment flows as well as a higher implementation of investment intentions” (p. 472) for the state of Gujarat relative to the states of West Bengal and Tamil Nadu. In addition, the economic reforms introduced incrementally by the central government in the mid 1980s and then more comprehensively in 1991, provided an institutional environment for peak business associations in India to engage in stronger collective action on behalf of the private sector and to pursue many developmentally oriented activities at both the national and subnational levels. Prior to 1991, peak associations representing business ‘did not enjoy a high status and there was an absence of mutual cooperation, trust and respect between business and government’ (Kochanek 1996, p. 158). With the change in the attitude of the state towards the private sector in the 1980s, there was an active encouragement of the state towards peak business associations such as Federation of Indian Chambers of Commerce and Industry (FICCI) and the Confederation of Indian Industries (CII) to transform themselves into *developmental* business associations (Sinha 2005). These business associations along with a responsive state that was credibly committing itself to private sector development were catalysts for synergistic SBRs to emerge both at the national and sub-national levels since the mid 1980s, which replaced the rent-seeking and collusive relationships that had characterised SBRs in India since the 1970s (Kochanek 1995). As our paper shows, where such synergistic SBRs emerged in Indian states, economic growth followed. An important policy implication of our findings is that the national state and peak business associations should support and broker more collaborative relations between sub-national states and the private sector where such synergistic SBRs have not emerged to the same degree. Our results indicate that the focus of this support for SBRs should be provided by strengthening the actual practice of SBRs rather than by establishing formal organisations to carry out such interactions.

While these findings are rooted in the Indian experience, they are in line with those of Sen and te Velde (2009) for a sample of sub-Saharan African countries. The fact that our results are based on institutional differences across states at different levels of development within the same country, on a particularly elaborate measure of SBRs, and

on empirical methods that address the main concerns of growth regressions should reinforce the possibility that these findings may well apply to other developing contexts as well. In this sense, the claim that good relations between business and government elites are not only possible but are often an important component of a country's growth path is one that should be taken more seriously by the literature in search for the determinants of economic development.

## REFERENCES

Acemoglu, D. S. Johnson and J. Robinson (2001) 'The Colonial Origins of Comparative Development'. *American Economic Review*, 91 (5), pp. 1369–1401.

Aghion, P. Burgess R., Redding S. and F. Zilibotti (2006), The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India, CEP Discussion Paper No 728.

Albouy, D. (2008), 'The Colonial Origins of Comparative Development: An Investigation of the Settler Mortality Data', NBER Working Paper No. 14130.

Arellano, M., & Bond, S. (1991), Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58, pp. 277–297.

Barro, R.J. and X. Sala-i-Martin (1991), "Convergence across states and regions", *Brookings Papers on Economic Activity*, Vol. 1, pp. 107-158.

-- (1992a), "Convergence", *Journal of Political Economy*, Vol. 100 (2), pp. 223-251.

-- (1992b), "Regional Growth and Migration: A Japan-United States Comparison", *Journal of Japanese and International Economics*, Vol. 6, pp. 312-346.

Bhagwati, J. N., Brecher, R. A. and Srinivasan, T. N. (1984), DUP Activities and Economic Theory, in D.C. Colander (Ed.) *Neoclassical Political Economy*, Cambridge: Ballinger, pp. 17-32.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87, 115–143.

Bruno, G. (2005). Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models, *Economics Letters*, 87, 361–366.

Bun, M. J. G., & Kiviet, J. F. (2003). On the diminishing returns of higher order terms in asymptotic expansions of bias. *Economics Letters*, 79, pp. 145–152.

Deininger, K., S. Jin and H.K. Nagarajan (2009), "Land Reforms, Poverty Reduction and Economic Growth: Evidence from India", *Journal of Development Studies*, Vol. 45(4), pp. 496-521.

Blejer, M. and Khan, M.S. (1984) 'Government Policy and Private Investment in Developing Countries', *IMF Staff Papers*, 31:379–403.

Bloom, D.E., D. Canning and J. Sevilla (2004), "The Effect of Health on Economic Growth: Theory and Evidence", *World Development*, Vol. 32(1), pp. 1-13.

Bräutigam, D., L. Rakner and S. Taylor (2002), "Business Associations and Growth Coalitions in Sub-Saharan Africa", *Journal of Modern African Studies*, Vol. 40(4), pp. 519-547.

Calì, M., S. Mitra and P. Purohit (2009), "State Business Relations in Indian States", *IPPG Discussion Paper No. 25*, available at [www.ippg.org.uk](http://www.ippg.org.uk).

Cammett, M. (2007), "Business-Government Relations and Industrial Change: The Politics of Upgrading in Morocco and Tunisia", *World Development*, Vol. 35, No. 11, pp. 1889-1903.

Cashin, P. and R. Sahay (1996), "Internal Migration, Center-State Grants and Economic Growth in the States of India", *IMF Staff Papers*, Vol. 43(1), pp. 123-171.

Caselli, Francesco, Gerardo Esquivel and Fernando Lefort (1996) 'Reopening the Convergence Debate: A New Look at Cross-country Growth Empirics'. *Journal of Economic Growth*, 1, pp. 363-389.

De Long, J. B. (2003), "India since Independence: An Analytical Growth Narrative", in D. Rodrik (ed.), *In Search of Prosperity: Analytical Narratives on Economic Growth*, Princeton: Princeton University Press.

Demurger, S., J. Sachs, W. Woo, S. Bao, G. Change and A. Mellinger (2002), 'Geography, economic policy and regional development in China' mimeo.

Dixit, A. and R. Pindyck (1994), *Investment under Uncertainty*, Princeton University Press, Princeton.

Doner, R. and B.R. Schneider (2000), "Business Associations and Economic Development: Why Some Associations Contribute More Than Others", *Business and Politics*, Vol. 2(3), pp. 261-288.

Hall, Robert and Charles I. Jones (1999) 'Why do some Countries Produce so much More Output Per Worker than Others?' *Quarterly Journal of Economics*, 114, pp. 83-116.

Harriss, John (2006) 'Institutions and State-Business Relations', London: Improving Institutions for Pro-Poor Growth (IPPG) Briefing Note 2, available at [www.ippg.org.uk/research](http://www.ippg.org.uk/research).

Heilig, G.K. (2006), 'Many Chinas? The Economic Diversity of China's Provinces', *Population and Development Review*, Vol. 32(1):147-161.

Ibarra, L.A. (1995), "Credibility of trade policy reform and investment: The Mexican experience", *Journal of Development Economics*, Vol. 47, pp. 39-60.

Islam, N. (1995), "Growth Empirics: A Panel Data Approach", *Quarterly Journal of Economics*, Vol. 110(4), pp. 1127-1170.

Kanbur, R. and X. Zhang (2005), "Fifty Years of Regional Inequality in China: A Journey Through Central Planning, Reform and Openness", *Review of Development Economics*, Vol. 9(1), pp. 87-106.

Kenny, C. and D. Williams (2001), "What do we know about economic growth? Or, why don't we know very much?", *World Development*, Vol. 29, No. 1, pp. 1-22.

Kiviet, J. F. (1995), "On bias, inconsistency, and efficiency of various estimators in dynamic panel data models", *Journal of Econometrics*, Vol. 68, pp. 53-78.

Kochanek, S. (1995), "The Transformation of Interest Politics in India", *Pacific Affairs*, Vol. 68(4), pp. 529-550.

Kochanek, S. (1996), "Liberalisation and Business Lobbying in India", *Journal of Commonwealth and Comparative Politics*, Vol. 34(3), pp. 155-173.

Kochhar, K., U. Kumar, R. Rajan, A. Subramanian and I. Tokatlidis (2006), "India's Pattern of Development: What Happened, What Follows", *Journal of Monetary Economics*, Vol. 53, No. 5, pp. 981-1019.

Kohli, A. (2006), "Politics of Economic Growth in India: 1980-2005", *Economic and Political Weekly*, April 1, pp. 1251 – 1259.

Kohli, A. (2007), "States, Business and Economic Growth in India", *Studies in Comparative International Development*, Vol. 42, pp. 87-114.

Krueger, A. O. (1974): The Political Economy of the Rent-Seeking Society, *American Economic Review*, Vol. 64, pp. 291-303.

Mankiw, N.G., D. Romer and D. Weil (1992), "A Contribution to the Empirics of Economic Growth", *Quarterly Journal of Economics*, Vol. 107, pp. 407-438.

Maxfield, S. and B.R. Schneider (1997), eds., *Business and the State in Developing Countries*, Cornell University Press, Ithaca.

Meschi, E. and M. Vivarelli (2009), "Trade and income inequality in developing countries", *World Development* Vol. 37(2): 287-302.

Mundle, S. and M.G. Rao (1997), 'Public Expenditure in India: Trends and Issues', in S. Mundle (ed.), *Public Finance: Policy Issues for India*, Delhi: Oxford University Press, pp. 224-258.

Nayyar, G. (2008), "Economic Growth and Regional Inequality in India", *Economic and Political Weekly*, February 9, pp. 58-67.

Ozler, B.; Datt, G., and Ravallion, M.(1996), A Database on Poverty and Growth in India, <http://www.worldbank.org/poverty/data/indiapaper.htm>.

Palmer-Jones, R. and Sen, K. (2003) 'What has Luck got to do with it? A Regional Analysis of Poverty and Agricultural Growth in India', *Journal of Development Studies*, Vol. 40(1), pp.1-32.

Pindyck, R.S. (1991), "Irreversibility, Uncertainty and Investment", *Journal of Economic Literature*, Vol. 29, pp. 1110-1148.

Planning Commission (2002), *Annual Report on the Working of State Electricity Boards and Electricity Departments*.

Purfield, C. (2006), "Mind the Gap- Is Economic Growth in India Leaving Some States Behind?" *IMF Working Paper*, WP/06/103.

Rodrik, D. (1991), "Policy uncertainty and private investment in developing countries", *Journal of Development Economics*, Vol. 36, pp. 229-243.

-- (2003) *In Search of Prosperity: Analytic Narratives on Economic Growth*. Princeton: Princeton University Press.

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*, 9, pp. 31-165.

Rodrik, D. and A. Subramanian (2004), "From Hindu Growth to Productivity Surge: The Myth of the Indian Growth Transition", NBER Working Paper No. W10376.

Sachs, J. (2003), 'Institutions Don't Rule: Direct Effects of Geography on Per Capita Income' NBER Working Paper 9490.

Sachs, J.D., Bajpai N. and Ramiah, A. (2002) 'Understanding Regional Economic Growth in India', Center for International Development at Harvard University Working Papers No. 88.

Saez, L. (2002), *Federalism without a Centre: The Impact of Political and Economic Reform on India's Federal System*, Sage, New Delhi.

Sala-i-Martin, X. (1996), "Regional cohesion: Evidence and theories of regional growth and convergence", *European Economic Review*, Vol. 40, pp. 1325-1352.

Sen, K., D.W. te Velde, S. Wiggins and M. Cali (2006), "Institutions and Pro-Poor Growth: Towards a Framework for Quantitative Analysis", IPPG Discussion Paper No. 2, available at [www.ippg.org.uk](http://www.ippg.org.uk).

Sen, K. and D.W. te Velde (2009), "State Business Relations and Economic Growth in Sub-Saharan Africa", *Journal of Development Studies*, forthcoming.

Sinha, A. (2003), "Rethinking the Developmental State Model: Divided Leviathan and Subnational Comparisons in India", *Comparative Politics*, Vol. 35(4), pp. 459-476.

Sinha, A. (2005), "Understanding the Rise and Transformation of Business Collective Action in India", *Business and Politics*, Vol. 7(2), pp. 1-33.

World Bank (2007), *India: Land Policies for Growth and Poverty Reduction*, Washington D.C.

World Bank (2009), *Doing Business in India 2009*, Washington D.C.