

**INSTITUTIONS, POLITICS AND THE SOFT BUDGET
CONSTRAINT IN A DECENTRALISED ECONOMY: THE CASE
OF INDIA**

by

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Institutions, Politics and the Soft Budget Constraint in a Decentralized Economy: The case of India

Abstract

This thesis tries to build a set of theoretical and empirical premises of the important issues pertaining to a decentralized government structure. While the questions that we attempt to answer in this thesis are varied, the common theme that runs through the essays is its focus on issues from a regional perspective. Our empirical outcomes are based on the Indian federal system, more specifically, the 15 major states of India, which account for over 90 per cent of the population and 95 per cent of GDP. The period under consideration is 1985 – 2000. We consider this to be a crucial period because a lot of stress in state finances emerged during this period. The research questions we broadly seek to answer are the following:

1. What are the causes of differences in developmental levels across the major Indian states?
2. What is the role of political alignment in determining the budgetary considerations of states?
3. What accounts for differences in human developmental outcomes across the states?
4. In normative terms, can it be argued that a decentralized structure need not automatically lead to the formation of a hard budget constraint? Further, can it be claimed that under certain circumstances, particularly when dealing with State-run natural monopolies, that a soft budget constraint may lead to better outcomes?

The starting point of our analysis or the first essay (Chapter 2) deals with the question as to why have Indian states had different levels of development and growth? The existing literature argues that states, which have followed better policies in terms of macroeconomic probity and identification of developmental issues, have had better

outcomes, which we feel is an inherently circular argument. The existing literature does not answer the basic issue of what prompted certain states to follow better policies? We add to the burgeoning literature on growth in Indian states, by looking at institutional quality. We argue that some states in India have better institutions than others, and these have set better policies. We suggest that the level of political accountability and the quantum of ‘point resources’ such as minerals would have an impact on the quality of institutions. The idea being that a region can be ‘cursed’ with high mineral wealth and having unaccountable politicians. This can lead the politician to try to subvert institutional quality in these regions to facilitate ‘rent seizing’, leading to lower developmental and growth prospects for such states. We try to prove this through a theoretical model as well as an empirical exercise.

The second essay (Chapter 3) is more empirical in its construct and analyses the impact of political affiliations and the quality of fiscal institutions on regional budget constraints. While we do not make any normative judgments here regarding the welfare implications of soft budgets, we argue that the correct political alignment and poor fiscal institutions might combine to lead a state to greater fiscal profligacy. This is because of the inability to have institutional checks on expenditures and due to a higher probability of an *ex post* bailout by the central government, through higher *ad hoc* transfers.

The third essay (Chapter 4) considers not merely ‘budgetary output’ levels such as the quantum of expenditures, in isolation, but looks at the ‘outcomes’ of such expenditures, viz. the impact of expenditure on health on an ‘outcome’ indicator like Infant Mortality Rates (IMR). across the major Indian states. We argue that analyzing the budgetary allocations on any expenditure tells us merely half the story. Since the Indian states are constitutionally required to spend more on human development

expenditures such as health and education as compared to the central government, the correct way to look at 'effective' expenditure would be to analyse the determinants of variation in 'outcome' indicators. We in our essay, consider variations in IMR to be our measure of 'outcomes'. We suggest that political accountability might have a major role in determining human developmental outcome levels through better utilization of expenditures.

Since we argued in the second essay that the potentially harmful impact of poor fiscal institutions and political alignment, is softening of the budget constraint, our final essay (Chapter 5) is a theoretical piece of work, which looks at the micro-foundations of a 'soft budget constraint' and tries to analyse the normative issue of the welfare considerations in this regard. We try to prove two concomitant factors in the federalism and soft budget literature. First, contrary to some of the existing literature, decentralization, need not automatically increase a commitment to the hard budget and second, in normative terms, under certain circumstances, a 'soft budget' is preferable to a 'hard budget'.

Declaration

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and beliefs, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

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Arnab Gupta, 18th October, 2004.

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Last, I would like to rephrase the oft-repeated quote that 'Success has many fathers but a failure is an orphan'. With respect to this body of work, I can honestly admit that many people would have contributed to its 'success', if any, however, the responsibility of any 'failure' must lie on my shoulders alone.

1. The Theory of Decentralisation in the Indian Context

1.1. Introduction

There has been an intense re-examination of the use and abuse of a federal structure of government in overall macroeconomic management. This has become more important in the context of a number of countries attempting an improvement in governance through better co-ordination for effective delivery of services, poverty alleviation, budget execution and administrative efficiency. The advantage of a federal system as compared to a centralised system is the argument that a decentralised government can more accurately judge the preferences of its citizens and would therefore be more efficient in the provision of public services.

On the question of macroeconomic governance however, there is much less agreement. Shah (1997) believes that ‘decentralised fiscal systems offer a greater potential for improved macroeconomic governance than centralised fiscal systems.’ Prud’homme (1994) on the other hand believes that decentralisation can lead to problems in macro economic stabilisation as sub-national governments have little incentive to undertake stabilisation policies. Despite the fact that conventional public finance (Musgrave (1959), Oates (1972)) argues that stabilization policies should be undertaken at a central level, the effect of sub-national policies on overall macroeconomic policies cannot be negated.

The Public finance literature in general accepts the Musgravian division of public functions into allocation, redistribution and stabilisation functions with its accompanying caveat that the first function ought to be assigned to the lower level governments while the other two ought to be in the domain of the central governments.

However, any research on regional governments must necessarily begin by focusing on the existing federal, institutional and political setup. It must be clarified at the onset that the research questions that this body of work attempts to answer, are broadly related to variations in development, political impact and welfare outcomes across the Indian states. This chapter begins by placing in context the theoretical underpinnings behind the concept of decentralisation in general, given that India has a federal structure of government, in section 1.2. Section 1.3 provides a general discussion of problems and prospects of a federal form of government. It then gives a brief overview of the Indian state level political, institutional and economic structures in Section 1.4, after which Section 1.5 discusses the trends in the Indian federal finance over the period 1985-2000. Finally, Section 1.7 identifies the specific research questions, which are addressed in the subsequent chapters.

1.2. Theoretical Perspectives on Decentralisation

Public Finance theory attempts to analyse the nature of government structure and following from that, the level of public activities with respect to resource generation, expenditure requirements and debt. The federalism literature begins by attempting to prove that a federal structure of government is ‘superior’ to a centralised government. Further extensions of the literature, accepts the superiority premise and then analyse the division of responsibilities among various levels of government and the effects of decentralisation on mobility, inter-jurisdictional spill-overs, equity, efficiency, intergovernmental transfers, taxation and debt.

A related aspect of the public finance theory is the political economy and formulation of macro-economic policies. Here too, the traditional theory studies an economy’s response to alternative government policies, rules and exogenous shocks.

The more recent literature has begun to focus on the incentives of government's decision making process. The emphasis is now on why a government chooses a certain set of policies. Further, it acknowledges that 'desirable policies' may suffer from lack of credibility due to the fact that policy decisions often change inter-temporally and thus a socially optimal policy might not emerge.

Theoretically, the study of public finance analyses governance – one important issue discussed by Breton (1965), Olson (1969) and Tullock (1969) concerns the optimal size of a government. Breton (1965) argues that a public good should not be seen as a homogenous entity, rather there exists various kinds of public goods, some of which are 'national' in nature while others may be 'local'. Thus there is an argument for an 'optimal constitution' which maps the benefits of a good to the level of government which provides it. If perfect mapping is achieved, then the financing of the good may be achieved through the 'benefit accrued' principle of taxation. If on the other hand, such perfect mapping is not achieved, as indeed in a real world it is unlikely to be, the solution for under-provisioning of public goods or services is government grants to enhance the supply of the public good in question. Breton's analysis highlights a key issue regarding the necessity of a higher or central governing body to compute the marginal social costs and utilities and thereby equalise them across regions through positive or negative grants.

Olson (1969) also attempts to analyse a system of government that would lead to pareto-optimal allocation of resources. He agrees with Breton's (1965) analysis in the sense that he argues that from the point of view of fiscal equivalence, an ideal solution would be to match the number of jurisdictions with the number of public goods, so long as there is a match between people benefiting from the public good and those paying for it. Olson (1969) identifies two cases under which pareto-optimal

allocation is not possible. First, where the public good spills over from its jurisdictional boundaries and the second where the public good does not fully encompass the jurisdiction it has been provided for. What Olsen argues is that there are 'systemic forces' which militate against allocative efficiency in case the boundary of a public good and jurisdiction do not coincide. This then is the argument for having a decentralised form of government. According to him it is the 'heterogeneity of tastes and preferences' that suggests a preference for decentralisation and that economies of scale reflects the need for relatively larger local governments for too large a size, generates diseconomies as well. Tullock (1969) argues in the same vein and suggests that the 'economies of scale' argument against decentralisation is not relevant if it is possible for a local government to purchase a public good from a specialised producer, for instance the central government, which might be reaping the benefits of scale economies. Thus so long as it is possible to separate the production of public goods from the provisioning of public goods, the economies of scale are no longer relevant. Tullock further argues for the need for citizens to have elected representatives, who would take over the function of monitoring the acquisition of those public goods desired by the citizens of a governable unit which best reflects their tastes and preferences.

The principle underlying the need for a federal system of governance stems from the perceived advantages of 'decentralization' but it remains to be determined whether decentralization really is a 'superior good' (Tanzi, 2000). The advantages of decentralization and by extension a federal structure lies in the fact that decentralization lowers the costs of 'signalling preferences, of moving between jurisdictions and of administration of governmental bodies' (Breton, 2000).

Sub-national governments do retain many characteristics of a central government; hence in certain cases it becomes difficult to ascertain the assignment issue on the basis of the Musgravian ‘trinity’ of functions. For instance it has been suggested by Pauly (1973) that when one considers immobility of populations across jurisdictions, there might be a greater role for the lower level governments in the aspect of redistribution. Similarly regional policies can play a limited role in managing unemployment and thereby have a role in stabilization (Gramlich, (1977)).

Thus it appears that the concept of assignment of resources and expenditures must be analysed in terms of ‘content’ rather than ‘form’. In this regard there have been a number of studies, which look at the assignment issue as a view towards management of spillovers. This theory assumes that a public good can be ordered hierarchically into local, regional, provincial, national and international public goods (Breton, 1965), thus by extension a perfect matching with benefits and jurisdiction size would need to have as many governmental levels as public goods for perfect ‘fiscal equivalence’ (Olson, 1969). Oates (1972) considers the ‘decentralization theorem’, which states that assuming no economies of scale, there is a cost advantage in having the lower level government units providing Pareto-efficient levels of public goods and services. This approach subsumes the efficient design of jurisdictional boundaries, which would in effect manage the spillovers efficiently. The problem with this approach is that it would require perfect knowledge about the level of spillovers in each jurisdictional hierarchy by a central authority, which would then demarcate the public good to be provided. Thus the division of functions can be done by an omniscient central government or an omniscient planner (Breton, 1996). A second approach to determining the assignment question can be seen from the angle of cost minimization (Breton and Scott, 1978). Simply put, this states that a

service/good should be decentralised so long as the welfare benefits achieved from decentralizing the provision exceeds the costs of decentralizing it. The third approach is one of 'competitive federalism', wherein different levels of government compete with each other to provide the public good at the least cost.

The traditional theory of federalism asserts that the federal structure and by extension 'decentralization' encourages competition, permits the non-uniform availability of goods to better match the public preferences as argued by Oates (1972). The benefit from decentralization has also been accepted by Breton and Scott (1978) when they suggest that decentralization minimizes organizational costs. The traditional theories also believe that government is benevolent and is willing to provide whatever the people want and are committed to preserving markets. However, this assumption becomes questionable, if there exists over dependence of the lower levels of government on the central government as this might lead to difficulties in economic stabilization.

From the welfare maximising point of view, the fiscal-federal literature concentrates on the welfare gains from diversified regional outputs. The gains emanate due to the perceived ability of the regional governments to enhance resource allocation in the public sector according to the tastes and desires of the regional population. Standard analysis, using the measure of consumer surplus associated with levels of public services as a measure of welfare, proves that there is a 'welfare loss' associated with the centralisation of a public service, in so much as it leads to 'over consumption' in one region and 'under consumption' in the other. The magnitude of the losses is contingent upon the variability of demand across regions and the price elasticity of the demands. This brings one to the issue of demand revelation for a public service. Tiebout (1956) analytically resolved this issue, when he suggested that

in a world where there existed different communities providing different levels of public services, an individual could select the level of public services he desired by taking up residence at the region of his choice, thereby ‘voting with his feet.’ In this way Tiebout suggested that an efficient outcome from decentralisation could be achieved. This result however could only be achieved under the assumptions of perfectly mobile consumers who move across regions costlessly without suffering a loss of income. The Tiebout model also has certain economic implications, one of which would be that there would be some form of concentration of a similar class of individuals in a region. Thus, this means that the regions in the economy would suffer from an implicit asymmetry in income across regions and therefore makes a case for intergovernmental grants.

In recent times a large body of literature has emerged suggesting a positive correlation between decentralisation and macro governance. Bahl (1999) argues that a closer association between resource mobilisation and expenditures may give rise to increased accountability on the part of governments. Qian and Roland (1998) suggest that competition along with decentralisation induces hard budget constraints¹ and thereby better governance since it increases the cost of government subsidies.

1.3. The Basis for Decentralised Governments

With the general disillusionment with centrally planned economies around the world, there has been a forceful argument towards decentralisation with a view to effective management of resources in an economy, cost minimisation and better distribution of public resources. Even in decentralised economies, there are wide

¹ We define ‘Hard Budget Constraint’ along the lines of Kornai (1980) where he suggests that a ‘Soft’ budget is defined as a syndrome where chronic loss making public sector undertakings are not allowed to fail and exit from the industry and are bailed out by government subsidies. This imposes a cost on society as it diverts scarce resources away from developmental activities. The absence of such a phenomenon may be termed a ‘Hard Budget Constraint’

variations in institutional factors such as political, social, legal, regional and of course economic. The quality of a decentralised economy also depends upon the maturity of the institutions, the formalisation of laws and policies and its adaptability to changes.

Despite these differences across decentralised economies, certain broad generalisations may be attempted regarding the finances of sub-national governments. First, for most sub-national governments, the expenditure responsibilities are greater than their resource assignments. This 'vertical imbalance' is redressed through resource transfers from the centre. Here again the transfers may be regular (formula based) or ad hoc (discretionary). The level of discretionary transfers that a sub-national government receives, determines the nature of the budget constraint for these governments. A second issue relates to the variations in size and resource capacity across sub-national governments within an economy. In a country like India, there exist substantial difference among regional governments. The government of India has designated certain low capacity regional governments as 'special category states' in order to provide a greater assistance to these regions. However, it must be borne in mind that such exercises carry with it the risk of moral hazard, where the sub-national government in question might be unwilling to put in the requisite effort to improve its resource capacity, as this would mean the loss of the 'special category' status. The third issue is that most of the sources, which generate revenue for sub-national governments, are not elastic enough and in some cases are not exploited adequately. Often the sub-national governments lack the opportunity, expertise, manpower or the political will to generate resources in line with its capacity, for itself, thereby increasing reliance on the central government over time.

The next related question, which stems from the preference for decentralised governments, is the relationship between economic growth and decentralisation.

Again, there are no simple answers, while the traditional literature has argued in favour of decentralisation. These include arguments regarding better delivery of public services, better accountability and quicker development from below. It is also argued that decentralisation broadens the tax base. However, there also exists the empirical evidence of many decentralised economies performing poorly. It has also been argued that decentralisation may aggravate fiscal problems due to the reduced efficacy of monetary and fiscal policies in managing the spill-over effects of sub-national policies. Besides, there exists the problem of designing an effective decentralisation policy.

The macroeconomic instability in decentralised systems can arise from a variety of reasons. For instance, the effect of sub-national borrowings might impinge on the effectiveness of monetary policy and thus on the economy as a whole. Similarly, the lower tier governments can engage in 'non-cooperative' behaviour if they realise that they are 'too big to fail' and this might lead to fiscal profligacy on part of the lower tier governments. Similarly, if the central government itself is fiscally imprudent, it might find it difficult to demand prudence from the states, leading to a further vicious cycle of debt and deficits.

Thus it has to be recognised that decentralisation alone cannot promote fiscal prudence, nor can it be considered responsible for macro economic instability. Decentralisation has to be seen in conjunction with certain implementation rules (Bahl, 1999) and only then can decentralisation be realised as a complete and effective policy strategy. Bahl (1999) argues that fiscal decentralisation must be viewed as a comprehensive and organic system having legislative, financial and judicial components. It must include elected local bodies, a strong local government with revenue raising powers and with expenditure responsibilities. It must have

budget autonomy, budgetary transactions must be transparent and it must have an effective hard budget constraint. Apart from this, it is 'desirable' that the regional government has freedom to allocate its expenditures, has access to untied grants from the centre and has powers to borrow from the market. Other rules which ought to be implemented for a decentralised system to function is that expenditure assignment ought to precede revenue assignment, there must exist good monitoring and evaluation capability by the centre, the decentralised structure ought to be flexible enough to accommodate rural and urban sectors, the central government must lead by example, there must exist a good and transparent system of intergovernmental transfers and governments must impose a hard budget constraint.

It is highly probable that very few governments would be able to strictly enforce all the rules enumerated above. The problem is further compounded by the fact that a number of these rules are intertwined and a failure to maintain anyone might create a 'domino effect' upon the other rules, making a properly functioning decentralised system that much more difficult to achieve.

Thus given that the degree of decentralisation varies across economies, there is need to focus on the major features of an intergovernmental fiscal system. Very broadly, these pertain to – expenditure assignment, revenues, inter-government transfers and sub-national debt.

1.3.1. Expenditure Assignments

It has been generally argued and accepted that clear expenditure responsibilities is essential for a well-designed inter-governmental fiscal system. This argument stems from the 'benefit principle', which suggests that at a micro level, a certain expenditure must be borne by that level of government which is best

representative of the region that benefits from the expenditure. Thus local public services and user charges for water and electricity should be under the purview of the regional government while expenditures like national defence should be borne by the central government. Without proper earmarking of expenditures there would be complications in identifying potential avenues for revenue, long-term objectives of the regional governments and prioritisation of projects. However, there exists the problem of precisely identifying which public good is best provided by a certain tier of government, as there might exist efficiency spill-overs at any level of government. Simply put, expenditure assignment should be done on the basis of efficiency, such that economies of scale are realised, the services provided are competitive and are priced appropriately. A second aspect of expenditure assignment pertains to fiscal equity, which suggests that to the extent possible expenditures ought to be assigned to regions on the basis that it generates economic externalities and the region has adequate fiscal capacity to finance their expenditures. A third issue pertains to political accountability, which suggests that expenditures should be assigned to government tiers in such a way that the residents can monitor their performance and maximise resident participation. The final issue concerns administrative effectiveness, which maintains that expenditure assignment should be attempted in a way that ensures that the administrators would have the capability to effectively provide the services, have their performance in providing the services effectively monitored and have the required authority to discharge their functions.

The analysis of expenditure responsibilities across tiers of government is further complicated by the multiplicity of objectives of the various tiers of government, which might contradict each other. A lower level government is not immune to fiscal decisions at the higher tiers, which might have bearing on the public

services provided. It is noticed that the decentralised developed nations typically perform better than the corresponding developing nations. This is primarily because these nations have had the time and the opportunity to evolve into functional federal economies. These developed economies have managed to tailor their federal systems to be relatively more fiscally and administratively superior. Most of the developing economies, including India, have had a history of strong centralised systems, thus effective federal governance is yet to be achieved.

1.3.2. Revenues

The next key issue in the context of sub-national fiscal relations is the financing of government expenditure. Theoretically resources may be assigned in three possible ways. First, all resources may be assigned at the regional level, with the regions required to transfer a part of their collections to the centre. Alternately, all resources may be assigned at the central level and the centre would redistribute the resources to the regions. The third option entails assigning certain taxation powers at the regional level, which is then augmented through further transfers from the centre if necessary. Decentralisation necessarily entails the ability of the lower tier governments to undertake its own expenditures and the availability of own resources. It might be the case that there exists a vertical imbalance in the assignment of resources, however this may be mitigated through transfers. The important issue is the authority to raise revenue at the regional level, which is expected to increase the tax base of an economy. In general the tax bases assigned at the sub-national level should be relatively immobile across sub-national boundaries, the taxes which are mobile ought to be collected by the centre and redistributed at the regional level. The public services provided at the regional level ought to be financed as much as possible

through user charges, though some services that generate substantial externality, may be subsidised. The major issues in resource generation that matter to sub-national governments are those of tax administration and collection. With multiple state governments, there is also need for a level of co-ordination among the regional governments before deciding the tax rates, because it might lead to a ‘race to the bottom’ with each regional government setting lower tax rates in the hope of attracting investment and thereby losing revenue.

1.3.3. *Inter-Governmental Transfers*

As enumerated earlier, federal systems can have endemic vertical and horizontal imbalances, owing to mismatches in expenditure responsibilities and resource assignments. The vertical imbalance is concerned with the distribution of revenues between the central and regional units, while the horizontal imbalances arise out of revenue mismatches among the regional units. A horizontal imbalance typically occurs when the sub-national governments are endowed with different fiscal capacities.

A vertical fiscal gap, gives rise to the argument for inter-governmental transfers. This is also the key area where any discussion on soft-budget constraint would have to be based. The size of the vertical gap can be taken to be a function of a sub-national government’s policy choice and constitutional requirements. Typically certain federal governments (like USA) require that the sub-national governments budget should be balanced *ex ante*, while others (like India) allows for an *ex ante* budget deficit. Thus, there exists in the case of the latter type of federal systems, the incentive to increase expenditures, without having the concomitant revenues. In such situations, it is likely that the vertical gap would be accentuated. A sub-national

government would be more likely in persisting with a deficit, if it perceived that the inter-governmental grants provided by the centre followed a ‘gap filling approach’. It is also obvious that even if it was constitutionally required, that governments present a balanced budget – the sub-national governments could achieve an ex-post *fait accompli* by presenting a deficit budget. The issue here thus resolves into one of credibility. If the regional governments feel that they would be eventually bailed out by the central government despite threats to the contrary, there is incentive for the sub-national government to make little or no attempt to close the vertical gap.

The horizontal imbalances that occur due to differences in ‘fiscal capacity’ across regions may be redressed through equalisation transfers. Theoretically, this is defined as the amount of transfers to the sub-national governments such that they are able to provide the same level of public services. This of course requires a regular review and a methodology for calculating fiscal capacities.

Transfer of resources may be in the form of shareable taxes, grants and loans. While loans have an interest burden and need to be repaid, in the literature one can consider the ‘current transfers’ comprising taxes and grants for financing revenue expenditures. The taxes may be transferred on the basis of a shared base or redistributed out of a common pool. Grants too may be of various kinds – conditional or unconditional, matched-unmatched, open or closed.

1.3.4. Sub-National Borrowing

The rising public debt and its implications for the economy as a whole has received a lot of attention in policy making. A sustained rise in debt-GDP ratio is usually reflected in higher interest rates, deficits along with rigidities in macro-economic management. The increased debt means that a larger share of resources is

appropriated for non-developmental but committed expenditures like interest payments. This leads to lesser manoeuvrability in terms of options available for macro-management. There appears to be a trade-off between increased federal autonomy and potential debt management issues, in the sense that allowing sub-national governments to borrow from the market, while desirable for a functioning federal structure, brings with it the risk of enhanced debt.

Sub-national borrowing is an important policy option, if it is used for financing long-term investment projects, such that the residents who consume the services of the project also have to pay for it in terms of interest payments. Borrowings used to finance long-term projects have the positive effect of providing stimulus to current development.

The sub-national governments have access to borrowings from varying sources. Some countries like Canada, have complete freedom to borrow from the private capital markets, others like India, make the greater proportion of their borrowings from the government or public financial institutions and only a part of it from the domestic market and still others like China, are prohibited from borrowing at all. The problem with sub-national borrowings arise in case they are guaranteed against default by the central government. This provides perverse incentives to the regional governments to borrow excessively.

A further issue pertains to the federal structure that allows multiple units to borrow from the market. Theoretically, if the central government has the ultimate responsibility of repaying all domestic debt, then it would find the overall coordination of debt management difficult, if there were multiple borrowing units. Second, if the threat of no-bailout in case of a default is not credible, there is no

incentive for the state not to resort to excess borrowing. This ‘fiscal myopia’ might lead to difficulties in the stabilisation function of the central government.

We now turn to the Indian state level institutional, political and economic framework.

1.4. The Indian Federal System and Institutions

The Indian federal system is complex and is enmeshed in a variety of laws, rules and institutions. This is a reflection of the economic and infrastructural disparities across regions as well as the vertical imbalance between the expenditure assignment and the revenue raising capabilities of the centre and the states. Apart from a state’s own revenues, its resources are augmented by transfers from the centre, which includes – shareable taxes, grants and loans. Apart from these a state has recourse to borrowings from the market, ways and means advances from the Reserve Bank of India and the centre as well as ad hoc transfers.

The Indian federal system was formally established in 1919 when the Government of India Act formally separated the central and provincial revenue sources, which curiously enough resulted in central government deficits, which were bridged by transfers from the provinces. The present Indian fiscal structure has its origins in the Government of India Act 1935 and the Indian Constitution (1950). In between 1935 to 1947 there were increasing proposals towards a looser federal structure. However, with the independence and partition of the country in 1947, the administrative structure of India changed in the sense that while it retained a federal form, there was increasing concentration of powers at the central level². The

² This was also necessitated by the absorption of over 500 erstwhile ‘Princely States’ into the Indian Union using the Instrument of Accession.

constitution of India was framed with the objective of having a strong centre while preserving the federal form of the Indian Government.

The Indian federal structure clearly demarcates the revenue and expenditure powers among the various tiers of the government. The country is currently divided into twenty-eight states and seven union territories³. The centre-state financial relations as envisaged in the constitution, has to be seen in the wider context of administrative and legislative relations as well as planning and development in terms of centre-state relationship. The legislative relations between the centre and state are enumerated in chapter I part – XI (Articles 245-255) of the Indian Constitution. This underscores the subordinate status of the state governments vis-à-vis the central government. The seventh schedule of the constitution demarcates the legislative, executive, judicial and financial powers of the Centre and the states in terms of the union list, the state list and the concurrent list. The constitution also vests all residual powers with the centre; it also vests with the centre the power to over-ride the decisions of the state governments. Similarly the administrative powers (Articles 256, 257 and 258) detailed in the constitution also provides the central government the power to give directions to the states, to delegate powers to the states and provide grants to the states. Article 293 of the constitution which provides that states which are already indebted to the centre require its consent for additional borrowings further corroborates this view.

The financial aspect of federal relations is one of the most contentious aspects of a decentralised system of government. Part XII of the Indian Constitution describes the distribution of revenues between the Centre and the States and delineates the taxation powers of the Centre and the States. In the Indian federal system, the Union

³ Up until 2000, the Indian union consisted of 25 states and 7 union territories. From 2001, 3 new states were created taking their number to 28. We confine our subsequent analysis to the 15 major states of India, which account for over 90 per cent of the population and 95 per cent of the GDP.

list incorporates 12 items of taxation, while the state list has 19 items of revenue. Crucially, there exists no taxable item in the concurrent list, which means that the taxes of the centre and states are completely separable. All residual powers of taxation are retained with the centre. It is also accepted that the central government has under its ambit, the more elastic taxes, while the States have been given the more inelastic taxes. In order to mitigate the imbalance between the expenditure obligations of the state and their resource generating capacity, the constitution has prescribed certain obligations on the part of the central government. These include – obligatory sharing of union taxes on income (Article 270), sharing of union excise duties (Article 272), assignment of certain union taxes and duties entirely to the states (Article 269) and providing financial assistance to the states in the form of loans and grants (Article 275).

Apart from this, the constitution provides (Article 280) that the central government appoint a Finance Commission every five years to (a) make recommendations regarding the distribution between the union and the states the net proceeds of taxes and their allocation among states, (b) the principles which should govern the grants-in-aid to be provided to the states and (c) any other matter referred to the Commission in the interest of sound finance. Since the adoption of the constitution, twelve Finance Commissions have so far been set up.

The Constitution of India lists “economic and social planning” in the concurrent list of jurisdiction, and consequently an extra-constitutional authority called the Planning Commission has been created in order to take a holistic approach to the development aspects of the entire nation. It is expected that the Commission works in close co-ordination with the Finance Ministries of the central and state governments and prepares draft ‘Five Year Plans’. The Nodal body for planning is the

National Development Council (NDC) under the chairmanship of the Prime Minister of India and includes the Chief Ministers of all state governments, Union Cabinet Ministers and Members of the Planning Commission.

The fact that the state governments in the Indian federal systems have had to traditionally function under the ‘benign eye’ of the central government tends one to infer that the sub-national finances of India would not be allowed to become a cause for economic concern. Yet, it is a fact that the combined deficits of state governments in India equal that of the central government and the debt-GDP ratio, though lower than the central government, reveals a rising trend⁴. The factors which must be considered when fixing responsibility for the fiscal imbalance has to be a combination of a deficit bias by the governments owing to ‘populist’ government policies and the lack of a credible threat by the central government to the lower tiers for prudent financial management leading to softening of the budget constraint. A further issue is that the deficits and increased debts of the state governments emerged since the latter half of the 1980s and were further accentuated in the 1990s, the period when the central government was embarking upon its fiscal reform programme with increased decentralisation. This needs to be placed in context of the assertion that decentralisation leads to hardening of the budget constraints.

The political aspects of a federal setup has also to be taken into consideration in any meaningful analysis of sub-national governments, because every fiscal institution and fiscal incentive might fail to provide the correct environment for prudent fiscal management without the ‘credible’ backing of the political institutions. Similarly, the nature of political accountability and its consequent impact on development and social attainment levels must also be considered.

⁴ Reserve Bank of India’s ‘Report on Finances of State Governments’ (various issues)

The Indian constitution fosters an asymmetric division of powers and responsibilities between the various levels of government. The central government has far greater revenue raising powers than the regional governments, while the latter have been entrusted with an increased role in providing delivery of services.

The institutional arrangements appeared to have stood the country in good stead through out the decades of 1950s, 1960s, 1970s up to the second half of 1980s, the time through which the states more often than not had a surplus revenue account or a reasonably small deficit. It was only since the latter half of the 1980s that the consolidated accounts of state governments showed continuous and rising revenue deficits. It has been suggested by McCarten (2003) that the stability of Indian state finances prior to the nineties was due to the over arching influence of the central government on state fiscal decisions in the form of planning, transfers, interest rate controls and harmonized policy objectives which ‘nurtured a political culture of dependence at the state level’. With the liberalization in the 1990s, this link between the Centre and the states weakened to a certain extent, wherein states were given the autonomy to prioritize their economic policies. The market driven competition for attracting private investment along with non-repressed interest rates and the sluggishness by the states in curtailing non-essential expenditures led to the weakening of state finances.

The political system in India, is a parliamentary democracy, and since India has a federal structure, there exists a Central legislature and state level legislatures. Currently the National legislature has 543 parliamentarians. The Indian political system accommodates a significant number of political parties. The Election

Commission divides them into National Parties and State parties⁵ depending on length of political activity and success in elections. Typically a National Party would be expected to have a presence in at least five or more states. The State parties are usually expected to be a major force in one particular State. It is usually the case that a National Party forms a coalition with a regional party in order to contest elections at the Central and State levels. The size of the state legislatures vary depending on the state population, thus in the case of India currently, the largest state legislature is that of Uttar Pradesh (425), while the smaller north-eastern states like Nagaland has a state assembly of 60 legislatures.

1.5. Trends in Indian Federal Finance

1.5.1. Expenditure Assignment in the Indian Federal System

Expenditure decentralization in India has occurred to a substantial degree with almost two-thirds of the government expenditures being undertaken at the lower tier of government. The problem on the expenditure front stems not from the quantum of expenditures required to be undertaken at the lower levels, but the nature of expenditures. The problem that the Indian states have been facing has been the rising non-developmental expenditures – led primarily by interest payments, wages and salaries and pensions. The non-developmental expenditures absorbed over 35 per cent of the total expenditures in 1999-2000 as compared to 21.4 per cent in 1985-86. The rising magnitude of non-developmental expenditures is symptomatic of the growing imbalance in resource allocation, led mainly due to the rise in maintenance outlays of assets created in successive five year plans as well as the rising administrative costs and debt servicing (Table 1.1).

⁵ They also have a third tier of registered/unregistered parties, which includes the very small regional parties, which have a presence in a few constituencies.

Table 1.1: Indicators of Expenditures of Indian States

Year	Agg. Expd/ GDP	Rev. Expd/ Agg. Expd	Int. Pay/ Rev. Recpt.	Non Dev. Exp Agg. Expd.	Cap. Expd/ Agg Expd.	Debt/ GDP
1985-86	16.1	73.0	8.8	21.4	27.0	19.3
1990-91	16.0	78.8	10.8	24.8	21.2	19.4
1995-96	14.9	81.7	16.0	31.2	18.3	17.9
1999-2000	16.2	83.1	21.8	35.1	16.9	21.7

Notes: GDP at current prices, base 1993-94. Debt Refers to Outstanding Liabilities of the State

Data pertain to all the State Governments.

Key: Agg. Expd: Total Expenditure, Rev. Expd: Revenue Expenditure, Int. Pay: Interest Payments

Non Dev. Exp: Non Developmental Expenditure, Cap. Expd: Capital Expenditure, Rev. Recpt.: Revenue Receipt

Source: RBI Report on Finances of State Governments (Various Issues)

The analysis of State expenditures throw up certain facts, first of all is the issue that expenditure containment at the State level has not been successful, the growth rate of revenue expenditure of the States during the period 1985-2000 has been 16.0, as compared to a growth of revenue receipts of 14.0 per cent during the same period. The share of revenue expenditures in total expenditures has also increased from 73.0 in 1985-86 to 83.1 in 1999-2000. The fact that the level of liabilities of states and the need for servicing these debts have also risen significantly during the period has contributed to the skewed pattern of expenditures. The low threshold of revenue receipts led to increasing amount of borrowed funds to be used for current expenditures leading to the vicious cycle of higher borrowings leading to increased interest payments leading to still higher expenditures.

The problem with such expenditures is that it does not contribute to the creation of new assets. The low productivity of investment expenditures also exacerbated the fiscal health of the Indian States. Political expediency led to the mushrooming of social and economic endeavors with inadequate resource allocation, leading to cost and time over-runs.

A key feature, which has affected the finances of regional governments in India, has been the revision of pay scales and pensions of government employees in 1994-95. The impact on States was far more severe than at the Central level, because the share of salary and pensions related expenditures at the State level is higher. This burden was sought to be mitigated by the States through cutbacks in investment and social service expenditures. This is evidenced by analyzing the consolidated capital expenditure to GDP ratio of the States, which was 4.4 per cent in 1985-86, declined to 2.7 per cent in 1999-2000.

A further issue that leads to the proliferation of expenditures as highlighted by Rao (2002) pertains to an aspect of budget formulation, where a distinction is made between 'plan' and 'non-plan' expenditure, which according to him is 'artificial and often meaningless', since they are often misleading as a 'plan' expenditure is purported to be productive and a 'non-plan' expenditure unproductive. The lines between plan and non-plan expenditures are now blurred because often salary payments for a plan project are classified as a plan expenditure, which cannot be designated as productive. There is emphasis on the State budgets for increasing the 'plan' size every year irrespective of resource position. This has led to making expenditures increasingly unwieldy.

The equity-efficiency trade off has led to the problem of cost recovery in government services in India. For the States a large part of the fiscal problem has stemmed from meeting the demand of critical public services like electricity, water, public health, education, transportation etc. However these expenditures have not been accompanied by a 'reasonable' amount of collection of costs in providing these services. The need for equity compromises on the efficiency of delivery of these

services, primarily done by public sector undertakings leading to the issue of a soft budget constraint.

1.5.2. Revenue Assignment in India

The trends in revenue receipts of Centre and states show that on an average the Centre collects approximately two-thirds and the states one-third of the total revenue collections of the government. Of this, the tax revenue share (after devolution) has changed from being almost equal for Centre (49.0 per cent) and States (51.0 per cent) in 1985-86 to 45.5 percent and 54.5 per cent for Centre and States in the mid-1990s, respectively, showing a progressively higher level of decentralization over time.

The analysis of trends in tax receipts over the period 1980 to 2000 shows that growth of taxes has registered a deceleration. The major regional taxes like stamp and registration, which grew by 16.7 per cent during the decade of the eighties (1980-90) decelerated to 15.9 per cent during the nineties (1990-2000). The most buoyant of the regional taxes – the Sales Tax also showed a similar trend, decelerating from 15.3 per cent to 13.4 per cent during the same period. The reason for the relative stagnancy in tax receipts at the regional level can be ascribed to a number of factors. First, despite the arguments of equity and the need for expansion of tax base, tax on agricultural income has not been levied in India, due to political lobbying. This has led to avenues for tax evasion or tax avoidance. A second reason for the low growth of regional taxes is the non-inclusion of the services sector within the ambit of taxation. Acharya (2002) suggests that during the 1990s the services sector grew by 7.8 per cent as against the 2.8 per cent and 5.7 per cent growth in the primary and secondary sectors respectively. The states are currently allowed to levy taxes only on goods; hence services remain outside the tax net leading to the lack of buoyancy in tax growth.

The other source of revenue for the regional governments is the resources raised through provision of public utilities or the 'non-tax revenues'. The state governments in India are expected to earn returns on providing public utilities like water, electricity, health, education, however, the returns on investment in such utilities have not been forthcoming. Rao (2001) suggests that 85 per cent of the total investment of State level public enterprises is on electricity utilities, which have been facing substantial losses by not even generating the low return of 3 per cent on fixed investments as proposed by the Electricity (Supply) Act of 1948. The fixed assets of the state electricity boards (SEBs) were Rs 6,80,000 million and by 1999-2000 they had a combined commercial loss of Rs 2,30,000 million. The reasons for such malaise are mainly due to poor efficiency levels leading to high transmission and distribution losses (23.7 per cent), and political expediency in keeping electricity rates low and even leading to the provision of free electricity to certain sections of society.

Table 1.2: Indicators of Revenues of Indian States (including Central Transfers)

Year	Gross Trn/ Rev. Recpt.	Tax Rev./ Agg. Recpt.	Sales Tax/ Rev. Recpt.	SOR/ Agg. Expd.	Tax/ GDP	Non-Tax/ GDP
1985-86	65.7	46.8	25.2	44.2	7.8	4.2
1990-91	61.5	48.9	26.6	43.5	7.8	3.8
1995-96	50.9	51.5	25.9	48.9	7.8	3.7
1999-2000	46.5	47.2	30.1	42.2	7.6	3.1

Notes: GDP at current prices, base 1993-94.

Data pertain to all the State Governments.

Gross Transfers in 1999-2000, excludes statutory transfers from National Small Savings Fund (NSSF).

Key: Agg. Expd: Total Expenditure, Rev. Expd: Revenue Expenditure, Int. Pay: Interest Payments

Non Dev. Exp: Non Developmental Expenditure, Cap. Expd: Capital Expenditure, Rev. Recpt.: Revenue Receipt

Source: RBI Report on Finances of State Governments (Various Issues)

1.5.3. Inter-Governmental Transfers in India

The system of intergovernmental transfers has been designed theoretically to mitigate vertical and horizontal resource inequalities. Despite the stated objectives of transfers Rao and Singh (1998) report an ‘increasing trend in vertical fiscal imbalance’ meaning that the state governments were becoming increasingly less able to finance their expenditures through own resources.

There has been overtime an increasing reliance on other sources of resource acquisition by the states, as is witnessed by the declining ability of states to finance their expenditures from own resource, which has declined from 44 per cent in 1985-86 to around 42 percent in the 1999-2000. This has been primarily due to the unwillingness of most states to consider all sources of taxation (of agriculture for instance) available to it. Concomitantly there has been a substantial increase in the size of government overtime which has added to state expenditures.

At the same time transfers as a proportion of GDP has shown a declining trend from around 7.9 per cent in 1985-86 to 5.0 percent in 1999-2000. With share of taxes and non-tax revenue as a proportion of GDP remaining constant, the fiscal stress for states has obviously risen. This is reflected in the rising debt-GDP ratio of the states as they increasingly rely on ‘other’ sources like loans from financial institutions, provident funds etc. to finance their expenditures.

The problem of designing transfers in a diverse country as India is extremely challenging, since one has to keep in mind certain ‘endowment’ factors which require the less blessed states to have different parameters for fund transfers. It has also been argued that given the multiple sources of transfers, the design of transfers is often faulty, in the sense that at times it appears to reward fiscal imprudence. Similarly a related argument in the political economy framework, suggests that overtime there has

been an increase in the discretionary element of transfers. This seems to suggest that there might exist some implicit bargaining at the political level in India, where increasingly national level parties are becoming allied with regional parties for electoral purpose. This issue is explored in depth later in this thesis

1.5.4. Debt and Contingent Liabilities of State Governments

The increasing reliance on borrowings by the States, have led to a serious erosion in the States' capacity for fiscal management. This has been reflected in the major indicators of debt sustainability. During the nineties the debt of all States grew at an average of 18.6 per cent⁶. The debt GDP ratio, which was around 19.3 per cent in 1985-86, was estimated at around 21.7 per cent by 1999-2000. Apart from this, there has been the rise in the average cost of borrowings for the States. The average interest rates was 9.75 per cent in 1985-86, it rose to 11.89 per cent by 1999-2000. This has led to a concomitant rise in the debt burden of States, with interest payments absorbing 8.8 per cent of revenue receipts in 1985-86 as against 21.8 per cent in 1999-2000 (Table 1.1). This has affected resource availability for productive investment in social and economic sectors as is evidenced by the declining share of developmental expenditures. The growth in State Governments' debt also assumes significance because the States tend to depend heavily on the Centre for their borrowings. Thus loans from the Central Government account for almost half of the total borrowings of the States. Such a high fiscal dependency has over the years has compounded issues of soft budget constraints for the State Governments. States often demand debt relief in the form of debt write offs, extension of maturity periods and lowering of interest rates. This unfortunately acts as a disincentive to prudent debt management as it

⁶ State Finances – A Study of Budgets 1999-2000, Reserve Bank of India

provides only transient relief to the States rather than a long-term solution to the debt problems of the sub-national governments.

In addition to the high stock of public liabilities, contingent liabilities or guarantees extended by the State Governments have started to have an important bearing on State Finances. While the problem is not yet critical, it must be understood that a cavalier attitude towards extending guarantees without proper risk assessment, can have serious consequences for the government finances in the event of a default.

1.5.5. Human Development Expenditures and Outcomes in States

The goal of any welfare maximizing government is to improve the quality of life of its citizens. In India too, recently there has been an effort to assess the level and quality of human development expenditures. It has been argued that public provision of social services like health and expenditure helps in promoting equity. Whether high social sector expenditure helps in social sector attainments, is still open to question, a quick overview appears to suggest that there is wide variation in education and health outcomes. Table 1.3 indicates, that the education expenditure to GDP ratio of the states has been about 3.0 per cent⁷, as compared to an average of 5 per cent of GDP for developed states. It is however, in health expenditures that the states perform exceedingly poorly, compared to their developed counterparts. The public health-GDP expenditure is only around 1 per cent, as compared to over 7 per cent for the developed countries.

Even as a share of aggregate expenditures, education (16 per cent) and health (4.5 per cent) expenditures have remained static. There are inter-state variations in expenditure levels, but it is in the outcome levels where the variations are far more

⁷ It must be noted that education is in the 'concurrent list' of the constitution, indicating joint responsibility of the Central and State Government. Including the Centre's contribution pushes the expenditure-GDP ratio to about 4 per cent. Health, on the other hand is purely a state subject.

significant. Analysing the literacy levels on an all India basis, we find that literacy rates have increased from 44 per cent in 1981 to 52 per cent in 1991 and 65 per cent in 2001. However, in terms of state level variation, it is observed that the state of Kerala had 90 per cent literacy in 1991 as compared to 38 per cent for Bihar in the same period. Similarly for infant mortality levels, Kerala had an infant mortality rate of 42 per 1000 live births in 1991, as compared with 133 for Madhya Pradesh in the same period.

There is also the need to mention cost recovery from public services provided on health and education. Given the high level of subsidy provided, it really comes as no surprise that the State does not recover even the costs of running the institutions. A study done by Kaur and Misra (2003) estimate the recovery from health and education sectors to be between 2 –3 per cent. It is still questionable, whether the public expenditure reaches the targeted population, despite the high levels of subsidy. This view has been argued by the World Development Report (2004) which claims that “services fail the poor” because they are dysfunctional, of low technical quality and are not responsive to the intended clients. These are some of the issues addressed in the thesis.

Table 1.3: Indicators of Social Sector of Indian States

Year	S. Sec. Ex/ GDP	Educ. Ex./ GDP	Hlth. Ex./ GDP	Educ. Ex./ Agg. Expd.	Hlth. Ex./ Agg. Expd.	Rur. Dev./ Agg. Expd.
1985-86	5.2	2.5	1.0	15.4	6.2	5.0
1990-91	5.3	2.8	0.7	17.4	4.6	5.3
1995-96	4.9	2.5	0.6	16.5	4.0	3.8
1999-2000	5.3	2.9	0.8	18.0	4.8	3.5

Notes: GDP at current prices, base 1993-94.

Data pertain to all the State Governments.

Key: S. Sec. Ex : Social Sector Expenditure, Educ. Ex: Education Expenditure, Agg. Expd.: Aggregate Expenditure

Hlth. Ex.: Health Expenditure, Rur. Dev.: Rural Development Expenditure

Source: RBI Report on Finances of State Government (Various Issues)

1.6. Factors that Impact Indian State Level Development

In light of the above discussion, it is imperative to crystallize those issues that to our mind have a critical impact on the development of regions in India. The first is what we believe is a critical component of any research question on regional development in India. This refers to the variation in development across regions in India. It has been pointed out in a number of earlier studies on the growing divide between the ‘good’ and ‘bad’ states in India. It also suggests that the poor institutional quality in regions across India ensure that developmental outcomes are extremely skewed against the poorer and marginalized sections of society, who ‘lack the leverage to ensure that state institutions serve them fairly’ (World Bank Report (2003) ‘India: Sustaining Reform, Reducing Poverty’). The key conclusion drawn from most studies on Indian regional reforms, appears to point to the ‘policy beneficiaries’, where the argument runs along the lines that the good states are those which adopted better policies. However, we feel that the process of explaining developmental variations would be better served if one could explain the initial causes which leads a state to set better policies for her citizens. We suggest that the answer lies in political competition and institutional quality.

Another issue that is of crucial importance is to explore in greater detail the political impact of the superior fiscal powers of the Centre over the states. This too has two aspects, first, is the quality of fiscal management across states in India and second is the ‘political’ dimension in federal transfers, given the financial asymmetry between the Centre and the States. We believe that it is the quality of budgetary institutions or policy formulations, which would impact upon the fiscal stance of state budgets. The other factor that would have a bearing would be the level of ‘discretionary transfers’ that a State might receive for political reasons.

The aspects that we have been discussing in this section so far are in a sense concerned with ‘output indicators’. In other words, these factors look at the major macro-budgetary variables of revenues, deficits, transfers and allocations. What is missing from this is the premise of ‘outcome indicators’. In other words, by merely focusing on the financial and budgetary aspects of government finances, we do not get a flavor of what is it that would affect certain developmental indicators of states. This becomes extremely relevant in the Indian context, given the large variation in human developmental indicators across different states. Considering the fact that all the states are entities within a single federal structure, one might argue that the ‘initial conditions’ of all the states would be broadly similar. Thus there might be certain endogenous factors, which account for variations in developmental outcomes across States. In a democratic country like India, the level of ‘political competition’ might have a role in explaining the quantum as well as the quality of expenditures on human development.

A final issue pertains to the on going debate on the financial leakages that are being endured by the State Governments due to the existence of soft budget constraints. It is indisputable that in a perfect world a hard budget will always give rise to better outcomes than a soft budget. However, recent international experience has shown that a number of countries have bailed out firms that were facing financial downturns. Thus, a similar bailout system existing for public sector firms in India is understandable even if it isn’t acceptable. The basic premises of the literature on soft budgets, and the federal structure make two assertions – first, that a decentralised structure of administration can increase the ‘commitment’ to a hard budget by a government, and implicit in this, is the argument that a ‘hard budget’ is preferred to a soft budget. However, this does not explain the fact that even capitalist countries (as

opposed to Kornai's Socialist country example), like France, U.K and Australia, have bailed out private firms on occasions. Some might argue, that these are purely 'political factors' getting the better of economic rationality, and can thus be explained through a 'political economy' model. We however, wish to explore whether there are any 'economic' arguments for preferring a soft budget on certain occasions. Second, given the Indian experience, where a large number of state-level public sector undertakings are frequently bailed out by the government, there is reason to be skeptical of the assertion that decentralization hardens the budget constraint. It will be our endeavor to prove that under certain circumstances, a decentralised form of government will have a higher propensity to soften the budget.

1.7. Thesis Structure

Thus in our thesis we will try and analyse four different facets that might have an impact on regional budgets and regional developmental outcomes. The starting point of our analysis or the first essay (Chapter 2) deals with the question as to why have Indian states had different levels of development and growth? The existing literature argues that states, which have followed better policies, have had better outcomes, which we feel is an inherently circular argument. The existing literature does not answer the basic issue of what prompted certain states to follow better policies? We add to the burgeoning literature on growth in Indian states, by looking at institutional quality. We argue that some states in India have better institutions than others, and these have set better policies. We suggest that the level of political accountability and the quantum of 'point resources' such as minerals would have an impact on the quality of institutions. The idea being that a region can be 'cursed' with high mineral wealth and having unaccountable politicians. This can lead the politician

to try to subvert institutional quality in these regions to facilitate ‘rent seizing’, leading to lower developmental and growth prospects for such states. We try to examine this through a theoretical model as well as an empirical exercise.

The second essay (chapter 3) is more empirical in its construct and analyses the impact of political affiliations and the quality of fiscal institutions on regional budget constraints. While we do not make any normative judgments here regarding the welfare implications of soft budgets, we argue that the correct political alignment and poor fiscal institutions might combine to lead a state to greater fiscal profligacy. This is because of the inability to have institutional checks on expenditures and due to a higher probability of an *ex post* bailout by the central government, through higher *ad hoc* transfers.

The third essay (chapter 4) considers not merely ‘budgetary output’ levels such as the quantum of expenditures, in isolation, but looks at the ‘outcomes’ of such expenditures, viz. the impact of expenditure on health on an ‘outcome’ indicator like Infant Mortality Rates (IMR) across the major Indian states. It may be argued that analyzing the budgetary allocations on any expenditure tells half the story. Since the Indian states are constitutionally required to spend more on human development expenditures such as health and education, the correct way to look at ‘effective’ expenditure would be to analyse the determinants of variation in ‘outcome’ indicators. We in our essay, consider variations in IMR to be our measure of ‘outcomes’. We suggest that political accountability might have a major role in determining human developmental outcome levels through better utilization of expenditures.

Since it was suggested in the second essay that the potentially harmful impact of poor fiscal institutions and political alignment, is softening of the budget constraint, our final essay (chapter 5) is a theoretical piece of work, which looks at the micro-

foundations of a 'soft budget constraint' and tries to analyse the normative issue of the welfare considerations in this regard. We try to prove two concomitant factors in the federalism and soft budget literature. First, contrary to some of the existing literature, decentralization, need not automatically increase a commitment to the hard budget and second, in normative terms, under certain circumstances, a 'soft budget' is preferable to a 'hard budget'.

2. The Political Economy of Resources and Development in India

2.1. Introduction

The Indian development process has been skewed with states that are over-achievers and others that are under-performers. The reasons for this variation have never been satisfactorily explained. The literature on the comparative development of countries is suggestive and identifies factors such as the savings rate, population growth rates, human capital and technological changes, all of which determine the growth rate at which economies converge.¹ There is a parallel literature on the economic performance of Indian states (Rao, Shand and Kalirajan (1999), Ahluwalia (2001), Aiyar (2001), Bajpai and Sachs (1999) and Nagraj, Varoudakis and Veganzones (1998), Sachs *et al* (2001)). These suggest that growth rates have tended not to converge over time, leading to inequality across states. There is also a growing consensus that the diverging pattern of development is largely a consequence of policy differences. Reform oriented states, have adopted sound fiscal and public investment policies and have grown more rapidly than their reform-resistant counterparts (Bajpai and Sachs 1999).²

While the literature on the performance of the Indian states is informative, it provides no formal explanation for why some states have endorsed growth-generating policies while others have not. This suggests the need to investigate the political and economic incentives of policy makers. This chapter focuses on an overlooked aspect of the problem – the link between the resource rents of a state and the resulting policy

¹ See Solow (1956), Pugno (1995), Lucas (1988) and Romer (1996) for detailed expositions

² The former category includes Andhra Pradesh, Gujarat, Karnataka, Maharashtra and Tamil Nadu, while examples of reform failures include Bihar, Madhya Pradesh, Assam, and Orissa.

choices of elected governments.³ Our analysis is related to the burgeoning literature on the resource curse hypothesis, which we extend in two ways. First, we develop a simple political economy model of policy choice, which identifies circumstances under which resource rents induce institutional erosion and suboptimal policies. Second, we empirically test the key predictions using data from the Indian states. This approach contrasts with much of the resource curse literature, which studies cross-country comparisons of growth.

The focus on the role of natural resource endowments on state performance seems appropriate in the Indian context for a number of reasons. First, the distribution of minerals across the states is highly skewed, with for instance one state (Assam) accounting for almost all known petroleum reserves⁴. More generally, 25 per cent of all mineral resources are concentrated in the two states of Bihar and Madhya Pradesh. Coal is found in Bihar, West Bengal, Orissa, Madhya Pradesh and Andhra Pradesh⁵ (Singh and Kalirajan, (2002)). The fact that mineral endowments in a state are exogenous provides a useful benchmark to study the impact of resource rents on policy choices. Second, under the Mines and Minerals (Development and Regulation) Act of 1957, mineral extraction is undertaken and controlled by the central government, even though the state governments are the legal owners of mineral resources. However, the states receive royalties from the central government, which is the eventual arbiter on most matters relating to mineral extraction (such as environmental safeguards, royalties and other disputes). It is arguably of economic

³ Interestingly Sachs *et al* (2001) do touch upon the ‘resource curse’ problem, when they argue that resource based industries do not provide the growth potential of manufacturing industries, because the former stagnate, while the latter provide linkages with other sector. They realise that ‘a lopsided industrial structure is a symptom rather than a cause of the problem’ (p 18).

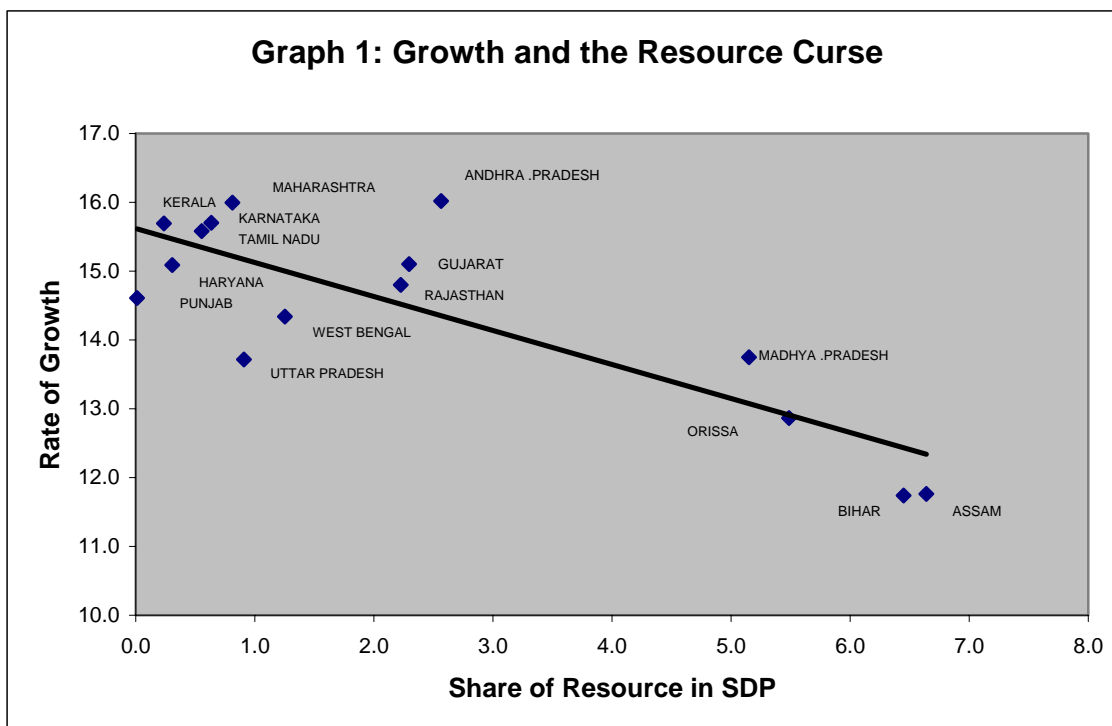
⁴ Excluding the ‘off-shore’ oil reserves, which are directly owned by the Central Government.

⁵ The share of mining in state domestic product also shows variation. It accounts for 6.4 per cent of the SDP of Bihar (average for 1985 – 2000), 5.2 per cent for Madhya Pradesh, 5.5 per cent for Orissa and 0.6 per cent for Tamil Nadu, and less than 0.1 per cent for Punjab.

significance to examine how these quasi lump-sum royalties influence state government policy decisions.

Perhaps a more compelling reason for investigating this issue in the Indian context is indicated by the data. Graph 1 provides a simple plot of state economic growth (average for the period 1985 –2000) and the share of mineral production in state domestic product (SDP). The graph reveals two clusters. The states of Assam, Bihar, Madhya Pradesh and Orissa have a high share of mineral resources but a lower rate of growth. Hence, there is at least superficial evidence of a possible link between mineral endowments and economic performance. There are, however, anomalies in the data: Uttar Pradesh with a lower proportion of mineral resources, has a growth rate equal to that of Madhya Pradesh, similarly Andhra Pradesh, which has a larger resource wealth than Rajasthan, has a higher rate of growth. The aim of this chapter is to explore these issues in greater detail and provide at least a partial explanation for the reasons why mineral rents appear to have an immiserizing impact in some states but not others.

A final reason for focusing on a single country (rather than a cross country study as is common in tests of the resource curse) is that it allows for a more precise interpretation of the empirical results. Many of the factors that vary across countries (such as political systems, trade and exchange rate regimes, judicial systems) are common within a country. This implies that there are likely to be fewer missing explanatory variables and unaccounted interactions in the regressions, resulting in a more controlled regression and coefficients that are more easily interpreted.



Source: Planning Commission of India

We develop and test a political economy model, which investigates the impact of resource endowments on policy choices. In keeping with the political economy literature, politicians are assumed to be self interested and care about the payoffs from holding office. These include the discretionary rents obtained from subverting resource rents for personal use and the intrinsic utility from holding office. Appropriation of resource rents may result in apprehension and expulsion from office. Not unreasonably, we assume that the probability of conviction and exclusion from office, is increasing in the efficiency of the judiciary and other public institutions. In a democratic system, even if a politician evades conviction, (s)he may still be held accountable for her policies by the electorate. To capture the impact of political accountability, it is assumed that electoral support for the government is increasing in the level of policy dependent citizen welfare.⁶

⁶ While we do not explicitly model the political process, we employ this assumption, which is common in the political economy literature and has been justified in several ways. For instance, in a democratic

We consider an economy with three sectors: a resource sector, a state government sector and a private manufacturing sector. Resource extraction is undertaken independently by the central government, which pays a fraction of the resource rents as a royalty to the states. The state government produces public goods such as infrastructure services, which facilitate private sector production. The state government also chooses the level of institutional efficiency through its investment decisions. Productivity in the public sector is increasing in the efficiency of the judiciary and other public institutions.⁷

In this simple framework we ask whether the extra rent paid to a state will be used to govern prudently or wastefully. The outcome depends on two factors: the level of rents and the degree of political accountability. First, for the benefits of rent appropriation to exceed the expected costs (of conviction and dismissal), the level of available rents must be sufficiently large. Second, in a democratic system, the degree of political accountability plays a key role in shaping policy decisions. In a system with a low level of political accountability, the government has greater scope to set policies that deviate from the welfare maximising level. Hence when higher resource rents increase the relative payoffs from rent appropriation rise and this tends to magnify policy distortions. To facilitate rent embezzlement, investment in judicial efficiency declines and as a result public sector output of essential services such as

system policies that improve general welfare are more likely to make the median voter better off. In a probabilistic model of political competition too voters can be expected to favour the party that offers higher welfare levels. In autocratic regimes, the payoffs from rebellion are likely to be lower; the higher is the level of welfare (Tullock 1987).

⁷ There are a number of reasons why public sector productivity would depend on the efficiency of institutions. For instance, an efficient judiciary is essential to underpin compliance with tenders issued by the public sector. In India rigid labour market regulations have hampered numerous attempts at improving public sector efficiency. A well functioning judiciary is seen as a necessary adjunct to implementing such reforms, which are typically contested in the courts by unions. For instance a recent report on the Task Force on Employment Opportunities (2001) notes “labour laws in practice make it very difficult to dismiss an employee.....The problem in this case is not so much with the law as with the judicial and extra-judicial machinery, but the net effect is that the employers are often unable to maintain discipline.”

roads and infrastructure decline. Since the manufacturing sector productivity partly depends upon these infrastructure services, manufacturing output also declines.⁸

Resource rich states trapped in these conditions will exhibit lower levels of development. Conversely, in a system with a high level of political accountability, an increase in resource rents induces the government to invest in institutional efficiency, since this increases welfare and raises the probability of retaining office.⁹ In sum, if resource rents are sufficiently large, then the lower (higher) is the level of political accountability the greater (lesser) is the magnitude of policy distortion.

Political accountability is likely to be deficient in systems where the level of political rivalry is low, or when voting is determined by factors other than economic welfare, such as, race, class or religion. This is corroborated in the recent World Development Report 2004, (p 45), which contrasts the political incentives of two Indian States, Kerala and Uttar Pradesh which are at opposite extremes of the development spectrum: “Political incentives matter for service delivery and actual development outcomes. Delivering broad universal basic services has remained a credible political platform in Kerala in contrast to the clientelist and class-driven politics of Uttar Pradesh.” The report further notes that in Kerala political competition was conditioned on better delivery of basic services through better allocations in education and health. In contrast in Uttar Pradesh, caste and class-based divisions “led to poor political incentives for effective provision of universal, basic services.”

⁸ Investment in institutional efficiency declines for two reasons. First, inefficient institutions facilitate evasion of prosecution. Second, there is a budgetary effect. Increased rent appropriation implies that less funds are available for other purposes.

⁹ Political accountability acts as the disciplining force in the model, suggesting that if a more politically accountable region gets access to more revenues (in our case through resource rents), it will be more inclined to spend it on better institutions, since this raises welfare and increases the chances of re-election.

The empirical results provide substantial support for these theoretical predictions. States with low levels of political competition and accountability are found to have weaker judicial institutions. If in addition these regions are resource rich, they suffer further institutional erosion. Development failures are correlated with resource rich states that have low levels of political competition and hence weak institutions. This result holds for regressions conducted on both the level and growth of state domestic product (SDP).

The remainder of the chapter is organised as follows. Section 2.2 provides a brief literature review of the resource curse hypothesis and the underlying political economy literature. Section 2.3 develops a formal model linking resources and institutions to development. The empirical tests and results of the model predictions are obtained in Section 2.4. Section 2.5 empirically analyses the links between resources, institutions and economic growth using the methodology of the existing literature and Section 2.6 concludes.

2.2. Literature Review

A study by Sachs and Warner (1995) observes surprisingly that ‘resource-poor economies often vastly outperform resource rich economies in economic growth.’ (p.1). The authors suggest a number of reasons for this phenomenon – the first one being social, where easy wealth stymies innovation and effort. Another explanation is the so called Dutch disease models – which hypothesises that a resource boom leads to an appreciation of the country’s exchange rate leading to a contraction of its manufacturing sector, due to declining manufacture exports or diversion of labour and capital away. This theory makes the assumption, that it is the ‘manufacturing sector’,

which is the main driver of growth for a region. This argument stems from the Prebisch-Singer 'dependency theory', which suggests that countries which mostly rely on resource exploitation (developing countries) would be unable to grow effectively, because of the higher relative growth in export prices of manufactured goods vis-à-vis primary goods. Thus the 'Prebisch hypothesis' argued that even though there is an attraction of resource rich developing countries to exploit their natural resources, the terms-of-trade would usually be arrayed against natural resources, and hence countries should focus on industrialisation. However, it is difficult to empirically support either the Dutch disease hypothesis or the Prebisch-Singer analysis from the point of view of a curse. First, a decline in the size of the manufacturing sector need not necessarily mean a 'curse', since this ignores the complexities such as why 'resource abundance retards growth in some countries e.g. Nigeria, Venezuela, and promotes development in others e.g. Australia, Malaysia' (Bulte *et al* (2003)). The policy solution offered by Prebisch, viz. development of industries through tariff protection, also failed to aid in the growth of most developing countries. Thus, the new theories have focused on the consequences of or alternatives to resource led growth.

The political-economy literature suggests that resource-rich economies have a greater propensity to be subjected to rent-seeking behaviour by those in power. The resource appropriation argument rests on the presumption that the rent seekers through bribes or distorted public policies can easily corner the resource in question. Torvik (2002) in a recent paper has shown how a resource boom might reduce economic growth. His model assumes that the government gets resources from two sectors – (1) sale of natural resources and (2) taxation of manufacturing. The public can acquire income either through obtaining shares of the natural resource sector (rent

seeking) or invest ‘productively’ in the manufacturing sector. A resource boom leads to greater numbers of investors choosing the rent seeking option while eschewing the manufacturing sector. Assuming that returns to scale in the manufacturing sector show increasing returns, this leads to a vicious cycle of falling income, demand and profits in the manufacturing sector, where the fall is greater than the rise in natural resource income. Thus a resource boom actually hurts economic growth.

Isham *et al* (2003) look at channels through which the resource curse¹⁰ impacts upon political outcomes. They suggest channels such as ‘rentier effect’, ‘delayed modernisation effect’ and the ‘entrenched inequality effect.’ Isham *et al* (2003) argues that in a resource rich economy, the State itself might turn rentier entity.

The influential work of Easterly and Levine (2003) argues that the endowments of a region impacts upon the institutions, which in turn affect the growth prospects of the region. Their contention is that macro-economic policies do not explain differences in cross-country GDP per capita after accounting for the ‘impact of institutions on endowments’ (p 35). This chapter builds upon the earlier works of Acemoglu *et al* (2001, 2002), which focuses on the deep determinants of development *viz.* institutions. This chapter suggests that the nature of colonization would have had an impact on the quality of institutions. Thus those countries where the colonisers settled *viz.* United States, Australia and New Zealand, they set up institutions to support property rights etc., whereas, those colonies, where the aim was merely to extract wealth, did not get the benefits of better institutions.

Ross (2001) argues that ‘point-resources’ (oil, minerals) degenerate institutions to the extent that it impedes democratisation due to the ‘rentier effects’, by

¹⁰ The authors look at a specific resource *viz.* oil

which a government uses low taxes and high expenditures to ‘dampen pressures for democracy’ (p. 356).

There have been a few studies on the economic performance of Indian states. Papers by Ahluwalia (2001), Aiyar (2001), Bajpai and Sachs (1999) and Nagraj, Varoudakis and Veganzonnes (1998) have dealt with it. Ahluwalia (2001) analyses the growth of the 14 major States during the pre reform (1980s) and post reform (1990s) phase and suggested that inequality across states as measured by the gini coefficients increased.

Bajpai and Sachs (1999) analyse the performance of the 15 major states in the post reform period (1990s) and find that the ‘reform-oriented’ States¹¹ perform better at both economic and social indicators. Another paper by Sachs, Bajpai and Ramiah (2001) find weak or no convergence in growth across Indian States and they expect that ‘growth will continue to be urban led’¹² (p. 22).

Aiyar (2001) considers the in-equalities as given and tries to analyse whether there was evidence of ‘convergence’ across the Indian states using a dynamic panel data with fixed effects and finds that the states are ‘converging to different steady states’ (p.164).

Nagraj *et al* (1998) use principal component analysis to analyse the growth performance of Indian states. The grouping of the states is done on the basis of physical, social and economic infrastructure. They do not find evidence of conditional convergence¹³ across states, and believe differences in structure of production,

¹¹ includes Andhra Pradesh, Gujarat, Karnataka, Maharashtra and Tamil Nadu

¹² Interestingly Sachs *et al* (2001) do touch upon the ‘resource curse’ problem, when they argue that resource based industries do not provide the growth potential of manufacturing industries, because the former stagnates, while the latter provides linkages. They realise that ‘a lopsided industrial structure is a symptom rather than a cause of the problem’ (p 18).

¹³ Conditional convergence implies that different regions might converge in growth rates but not in per capita levels.

infrastructure endowments and state specific fixed effects account for the disparities across states. They suggest the policy of efficient public investment, by targeting infrastructures that have the highest payoffs.

However, none of the papers address the endogenous causes of in-equality and appear to favour the ‘policy’ approach, suggesting that States, which implemented better macro-economic or public investment policies, has had a better growth impact. We in our analysis of the causes for variation in income levels and growth across regions wish to look at an alternative paradigm where the political economy of resources might have an impact on developmental levels.

This work is closely related to the growing literature on the resource curse. Early work on the “curse” emphasised Dutch disease explanations: exports from a booming resource sector lead to an appreciation of the exchange rate, which crowds-out growth in other sectors of the economy.¹⁴ More recently attention has shifted to the rent seeking aspects of resource endowments. Baland and Francois (2000) and Torvik (2002) present models where resource abundance increases the payoffs from unproductive rent seeking behaviour and lowers overall growth. Case studies and the most recent empirical studies now demonstrate that the resource curse only afflicts countries with weak institutions (Auty (2001), Isham *et al* (2003)). These suggest that countries with weak institutions and an abundance of “point” resources (i.e. resources extracted from a narrow geographic base such as minerals) experience lower growth rates. While informative, this finding raises further important questions. Since institutions play a crucial role in determining whether resources promote or constrain growth, it is necessary to explain why some countries have weaker institutions than others. Acemoglou *et al* (2002) argue that the fundamental institutional structures in

¹⁴ This is unlikely to have occurred in India where most mineral products are domestically consumed.

developing economies are largely exogenous, having been bequeathed by their colonizers.¹⁵ In contrast, there is an emerging (descriptive) political science literature, which suggests that institutions are endogenous and can be modified by rulers. They therefore depend on the political and economic incentives of political elites (Ross 2001). To our knowledge, formal modelling of the links between resources and institutions has not been undertaken. This work seeks to partially fill this gap in the resource curse literature by analysing the interplay between resource rents, institutional development and public policy in the Indian context.

2.3. The Model

In this section we develop a simple political economy model of policy decisions. Since the focus of the analysis is on the interaction between resource rents and policy choices, we abstract from a large number of other factors (such as the effects of coalition governments, the revenue capability of states, environmental resistance to mining) that influence government decisions.

There are three agents in the model: the state government, workers and entrepreneurs. Workers may either choose to work for the government, or in the private sector (say manufacturing). The utility of workers is given by

$$U = w^g L^g - e^g(L^g, \beta(I)) + w^m L^m - e^m(L^m) \quad (1)$$

where $N = L^g + L^m$ is the total endowment of labour time; L^g is labour time spent in the public sector, w^g is the public sector wage rate, L^m is time devoted to manufacturing sector employment, w^m is the manufacturing sector wage rate. The functions $e^g(L^g, \beta(I))$ and $e^m(L^m)$ capture the disutility of work in each sector, which

¹⁵ This explanation is perhaps of less relevance to India, which was largely governed by a single colonial power - the British. While there may have been differences in the quality and functioning of

is increasing in labour inputs: $\partial e^i / \partial L^i > 0$, $\partial^2 e^i / \partial L^{i2} > 0$ ($i=g, m$). The term $\beta(I)$ measures the effects of improvements in managerial oversight and institutional efficiency on the disutility of workers employed in the public sector. I is a measure of judicial and institutional efficiency and β captures the associated disutility of workers. It is assumed that greater judicial and institutional efficiency inhibits the ability to shirk and thus raises the disutility of public sector work. Hence: $\partial \beta / \partial I > 0$, $\partial e^g / \partial I > 0$, $\partial^2 e^g / \partial I^2 > 0$.¹⁶

The state government produces public services such as the provision of essential infrastructure (electricity, roads), used by the private sector. The output of public sector services depends on the quantity of labour employed and the efficiency of workers ($\beta(I)$) due to improved institutional capability. The production function for public services is given by: $M = M(L^g, \beta(I))$. As usual there are decreasing returns to inputs: $\partial M / \partial L^g > 0$, $\partial^2 M / \partial L^{g2} < 0$, $\partial M / \partial I > 0$, $\partial^2 M / \partial I^2 < 0$.

Output in the manufacturing sector depends on labour inputs (L^m) and the essential public services (e.g. roads, electricity, judicial services) that are supplied by the government ($M(L^g, \beta(I))$). The profits of entrepreneurs in the private sector is given by

$$\Pi = PQ(L^m, M(L^g, \beta(I))) - w^m L^m \quad (2)$$

institutions across the states and regions under colonial rule, it is unlikely that the variation in institutional structures are large enough to explain the diverging policy responses across states.

¹⁶ The Report of the Task Force on Employment Opportunities (2001), by the Planning Commission, Government of India recommends a 'comprehensive review of labour laws' (p 153) and notes the consequences of judicial incompetence. It argues that the Industrial Disputes Act, 1947 which governs 'retrenchment and layoffs' are usually interpreted 'in a manner which makes retrenchment virtually impossible' (p 154). The report says that a number of cases were treated by the judiciary as retrenchment, when they were never meant to be so. For example, non-renewal of contract at the end of the contract period is treated as retrenchment. Similarly it is virtually impossible to dismiss an employee. This has led to pervasive shirking and indiscipline in a number of Public Sector Undertakings.

where P is the given price and $Q(L^m, M(L^s, \beta(I)))$ is output, $\partial Q / \partial L^m > 0$,
 $\partial^2 Q / \partial L^{m2} < 0$, $\partial Q / \partial I > 0$, $\partial^2 Q / \partial I^2 < 0$, $\partial Q / \partial M > 0$ and $\partial^2 Q / \partial M^2 < 0$

Turning next to the government. The state government is assumed to be self-interested and cares about the payoffs from holding office. These include: the intrinsic utility from holding office and the discretionary rents obtained from embezzling the state's mineral royalties that are paid by the central government.¹⁷ Misappropriation of royalties (or other public funds) carries a risk of detection and if a politician is successfully convicted, this results in expulsion from office.¹⁸ It is assumed that the probability of being successfully convicted and expelled from office is increasing in the efficiency of public institutions such as the judiciary (I)¹⁹. Let $\eta(I) \in [0, 1]$ be the probability of successfully convicting a corrupt politician. Thus with probability $(1 - \eta(I))$ a corrupt politician evades prosecution and remains in power.

In a democratic system, even if politicians evade prosecution, the electorate may still hold them accountable for their policies. Following much of the political economy literature we therefore assume that the government's ability to retain power is increasing in the level of policy dependent citizen welfare. This assumption

¹⁷ Endemic corruption in the mineral industry has been widely reported in the press. For instance, the Hindu Business Line (February 4, 2003) describes the 'Coal Mafia' which masterminds the illegal trade in coal and involves a nexus of politicians, contractors, transporters and employees of coal companies. It was reported that "while investigating 4200 supply linkages, the authorities found as many as 1300 fake companies and 2200 companies not in production", indicating wide-spread corruption.

¹⁸ Under the Representation of Peoples Act, 1951, a person may be disbarred from holding an office or contesting an election under a number of disqualifications. These Statutory disqualifications, include – The Prevention of Corruption Act, 1988 and Section 9 of the Representation of Peoples Act, 1951, states that a person in public office convicted of corruption is disqualified from holding public office for a period of 5 years.

¹⁹ The term 'institution' in our model is broadly defined to include 'fundamental institutions' like the judiciary, necessary for both political and administrative reforms. Thus institutional quality not only prevents shirking of workers in the public sector, but also serves as a credible disciplining device to control the appropriation of public funds by politicians in government. It is recognised that the term institutions is seldom defined in the economics literature and is often use as a generic term to capture a variety of widely differing aspects of governance. Our use of the term is somewhat narrower.

captures in a simple way the notion that in most political systems, welfare-improving policies are likely to raise the level of support for the incumbent government.²⁰ Let W be the level of aggregate welfare and let $f(W) \in [0, 1]$ be the probability that the government retains power. It is assumed that $f' > 0$ and $f'' < 0$. Thus, the probability that a rent appropriating government evades prosecution and retains power is given by: $(1 - \eta(I))f(W)$. The government's expected utility is:

$$G = (1 - \eta(I))f(W)(\alpha R + S) \quad (3a)$$

where R is resource rent royalties received from the central government, α is the proportion of the royalties that are appropriated by the government for personal use, S is the intrinsic utility from holding office, W is the level of aggregate citizen welfare defined as the sum of worker's and entrepreneurs payoffs: $W = U + \Pi$.²¹ For simplicity, when the incumbent government loses power its utility is normalised to zero.

Finally, the state's budget constraint is given by:

$$(1 - \alpha)R = w^g L^g + c(I) \quad (3b)$$

where $c(I)$ is the cost of improving the efficiency of institutions I , $c' > 0$, $c'' > 0$.²²

The sequence of events in the model is as follows. The government moves first and sets its policies (i.e. level of investment in institutional efficiency (I), the public sector wage rate (w^g) and the proportion of mineral royalties appropriated (α)). Observing the government's policies, the private sector determines output levels. In

²⁰ Since the focus of this model is on the link between resource wealth and policy choices, we do not explicitly model the political process. It is important to note, however, that in most models of political competition, *ceteris paribus* the party with policies that offers the highest level of expected utility to the average voter wins the election (Persson and Tabellini 2002). Our assumption captures this result in a simple way without introducing inessential algebraic complexity in the model.

²¹ Citizen welfare is thus defined in the conventional utilitarian manner as the sum of all private sector agents' payoffs. As is common in the literature, we ignore distributional concerns.

²² There are of course other components of a state budget such as taxes, which we ignore in order to focus on the link with resource rents.

the final stage, given knowledge of the wages offered in each sector, the workers decide on their allocation of effort between manufacturing and public sector employment. By backward induction, we begin by solving the final stage of the game.

2.3.1. Workers

Maximising equation (1), the first order condition for the workers' labour allocation decisions is given by:

$$w^g - \frac{\partial e^g}{\partial L^g} - w^m + \frac{\partial e^m}{\partial L^g} = 0 \quad (4a)$$

Effort is allocated to each sector to equalise the net marginal payoffs from working in each sector. For future reference we note that by total differentiation of (4a):

$$\frac{dL^g}{dw^g} > 0, \quad \frac{dL^g}{dw^m} < 0 \quad \frac{dL^g}{dI} < 0 \quad (4b)$$

Thus, a higher wage paid in the public sector, draws labour away from manufacturing

($\frac{dL^g}{dw^g} > 0$) and hence *ceteris paribus* public sector output rises. Conversely, a higher

wage paid in manufacturing induces an outflow of labour from the public sector

($\frac{dL^g}{dw^m} < 0$) and a decline in public sector output. Similarly, greater investment in

institutional efficiency makes shirking more difficult in the public sector and hence

leads to an outflow of labour ($\frac{dL^g}{dI} < 0$)²³. The impact of improved institutional

efficiency on public sector output levels is, however, ambiguous. This is because

outflow of labour lowers public sector output, while investment in institutional

efficiency raises the productivity of the smaller labour force:

$$\frac{dM}{dI} = \frac{\partial M}{\partial I} + \frac{\partial L^s}{\partial I} \leq (>)0 \quad (4c)$$

In what follows we focus only on cases where institutional investment raises public sector output and hence private sector productivity (see equation 2). This is clearly a necessary condition, which must hold for any institutional reform to occur in this model.²⁴ It is therefore reasonable in this context to assume that $\frac{dM}{dI} > 0$.

2.3.2. *Entrepreneurs*

Consider next the private sector's response in the second stage. Given knowledge of the workers' optimal responses (equation (4b)), firms determine production levels, taking as given the policies of the government. Maximising equation (2) with respect to the wage rate:²⁵

$$\frac{\partial \Pi}{\partial w^m} = P \left(\frac{\partial Q}{\partial L^m} \frac{\partial L^m}{\partial w^m} + \frac{\partial Q}{\partial M} \frac{\partial M}{\partial L^s} \frac{\partial L^s}{\partial w^m} \right) - L^m - \frac{\partial L^m}{\partial w^m} w^m = 0 \quad (5)$$

2.3.3. *State Government*

Consider next the government's policy choices. Given knowledge of the optimal responses of citizens, the government chooses α , I and w^s to maximise equation (3a), subject to the budget constraint (3b). The first-order-conditions are:

²³ We can, of course assume that institutional efficiency can make shirking difficult in both the public and private sector. In which case there is no outflow of labour from the public sector, rather there is just an increase in productivity. This only strengthens our assumption below that $dM / dI > 0$

²⁴ Were this not the case, then investment in costly institutional reform would be welfare reducing. More significantly we show that this case never arises in the equilibrium of the model, since the government always sets I below the welfare maximising level. This implies that greater investment in I never lowers welfare.

²⁵ It is instructive to assess the firms' responses to changes in the government's wage rate. Totally differentiating (5) yields the firms' optimal response: $dw^m/dw^s > 0$. Thus wage setting exhibits strategic complementarity: higher public sector wages induce the private sector to also pay higher wages. The intuition for this outcome is the following. Increased public sector wages, draws labour away from the manufacturing sector. To arrest this decline in the labour force, firms must increase their wage offer. This is the usual labour market effect. This is reinforced by a public service productivity effect. Higher public sector employment is associated with a greater supply of public services, which boosts manufacturing productivity and thus increases the demand for labour.

$$\frac{dG}{d\alpha} = R(1 - \eta(I))(f(W) - \alpha f'(W)R) = 0 \quad (6a)$$

$$\frac{dG}{dI} = \alpha R[-f(W)\frac{\partial \eta}{\partial I} + (1 - \eta(I))f'(W)\frac{dW}{dI}] = 0 \quad (6b)$$

$$\frac{dG}{dw^g} = \alpha R(1 - \eta(I))f'(W)\frac{dW}{dw^g} = 0 \quad (6c)$$

where $\frac{dW}{dI} = \frac{\partial \Pi}{\partial I} + \frac{\partial U}{\partial I}$, $\frac{dW}{dw^g} = \frac{\partial \Pi}{\partial w^g} + \frac{\partial U}{\partial w^g}$

The interpretation of these conditions is straightforward. In equation (6a) the proportion of royalties (R) appropriated is determined by comparing the private benefits of embezzlement, against the associated political costs. The political costs arise because rent appropriation increases the probability of losing office.

Equation (6b) determines the level of investment in institutional efficiency. Institutional improvements have conflicting effects on the government's payoffs. On the one hand, better institutions lead to improvements in public services, thereby raising welfare and the probability of retaining office. This, however, comes at a price. Institutional improvements also raise the probability of prosecution for resource rent appropriation and other misdemeanors. In determining the level of institutional investment, the government will trade-off these conflicting effects.

Finally by equation (6c) public sector wages are set at the welfare maximising level. Intuitively, there is no incentive to distort public sector wages since these do not affect resource rent appropriability. Hence the probability of retaining office is maximised by setting wages at the welfare maximising level.²⁶

²⁶ However note that if a higher (lower) weight is assigned to (say) workers in the welfare function (perhaps because of their electoral importance), then public sector wages will be higher (lower) than in the welfare maximising equilibrium. Introducing different weights increases the algebraic complexity of the model but does not alter the main conclusions derived in the following propositions.

2.3.4. Model Predictions

It is useful to begin by comparing policies in the political equilibrium with those in the welfare maximising equilibrium. All proofs are in the Appendix A.1.

Proposition 1a: In the welfare maximising equilibrium there is no appropriation of resource rents, while in the political equilibrium a fraction of the resource rents are extracted for personal use. Compared to the welfare maximising outcome, there is a lower level of investment in institutional efficiency in the political equilibrium (Proof: Appendix A.1.1).

Intuitively, the government is completely self-interested and cares about social welfare only because it increases the probability of retaining power. Consequently policies are steered towards increasing the level of resource rent extraction and raising the survival probability of the government. Hence, to evade conviction for rent embezzlement there is an incentive to under-invest in institutions such as the judiciary. However since the survival prospects of the government also depend on the level of citizen well being, the welfare impacts of judicial erosion cannot be completely ignored. This serves to limit the degree of institutional attrition.

Consider next the effects of political accountability on policies.

Proposition 1b: As the level of political accountability increases (declines), the level of resource rent embezzlement decreases (increases) and investment in institutional efficiency increases (decreases) (Proof: Appendix A.1.2).

In political systems with a low level of political accountability, the link between the probability of government survival and social welfare is weak. Hence the government places less weight on the welfare effects of its policies. Formally, in equations (6a-6c) the weight given to the marginal welfare effects of each policy is determined by

$f'(W)$, which measure the impact of welfare changes on the probability of government survival. As $f'(W)$ falls then so too does the weight given to the welfare effects of a policy and *ceteris paribus* there is a greater degree of rent appropriation and judicial erosion which is necessary to facilitates such appropriation.

Finally, we analyse the effects of an increase in resource rent royalties on policies. In general, the impact of resource rents on institutional investment is found to be ambiguous. Higher resource rents can either be appropriated by the government, or used to govern prudently. Political incentives determine which strategy will be followed. For rent appropriation to be profitable, the available rents must be sufficiently large. If in addition the level of political accountability is low, the government has greater scope to set policies that deviate from voters' preferences. Hence an increase in available rents induces under-investment in judicial efficiency, since this facilitates rent appropriation. Moreover, since private and public sector productivity also depends on the level of institutional efficiency, there is a decline in output levels. Thus the "resource curse" obtains and policies shift further away from the welfare maximising outcome and output levels decline. This result is summarised in the following proposition:

Proposition 2: When the level of political accountability is sufficiently low and the rents available for misappropriation are sufficiently high, an increase in resource rents will lead to a greater rate of rent misappropriation and lower investment in institutional efficiency. Manufacturing output levels also decline (Proof: Appendix A.1.3).

In summary the results suggest that weaker institutions will be observed in states and regions with low levels of political accountability. If in addition these regions are resource rich, this will result in further institutional erosion and even

lower levels of development. Thus resource induced institutional erosion and underdevelopment is conditional upon the level of political accountability.

2.4. Empirical Tests and Results

In this Section we subject these theoretical conjectures to empirical scrutiny using data from the Indian states. Similar to Easterly and Levine (2003), the model suggests that resources affect the level of economic development, through the impact on institutions. However, our analysis predicts a more nuanced conclusion. It suggests that resource availability adversely affects development levels only when political accountability is low. Hence the resource curse eventuates in states with low levels of political accountability and sufficiently large resource rents.

We consider the 15 major states of the Indian union, which accounts for over 90 per cent of the population and 95 per cent of the gross domestic product. The period of consideration is from 1985 to 2000. Descriptive statistics are summarised in Table 1. The data used is a balanced panel. All the data pertaining to the State domestic products and its components, population, literacy rates and urbanisation are from the Planning Commission²⁷. The data relating to elections are obtained from the Election Commission of India. In this case since elections at the state level are normally held at five year intervals (more frequently if the government in power fails to secure absolute majority), typically most states have had about 3 elections in the period under consideration. In this case the computed data is taken to be the same for the years between the two elections. The data pertaining to the criminal cases pending has been taken from the 'Crime Records Bureau' and pertain to an average for the period 1996 – 1999. We assume that these proportions would not have changed

significantly overtime and would therefore be a good approximation of the quality of the judiciary.

2.4.1. Empirical Tests

The predictions are tested using a 2SLS system of equation with instrumental variables:

$$[Institutions]_{it} = \alpha_0 + \alpha_1[resources]_{it} * [political\ accountability]_{it} + \alpha_2 X_{it} + u \quad (7a)$$

$$[SDPPC]_{it} = \beta_0 + \beta_1[institutions]_{it} + \beta_2 Y_{it} + v \quad (7b)$$

where X_{it} and Y_{it} are the set of conditioning variables (described later), $SDPPC$ is state domestic product per capita variable and u and v are the error terms.

Proposition 1b predicts that the impact of resources on institutions is conditional upon the level of political accountability. Hence it is predicted that $\alpha_1 > 0$. By Proposition 2 weak institutions lead to lower output levels. Hence $\beta_1 < 0$.

The reason for considering a 2SLS estimation method is obviously the presence of ‘endogeneity’ in our system of equation. Institutional Quality might be related to the wealth/ income of the state as might the nature of electoral competition. It is therefore necessary to choose the correct exogenous variables to instrument out these potential endogenities. In the model a fundamental institutional variable such as the quality of judiciary is used to trace the impact of resource rents on policies. The closest empirical proxy that is available to capture judicial quality is the proportion of criminal cases pending across the states in India in the 1990’s. This is termed *CRIMEDISP*. The inference being that, better (worse) judicial institutions would have a lower (higher) proportion of cases outstanding.

²⁷ While most of the data are available annually, some like ‘urbanisation’ and ‘literacy rates’ are available at different points of time. However, the time periods are consistent across States and

Following Isham *et al* (2003) and other similar studies, mineral resources are measured as the share of mining in state output. We use two measures: resource shares in the initial period (1985) and contemporary resource shares. This allows us to test the robustness of our results to variations in this measure.²⁸

Finding direct measures of political accountability is difficult. In much of the political science literature it is argued that electoral competition tends to promote political accountability. We therefore use a measure of political competition as an empirical proxy for political accountability, but in the following section we also note the limitations of this measure. Following Vanhanen (2000) and a large political science literature, electoral competition is measured through the interaction of two associated terms – (i) the proportion of voters exercising their right to vote²⁹ and (ii) the proportion of voters who vote for the opposition. Not unreasonably, this measure implies that the greater is the fraction of the population that votes for the opposition, the greater is the level of political competition and the greater is the pressure on the incumbent government to deliver policies that reflect voter preferences. A politician’s ‘survival probability’ can then be defined as: $SURVIVCOMP = (1 - electoral\ competition)$. The model predicts that the higher (lower) the resource rents and the higher (lower) the survival probability, the poorer (better) will be the institutional quality. We therefore define an interaction term between resource endowments and survival probability, referred to as *SURMINESDP* in the following Tables.

We perform the Hausman Specification test for endogeneity using these exogenous proxies and predetermined variables. The tests confirm that the residuals

consequently we do not anticipate any compatibility problems.

²⁸ While it is acknowledged that current resource shares may not be entirely exogenous (because of say reverse causality), there may be merit in using this measure. For instance it captures the impact of new mineral reserves, which initial period endowment measures do not.

²⁹ In India it is not compulsory to vote, unlike say Australia and therefore the first term is usually less than 1.

are not significantly different from zero and consequently we believe that the instruments are valid³⁰.

As controls in the *Institutions* equation we use exogenous variables such as the share of agriculture in state output and population density. In the *SDPPC* equation the controls include factors such as urbanisation and literacy rates, which might have an impact on SDP levels. Two other issues warrant some discussion. Given that factors such as resource endowments vary across states but not time and may be considered ‘state fixed effects’, it is also necessary to allow for possible ‘time effects’. We therefore include ‘year’ dummies to take into account any unobserved influences across time. Second, there might exist heteroskedasticity across some of the variables. In order to account for this we apply 3SLS to determine the robustness of the results³¹.

2.4.2. Results

The results in Tables 2 appear to strongly confirm the predictions of the model. The first and second columns in the table give the 2SLS result without the time effects. The first equation confirms survival probability interacted with resources leads to an increase in the pendency in judicial cases in the state – indicating poor institutional quality. The second equation shows a negative and significant association between pendency of cases and SDP per capita levels.

The second column uses the same specifications as the first, except that it includes the resource measure (*minesdp*) as an additional independent variable.

³⁰ The instrument list includes share of agriculture in SDP as our instrument for poverty, urbanisation, survival probability in elections, literacy rates, population density and the interaction between ‘survival probability’ and share of mining in SDP.

³¹ Phillips and Moon (1999) argue that in a pooled panel it does not matter if the panel has unit roots as long as the interest is in a long run relationship. Since institutions are believed to be a long-run phenomenon, a 2SLS estimate should suffice. However we also use 3SLS for robustness.

Columns 3 and 4 mirror columns 1 and 2, respectively, except that we use the initial level of resources (mines as a share of GDP in 1985) which eliminates possible endogeneity that arises from using contemporaneous measures of mineral resource shares. The key results remain unchanged. Column 5 replicates column 1 but adds the time effects dummy to the second equation (GDP per capita) to reduce omitted variable bias and column 6 replicates column 3 with time effects. While the time dummies are significant, there is no change in the signs or significance of the key variables. Moreover when either resource shares, or government survival probability are included as independent explanatory variables they are never found to be significant in any of the specifications.³² Thus, in so far as the empirical evidence permits the results indicate that mineral resources induce institutional erosion in states with low levels of political accountability. Weak institutions in turn result in lower levels of development.

The 3SLS results are presented in Table 3 and these underscores the main conclusion that the impact of resources on institutions and development is conditional upon the level of political competition. However, in these regressions resource shares and government survival probability, when included as independent explanatory variables are *marginally* significant. Thus we are unable to reject the possibility that resources and political competition may have additional effects that have not been considered in this chapter. However, the conflicting results and the low levels of significance might suggest that the impact is not statistically robust.

To determine the effect of resources on development outcomes, it is important to calculate the quantitative significance of these results. Formally the impact of

³² It must be noted that we cannot use all the three variables viz. political survivability, share of mines in GDP and (share of mines in GDP)*(political survivability), together because it leads to a singular matrix.

resources in the system is defined by: $\frac{\partial SDPPC}{\partial resource} = \frac{\partial SDPPC}{\partial institutions} \frac{\partial institutions}{\partial resource}$. Hence

we compute the two effects separately. In the *Institutions* equation, with a given level of survival probability, a one standard deviation increase in resource availability (minesdp), leads to an increase in case pendency of approximately 4.4 per cent³³. Similarly, in the *SDPPC* equation a one standard deviation increase in crime pendency, decreases SDP levels by Rs. 2,040. Combining these, a one standard deviation increase in resources (2.32 per cent) leads to a Rs. 930 decline in income levels. This would imply that a one standard deviation decline in resources in poorly performing state like Madhya Pradesh would lead to an 8.5 per cent rise in it's per capita income (SDP) level. Over time this would make a significant impact on overall development of this State.

2.5. Resource Curse and Growth

The empirical results presented thus far are consistent with Easterly and Levine's (2003) cross-country regressions, which suggest that endowments impact upon the level of per capita income through their effect on institutions. In addition our results show that the impact occurs through the interaction with political competition. However, the bulk of the resource curse literature focuses upon the effect of resources on economic growth, rather than the level of GDP (Sachs and Warner (1995), Isham *et al* (2003)). For completeness and comparison with this literature it is useful to investigate whether our key results spill over when the growth rate is used as the

³³ The impact is measured by taking the coefficient of the interaction variable – SURMINESDP (2.94) and multiplying it with the mean of the survival probability variable (0.64). This is done since we are looking at the marginal impact of just the resources. The resultant value of 1.88 is then multiplied with the standard deviation of MINESDP (2.32) to get our result of 4.4 per cent.

dependent variable.³⁴ Thus, for completeness, in a second exercise, we test whether resources and institutional quality have an impact upon the growth of per capita income in India (We replicate the Sachs and Warner (1995) exercise in Appendix A.2).

Following Sachs and Warner (1995), the dependent variable is the average rate of growth in state domestic product per capita (SDPPCAVGROG) for the period 1985 to 2000. Here too the measure of endowments is the share of the mining sector in the state domestic product of each State. This is interacted with the electoral competition variable described earlier to obtain a composite variable (SURMINESDP). Following Barro and Sala-I-Martin (1995), the initial level of income (INITIALSDPPC) is used to test for possible growth convergence. The other factors that can affect economic growth include labour quality, which we proxy by using literacy rates, population density, locational advantage is factored by a dummy variable accounting for the absence or presence of a port. Apart from these, the share of agriculture in the state domestic product, is used as proxy for the level of backwardness of a State³⁵. For consistency with the previous analysis we use the pendency rate as a measure of institutional quality.

Following the procedure previously employed, a 2SLS system of equation is used:

$$[Institutions]_{it} = \phi_0 + \phi_1[resources]_{it} * [political\ accountability]_{it} + \phi_2 X_{it} + u$$

$$[SDPPCAVGROG]_{it} = \gamma_0 + \gamma_1[institutions]_{it} + \gamma_2 Y_{it} + v$$

³⁴ Note that our model does not explicitly explain variances in growth, the motivation of the paper on Indian states is clearly growth based.

³⁵ Ravallion and Datt (1996) in the 'India Poverty Project: Poverty and Growth in India, 1951-94' of the World Bank claims that "...the relative failure of India's past industrialization strategy from the perspective of the poor points to the importance of successful transition to a strategy capable of absorbing more labour, particularly from rural areas." This suggests that poverty in India is a rural phenomenon.

The results given in Table 4 confirm that the main conclusions hold even when we study the impact on growth. In column 1, the interaction variable has a positive and significant coefficient, indicating that states with higher share of resources and high political survivability are likely to have more cases pending in the courts, implying poorer institutions. Here too the variables of the interaction term, when used independently as an explanatory variable are statistically insignificant (columns 1 (SURVIVCOMP) and 2 (MINESDP)).

In the second equation (dependent variable: SDPPCAVGROG), poorer institutions, reflected by higher case pendency, is strongly correlated with lower rates of growth. The other result of interest is that we also find that the initial level of SDP in 1985 is not significant, revealing that there is absence of convergence in the Indian states. This finding corroborates the results found by a number of other researchers (Bajpai and Sachs (1999), Rao, Shand and Kalirajan (1999)).

We repeat the exercise using initial level of resources (mines as a share of SDP in 1985) in columns 3 and 4. Here again we find the key results to be unchanged in signs and significance.

While the coefficients on resources, political competition and institutional quality have the correct signs and significance, it is useful to analyse the magnitude of these effects. Using the procedure described previously, for a given level of survival probability, a one standard deviation in resources would lead to an approximate 0.75 per cent decline in growth. This implies that a one standard deviation decline in resources in Madhya Pradesh would give it a growth performance equivalent to a growth success such as Punjab. Since growth effects are compounded over time this would make a significant impact on overall economic development levels in the long run.

The magnitudes involved are further indicated, using beta coefficients from our 2SLS estimation.³⁶ (Table 4, column 1). This reveals that the two key variables identified in the theoretical analysis - the institutional proxy (CRIMEDISP) and the resources- political competition interaction term (SURMINESDP) have the largest beta coefficients (0.92 and 0.44 respectively). This suggests that resources have played a significant role in shaping institutions and on development outcomes in India.

2.6. Conclusion

The diverging pattern of economic performance across the Indian states is known to be a consequence of policy differences. This chapter has attempted to identify some of the political economy factors that could influence the policy choices of state governments. The focus was on the potential influence of appropriable resource rents on development outcomes. Consistent with the most recent literature on the resource curse it is suggested that resource rents hinder development when fundamental institutions are weak. However, we extend this literature in an important direction by investigating the potential link between resources and institutional quality. The analysis suggests that the existence of high resource rents creates incentives to lower institutional quality since this facilitates rent appropriation. Ross (2001, page 3) characterises such behaviour as *rent seizing*, which he defines as efforts by state actors to dismantle institutions to gain the right to allocate rents (including to themselves). This chapter seeks to investigate the conditions under which institutional erosion (or rent seizing) will occur. It is suggested that resource

³⁶ We calculate the beta coefficients along the lines of Isham *et al* (2003) as the product of the coefficient (Table 4, Column 1) and its standard deviation (Table 1), divided by the standard deviation of the dependent variable (Table 1). The other Beta coefficients are: population density (0.39) and share of agriculture in 1985 (0.25).

rent driven institutional erosion is most likely to obtain if the level of political accountability is weak. This may explain why resource dependent countries such as Australia and Norway with strong institutions of political accountability have judiciously used their resource rents to promote economic growth, while undemocratic regimes such as Nigeria and Venezuela have not. Hence, appropriable rents lead to institutional erosion when there is a low level of political accountability. Weak institutions in turn result in a diminution in the quality and quantity, of government supplied goods and services and this hinders growth of the private sector. Thus, resource rich states trapped in these conditions exhibit lower levels of development. To our knowledge this result is new in the literature.

The empirical results based on data across the Indian states, provides strong support for the analytical predictions. The regressions show that resource induced institutional erosion and underdevelopment is conditional upon the level of political accountability. Moreover the results demonstrate that this conclusion holds for both level of development (i.e. GDP) and the growth rate of GDP, thus providing reasonable support for the analytical predictions.

The results in this chapter are also consistent with a large and rapidly expanding empirical literature in development economics, which shows that the black box of “good” institutions is typically correlated with superior development outcomes. However, these studies typically make no distinction between fundamental institutional structures such as political systems and other aspects of governance, such as the rule of law, and government effectiveness.³⁷ Our analysis suggests that these differences may be important. Unlike private agents, governments hold authority over institutions that might hinder rent appropriation. Hence they have an incentive to

weaken these institutions, unless restrained by electoral pressures. Unrepresentative political systems provide governments with greater latitude to reconfigure and weaken institutions in ways that serve their narrow interests. Weak institutional indicators (e.g. low government effectiveness) could therefore be a symptom of a deeper malaise (e.g. low political accountability), rather than a cause of development failures. The evidence provided in this chapter suggests that these are significant issues that warrant closer investigation in future research.

There are a number of other important issues that have not been considered in this chapter. While our analysis suggests that political accountability can limit the degree of institutional erosion, this outcome is not necessarily assured. First, as noted earlier, in a fractionalised electorate, non-economic issues such as religion or class may guide voting behaviour. This provides weak incentives for prudent resource management and governance. More significantly, even where voting behaviour is motivated by economic considerations, resource rents can be used to undermine electoral processes through vote buying, or to distort electoral outcomes by bribing legislators to switch sides after an election. For instance, Ross (2001) documents numerous cases in Sabah, Sarawak and the Philippines where tropical forests have been sacrificed to the altar of political patronage.

³⁷ For instance the World Bank publishes extensive data on the rule of law which measures the security of property rights, “voice and accountability” which captures the level of political and press freedom and “government effectiveness” which measures the efficiency of government service provision.

The importance of these issues in the Indian context is difficult to determine since there are laws that prevent politicians from changing their political allegiances.³⁸

These are issues that are left for future research.

³⁸ The Anti Defection Act as incorporated in the Tenth Schedule of the Constitution in 1985, empowers the Speaker or Chairman of the House concerned to decide on the question of disqualification of a member who defects. The defector invites disqualification if he or she voluntarily gives up membership of his party or abstains from voting in violation of any direction issued by the party. Independent members too invite disqualification if they join a political party. A split is recognised if at least one-third of the total membership of the legislature party defects. If more than two-thirds of the number of legislators of a party decide to join another party, it is recognised as a merger; in that case, the remaining legislators of the parent party will not be disqualified. However, the law in this form has failed to prevent bulk defections. This has been rectified in the Constitution Amendment Bill passed in 2003 which deletes the provision allowing one-third of a legislature party to split without attracting provisions of the anti-defection law.

Table 2.1: Descriptive Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum
crimedisp (%)	79.3	9.63	61.9	94.1
popnthousqkm ('00,000)	0.037	0.019	0.011	0.088
agrisdp (%)	30.39	8.5	12.4	45.8
survivcomp	0.64	0.1	0.44	1.0
surminsdp	1.49	1.44	0.004	4.59
sdppc (Rs.)	7734	4859	1739	23039
literacy (%)	56.3	11.9	34.7	89.9
urban (%)	25.6	8.3	10.5	42.8
minesdp (%)	2.37	2.32	0.01	7.74
initiaagrisdp (%)	32.02	8.62	17.88	45.8
initialsdppc (Rs.)	2901	748	1739	4443
sdppcavgrog (%)	12.3	1.56	9.2	14.5

1. crimedis: proportion of cases pending in state courts
2. popnthousqkm: population (in 100,000s) per square kilometres
3. agrisd: agriculture as a share of SDP
4. survivcomp: survival probability = (1-% of voters*%of votes for opposition)
5. surminsd: survivcomp*mining as a share of state domestic product (minesdp)
6. sdppc: sdp per capita
7. literacy: literacy rates
8. urban: proportion of urban area in a state
9. minesdp: mining as a share of state domestic product
10. initiaagrisdp: agriculture as a share of SDP in 1985
11. initialsdppc: sdppc in 1985
12. sdppcavgrog: sdppc average rate of growth (1985-2000)

Source: Planning Commission of India, Reserve Bank of India and Indian Ministry of Home Affairs and Author calculations

Table 2.2: 2SLS Estimation of the impact of ‘resource curse’ (current and initial levels) on SDP levels

Dependent Variable	Independent Variable	1	2	3	4	5	6
Percent of pending criminal cases (crimedisp)	Population density (popnthousqkm)	197.7** (6.06)	199.3** (6.05)	198.4** (6.06)	201.7** (5.99)	197.7** (6.03)	198.4** (6.05)
	Share of Agriculture in SDP (agrisdp)	-0.23** (-4.13)	-0.24** (-3.32)	-0.29** (-4.17)	-0.24** (-3.40)	-0.29** (-4.14)	-0.29** (-4.17)
	Survival probability for politicians (survivcomp)	10.77 (1.86)	--	10.88 (1.88)	--	10.77 (1.86)	10.88 (1.88)
	Share of mining in SDP (minesdp)	--	-3.37 (-1.94)	--	-3.42 (-1.92)	--	--
	Mines * survivcomp (surminsdp)	2.95** (6.58)	8.20** (2.95)	--	--	2.95** (6.58)	--
	Mines in 1985*survivcomp (surinitminesdp)	--	--	2.98** (6.64)	8.42** (2.90)	--	2.98** (6.64)
	No. of observations	225	225	225	225	225	225
	Adj R – square	0.20	0.20	0.20	0.19	0.20	0.20
SDP per capita (sdppc)	Percent of pending criminal cases (crimedisp)	-211.9** (-3.18)	-211.9** (-3.18)	-205.1** (-3.11)	-211.9** (-3.18)	-134** (-3.62)	-132** (-3.60)
	Literacy rates (literacy)	196.12** (6.39)	196.12** (6.39)	195.31** (6.42)	196.12** (6.39)	81.7** (4.54)	81.5** (4.55)
	Urbanisation (urban)	133.91** (3.04)	133.91** (3.04)	135.59** (3.10)	133.91** (3.04)	167** (6.78)	167** (6.82)
	Survival probability for politicians (survivcomp)	312.1 (0.10)	312.1 (0.10)	277.35 (0.09)	312.1 (0.10)	5784** (3.44)	5776** (3.45)
	Time Effects	No	No	No	No	Yes	Yes
	No. of observations	225	225	225	225	225	225
	Adj R – square	0.25	0.25	0.26	0.25	0.76	0.77

* significant at 5 per cent level

** significant at 1 per cent level

Figures in brackets are the T-ratios

Table 2.3: 3SLS Estimation of the impact of ‘resource curse’ (current and initial levels) on SDP levels

Dependent Variable	Independent Variable	1	2	3	4	5	6
Percent of pending criminal cases (crimedisp)	Population density (popnthousqkm)	195.0** (6.30)	195.2** (6.30)	196.8** (6.06)	194.4** (6.24)	184.5** (6.09)	186.0** (6.14)
	Share of Agriculture in SDP (agrisdp)	-0.39** (-5.98)	-0.34** (-5.09)	-0.39** (-4.17)	-0.34** (-5.04)	-0.37** (-5.75)	-0.37** (-5.79)
	Survival probability for politicians (survivcomp)	12.20* (2.14)	--	12.33* (2.16)	--	11.19* (1.96)	11.3* (1.98)
	Share of mining in SDP (minesdp)	--	-3.61* (-2.11)	--	-3.57* (-2.06)	--	--
	Mines * survivcomp (surminsdp)	2.63** (6.09)	8.25** (3.00)	--	--	2.80** (6.57)	--
	Mines in 1985*survivcomp (surinitminesdp)	--	--	2.69** (6.18)	8.20** (2.97)	--	2.86** (6.64)
	No. of observations	225	225	225	225	225	225
Adj R – square	0.19	0.20	0.20	0.17	0.20	0.20	
SDP per capita (sdppc)	Percent of pending criminal cases (crimedisp)	-215.9** (-3.36)	-212.9** (-3.31)	-208.2** (-3.28)	-204.4** (-3.20)	-141** (-4.14)	-138** (-4.10)
	Literacy rates (literacy)	215.98** (8.10)	213.86** (8.08)	214.38** (8.04)	210.71** (7.94)	94.2** (6.62)	93.6** (6.58)
	Urbanisation (urban)	141.25** (3.56)	145.73** (3.69)	141.28** (3.58)	147.08** (3.72)	166** (8.20)	166** (8.20)
	Survival probability for politicians (survivcomp)	873.3 (0.30)	721.7 (0.26)	827.92 (0.29)	544.2 (0.10)	5942** (3.82)	5931** (3.83)
	Time Effects	No	No	No	No	Yes	Yes
	No. of observations	225	225	225	225	225	225
	Adj R – square	0.23	0.24	0.25	0.25	0.76	0.76

* significant at 5 per cent level

** significant at 1 per cent level

Figures in brackets are the T-ratios

Table 2.4: 2SLS Estimation of the impact of ‘resource curse’ through institutions on Economic Growth

Dependent Variable	Independent Variable	1	2	3	4
Proportion of Cases Pending in Courts (Crimedisp)	Population Density (popnthousqkm)	197.75** (6.03)	189.85** (5.78)	198.42** (6.06)	191.1** (5.85)
	Share of Agriculture in SDP in 1985 (initiagrisdp)	-0.29** (-4.13)	-0.25** (-3.54)	-0.29** (-4.17)	-0.25** (-3.50)
	Share of Mines in SDP *survival probability (surminesdp)	2.95** (6.59)	5.67* (2.06)	--	--
	Share of Mines in SDP in 1985*survival probability (surinitminesdp)	--	--	2.98** (6.63)	6.24* (2.27)
	Survival probability (survivcomp)	10.77 (1.86)	--	10.89 (1.88)	--
	Share of mines in SDP (minesdp)	--	-1.77 (-1.03)	--	-2.12 (-1.23)
	No. of Observations	225	225	225	225
	Adj R-Square	0.20	0.21	0.21	0.20
Average Growth of Per Capita SDP (sdppcrog)	Proportion of Cases Pending in Courts (Crimedisp)	-0.15** (-4.34)	-0.16** (-4.35)	-0.16** (-4.34)	-0.16** (-4.34)
	Literacy rates (literacy)	0.01 (0.46)	0.01 (0.46)	0.01 (0.46)	0.001 (0.46)
	SDP Per Capita in 1985 (initialsdppc)	0.001 (1.64)	0.001 (1.64)	0.001 (1.64)	0.001 (1.64)
	Presence of Port (port)	2.29** (3.87)	2.29** (3.87)	2.30** (3.86)	2.30** (3.86)
	Urbanisation (urban)	0.62 (0.92)	0.62 (0.92)	0.61 (0.90)	0.61 (0.90)
	No. of Observations	225	225	225	225
	Adj R-Square	0.33	0.33	0.32	0.32

* significant at 5 per cent level

** significant at 1 per cent level

Figures in brackets are the T-ratios

3. Fiscal Federalism in India: Exploring the Budgetary Implications of Political Alignment and Institutional Quality

3.1. Introduction

In a federal structure that comprises various tiers of governments, distributive politics is generally considered a significant contributory factor to the overall inefficiency in fiscal management (see the seminal work in this area by Dixit and Londregan, 1998). Broadly speaking, the recent analytical literature considers the federal structure to be one where there is strategic bargaining between the centre and the states or regions. In this set up, the interaction between the centre and states is modelled as a simple static game in which the fortunes of political parties depend upon their performances at both tiers of government. Political alignment may also play a role in determining the level of expenditures because of the “soft budget constraint” argument. If political affiliations exist between the central and state governments, it would be difficult for the former to credibly adhere to a “no bail-out” commitment. The desire of the states to opt for a central government bail out stems from the “common pool” argument. This suggests that fiscal imprudence occurs if the gains from higher expenditure are localized, but the burden is to be shared across regions if the central government finances this additional expenditure. Thus, a state government that is “friendly” to the central government may be relatively more fiscally profligate as there may be a higher chance of it benefiting from increased transfers from the central government (Jones *et al.*, 2000).

The other key aspect of fiscal management in a federal structure that needs to be paid more attention to is the role of fiscal institutional setup at the state level. Institutions can be broadly defined as the set of procedures, rules and policies that feed into the formulation, implementation and management of budgetary policies (Jones *et al.*, (2000)). The role of institutions is to formalize the contracts between various groups in a society so

as to further economic development (Tanzi, (2000)). Hence, it may be reasonably asserted that high-quality institutions lay the groundwork for better fiscal management. For instance, Alesina, *et al.* (1996) argue that differences in institutional set-up may account for variations in cross-country fiscal experiences even among economically homogenous groups of countries. To our knowledge, no other study has empirically examined the role of fiscal institutions on the budgetary performance at the state level in India.

This chapter attempts to analyse the linkages between politics, institutions and governance under a federal structure in India. Our work builds upon previous studies on the effect of politics on fiscal management and transfers at the state level. We are specifically concerned here with how discretionary transfers might affect fiscal management at the state level, and not the possibility that the “design” itself might be subverted due to political influence¹. We refer to fiscal management as the process governing the deficit levels achieved by the state governments.

There are mainly two modes of transfer from the centre to the states in India. One is the Planning Commission which is primarily concerned with “plan transfers” such as loans and grants. The other is the Finance Commission transfers which include shareable taxes and grants. These two institutions account for around 80 per cent of the transfers to the states. Both these transfers are formula-based². The balance might be considered discretionary transfers³. Hence, any analysis of political influence on transfers must

¹ There have been a number of studies which explicitly analyse the design of intergovernmental transfers (for instance, see Bird and Smart, 2002).

² The *Planning Commission transfers* depend on the population base, the deviation in per capita income, tax effort and overall fiscal management, national objectives, and special problems. The *Finance Commission transfers*, which are primarily concerned with tax sharing and grants, usually vary their sharing formula every five years. However, the criteria broadly include population size, deviation of per capita income, income level and poverty level.

³ We consider discretionary loans from the centre to be a form of bailout for two reasons. One, it does not impose upon the states to remedy its finances in anyway, which they would have had to, were they to raise the loans from the market. Two, by advancing the loans, the central government

control for the predetermined components of the transfers. Studies have thus far concentrated on the non-debt transfers in an attempt to unearth any possible political biases in transfers. An important component that has often been overlooked is the loans from the centre which may be extended to favored states but are eventually written off if the state finds it impossible to repay them. Alternatively, these might be considered as loans in perpetuity.

So in effect we will analyse two sets of impacts on state finances. First is an assessment from the expenditure end, wherein, we look at the impact of fiscal institutions and politics on the revenue deficit. The second is an assessment from the resource side, wherein we study the impact of fiscal institutions and politics on fund transfers from the Centre.

The remainder of the chapter is organized as follows. Section 3.2 outlines a simple review of literature and the state level political setup in India. Section 3.3 details the raw data and develops appropriate institutional and political indices to be used in the empirical section. We use pooled data on 15 major state governments for the period between 1985 and 2000. As is apparent from Table 1, the 15 Indian states exhibit significant diversity, with the largest being Uttar Pradesh (population 174.5 million in 2001), and the smallest Haryana⁴ (population 21.1 million in 2001). The states also exhibit considerable variation in terms of national income, with Punjab, the richest state, enjoying an average GDP per capita in 1999-2000 of about four times that of the poorest state, Bihar. Section 3.4 outlines the working models and various hypotheses to be tested, while Section 3.5 discusses the results. Section 3.6 offers a summary and a few concluding observations.

implicitly acts as a guarantor of these liabilities, thereby absolving the States of any need to maintain fiscal prudence.

⁴ The census in India is held every ten years. The latest one was in 2001. The population for each of the states in the other years was determined by using the compounded annual growth between the periods 1981-1991 and 1991-2001.

3.2. Literature Review

The Indian administrative and political set up as at the end of 2000 consisted of 25 State Governments and 7 Central Controlled territories⁵. On the political side, India has a parliamentary democracy with elections based on proportional representation. The Indian political system does not assign any limit to the number of parties at the National or Regional level – it only assigns a criteria – based on factors like proportion of votes garnered, presence across the country, length of existence etc. Usually, a party that has a presence in at least four states is referred to as a national party, while regional parties are usually a dominant power in one State. Since the 1980s, the dominance of a single party in India has begun to erode, so it is usually the case that national parties form a pre or post poll alliance with regional parties. The number of members of parliament at the Central level has been increasing overtime and currently stands at 545. As at end of the year 2000 Uttar Pradesh was the most important state politically at the Central level by virtue of electing 85 Members of Parliament. At the regional level the States are divided into smaller constituencies based on both area and population.

The Constitution of India had institutionalised the asymmetry of powers between the Centre and the States both in legislative and financial terms by providing greater powers to the Central government. However, over the period of the 1980s and the 1990s, there has been a gradual transfer of powers to the regional governments, but the financial asymmetry is stark. Such vertical equity issues are targeted through Central Transfers. The issue we wish to analyse in greater detail is to understand, if political affiliations could insert an element of bias to these transfers. In the Indian context, which has a federal

⁵ In 2001 three more States viz. Uttaranchal, Jharkhand and Chhatisgarh, were carved out of the existing States, to take their numbers to 28.

structure, the States have experienced different levels of growth, as well as varied fiscal performance. The explanation for such events could lie in factors other than purely economic ones.

The State legislative assemblies had played an extremely limited role in the formulation and enactment of legislation in the early days of independence, given the preponderance of the central government to micro-manage development policy (Brass 1994), The rise of the regional parties has coincided with the demise of the single party hold over the Indian central government. The political dependence of the central government on regional governments has led to economic ramifications in the Indian federal context. To understand the nature of shift in the power base one must first consider the Indian central level politics. From single party dominance, overtime the government transformed into a minority government and subsequently a coalition government at the central level⁶. It must be stressed here that the emergence of a minority government at the Central level meant that the Centre would not have been strong enough to resist pressure for fiscal accommodation from the State. The need-based support of the Central Government might have led it to extend *quid pro quo* fiscal benefits to the States.

Paul Brass (1994) divides the state level party systems into four groups based on the major political players and the structure of competition among them. These are – competitive two party systems, where the major players are the INC and the BJP. This group includes three North Indian States of Rajasthan, Madhya Pradesh and the relatively minor State of Himachal Pradesh and the western state of Maharashtra. The second group

⁶ When India became independent in 1947, one party – The Indian National Congress (INC), dominated the political landscape. This domination was gradually reduced overtime with the advent of other players. It was only towards the late 1980s that the overarching presence of the INC started to diminish significantly. In 1989, a coalition of opposition parties formed a government at the Central level. However, this government did not last for more than 2 years. 1991 to 1996 saw an INC led minority government drawing on ‘issue based support’ from a group of regional. The 1996 elections led to the formation of another coalition come to power. This government too lasted for merely two years, before elections in 1998 led to another coalition government this time led by the ‘Bharatiya Janata Party’ (BJP) which lasted for 13 months, and the next election in 1999 also led to the formation of a BJP led coalition.

may be classified as a Competitive Multi Party System, which usually has three major players – the INC, BJP and the Janata Parties. This comprises broadly the six major States of Bihar, Uttar Pradesh, Harayana, Gujarat, Karnataka and Orissa. The third group is similar to group 1, except that the two major parties are the INC and the Communist Party (CPM). This includes the two states of West Bengal and Kerala. The fourth group consists of States that are dominated by regional parties. The major states in this group include Tamil Nadu, Andhra Pradesh, Punjab and Assam. The regional parties usually form alliances with the National Parties and one may reasonably expect that they might bargain for increased fiscal assistance for their states in return for assured support.

The volatile political scenario in India, in the 1990s, made it difficult to track the alliances, particularly when certain parties kept switching allies. Our method of considering alignment is both explicit – when the party at the State level is a formal member of the coalition at the Centre and implicit, where the party at the State level provides support to the Central Government even though it is not a member of the government. We consider implicit coalitions as a form of alignment, particularly in the light of minority governments, where outside support is crucial for the existence of a government.

At the State level, the emergence of alternatives to INC began from 1967 with the ‘Congress loss of power mostly to unstable non-Congress coalitions in half the Indian States’ (Brass (1994)). This is further evidenced in our sample, where not a single State has an unbroken rule by an INC government. On the other hand 2 states have continuously had non-congress governments. However, it must be borne in mind that the INC still commands a significant percentage of votes and has been either the government or the principal opposition in most of the Indian States.

That politics subsumes centre-state transfers has generally found consensus with economists, even though there has been relatively few empirical work in this area. Dixit and Londregan's (1998) seminal work on politics influencing redistributive policies in a federal set up has analysed this issue at a theoretical level.

Several authors have dealt with the interplays between politics and economics, but not enough attention has been paid to the Indian context. The 'partisan' model which analyses the effect of politics on economic decision making has been used by authors such as Alesina and Sachs (1988), Cox and McCubbins (1986, 1992) at a Central level. Alt and Lowry (1994) extended the analysis of political alignment to the second tier of government viz. the State level, as well as incorporated the role of institutions in the management of government finances. Jones, *et al* (2000) suggest that a federal government is a multi player game, where the players are politicians who are only interested in getting re-elected and therefore have an incentive to provide benefits only to their own constituencies without incurring the concomitant costs or at most incurring only a partial cost. Thus over utilisation of a 'common pool' of resources ought to be a dominant strategy for each of these players, given that the citizens suffer from fiscal myopia and are unable to see the future costs or at any rate be willing to blame their own politicians for any fiscal malaise.

In a federal economy, comprising various tiers of governments, distributive politics is a factor that determined the level of inefficiency that entered into the fiscal space. This was contingent upon whether or not a central government can accommodate the dilution of fiscal prudence by a state government. It is possible that when a "friendly" government is in power at the State level they can ensure higher ad hoc transfers from the Centre, primarily by leveraging the fact that being the second tier of government they are in a better position to influence voter decision. One way for the Centre to counter this

effect of the States is through the direct influence it wields at the regional level. This is influenced by the number of members of parliament (at the Central level) that a ruling party has from a given State. Thus this is the ‘power’ that the Centre enjoys over a state government to promote the central government’s agenda. In that sense the relationship between a Central Government and a state government might even be considered antagonistic.

There have been only a handful of empirical studies on the politics of redistribution in the Indian context.

Dutta (1996) deals with the presence of coalition governments at the state level and its underlying effects on fiscal policies. He does not specifically address the issue of transfers from the centre to states. He concludes that unstable coalitions are more likely to be fiscally imprudent because of myopic policies.

Rao and Singh (2001) demarcate the transfers from the centre into shareable taxes, non-plan grants and grants for state plan schemes, grants for central plan and sponsored schemes⁷. The authors estimate a model using data for 14 Indian states for the period 1983 to 1993, with the dependent variables being statutory transfers (consisting of shareable taxes and non-plan grants), grants for state plans and discretionary transfers (central and state plan grants). The control variables are state gross domestic product (SDP), SDP per capita, population, and two variables for “power” -- the proportion of ruling party Members of Parliament (MPs) in a particular state, and a dummy variable for “alignment”, representing whether the same party was in power at the state and centre. Their results are mixed at best; they obtain positive and statistically significant results for the alignment variable on grants to state plans with a lag and a positive result for the

⁷ The demarcation of resources into “plan” and “non-plan” is a bit simplistic and misleading, as the latter seems to give the impression of some form of ad hoc transfers. On the contrary, non-plan grants are usually statutory grants determined by the Finance Commission.

power variable on statutory transfers. However, the key issue of whether discretionary transfers were made by the centre to politically aligned states was not satisfactorily resolved.

Dasgupta, *et al.* (2001) analyse data for the period 1968-1996 to test the hypothesis based on the Dixit-Londregan model, viz. that central governments are opportunistic and provide increased grants to states on the basis of “alignment” and a “swing” variable. The former controls for political affiliations between the centre and states, while the latter depicts the level of political competition, defined as the closeness of the ruling party to achieving 50 per cent of the seats. Their results appear to be consistent with the priors of the Dixit-Londregan (1998) model.

Khemani (2002) analyses the impact of political affiliation on transfers in India for the period 1972 to 1995 and concludes that political considerations influence the level of grants. According to the author, contrary to the popular premise, the design of intergovernmental transfers is such that it provides incentives for lower deficits. The author does not find any evidence to suggest that the design of the inter-governmental transfers is such that it rewards fiscal profligacy. Rather, greater transfers appear to be correlated with lower deficits.

3.3. Data and Definitions

3.3.1. Some Preliminaries

To summarise, the Indian political setup as at the end of 2000 consisted of twenty-five state governments and seven central controlled territories. The Constitution of India had institutionalized the asymmetry of powers between the centre and the states both in legislative and financial terms by providing greater powers to the central government.

On the political side, India has a functioning parliamentary democracy with elections based on proportional representation. The Indian political system does not assign any limit to the number of parties at the national or state level. It only assigns a criteria based on factors like proportion of votes garnered, presence across the country, length of existence, etc. Usually a party that has a presence in at least four states is referred to as a national party, while regional parties are usually a dominant power in one state.

As enumerated earlier, the dominance of a single party in India has rapidly eroded since the 1980s, so it is usually the case that national parties form a pre or post poll alliance with regional parties. The number of MPs at the centre currently stands at 545. Population is the only factor that decides the number of central representatives from a State⁸. At the state level the states are divided into smaller constituencies based on both geographical area and population.

Our analysis, based on the time period between 1985 and 2000 is important because it is in the latter half of 1980s that the Indian states started experiencing budgets deficit, primarily on account of sharp increases in expenditure (Table 3.2; also see Rao, (2002)). The revenue expenditures increased by 16.3 percent during 1985-90 and further by 15.8 per cent on average during the 1990s. The latter half of the 1980s and the 1990s was also a period of significant political flux in the Indian Union. This period saw as many as six elections at the central level. The number of times there was a change in the government during the period 1985-2000 at the state level varied between four for Uttar Pradesh and none for West Bengal.

Our analysis will deal with pooled data from 15 major Indian states that account for over 90 per cent of the gross domestic product (GDP) and almost 95 per cent of the

⁸ This is done so as to keep the ratio of representation per person roughly the same. This also follows the principle of equity in a parliamentary democracy, where the vote of each person is valued equally under the Constitution.

population (Table 3.1). We have two broad types of data. The first set is the officially reported data on various key economic indicators. As noted earlier, our interest lies in analyzing the effects of various political and institutional processes on the state level fiscal management. To capture these effects we have constructed a set of indices, which we elaborate upon in some detail below (also refer to Tables 3.4 and 3.5).

3.3.2. Data Description

We briefly describe the official data employed in the chapter (Table 3.3). The revenue deficit per capita ($rdpc_{it}$) refers to the excess of revenue (current) expenditures over current revenue receipts normalised by the population of each state. This is an indicator of the short-term fiscal stress being faced by a state government.

The ($sdptfc_{it}$) refers to the domestic output of each state government, measured at factor cost. The census of India is held every ten years, the last three census being undertaken in 1981, 1991 and 2001. The annual population levels ($popnt_{it}$) in each of the states under consideration have been calculated using the compound rates of growth between 1981 and 1991 and between 1991 and 2001.

The change in rate of growth of state domestic product ($sdptfc_{it}$) has been calculated to give us the data for ($sdptchrog_{it}$). The gross transfers from the Centre ($gtrt_{it}$) are calculated as the sum of loans from centre, shareable taxes and grants from the centre.

Fiscal deficit as a proportion of state output ($gfdsdp_{it}$) measures the level of fiscal stress being faced by the regional government. Two other indicators of backwardness that we have used are: distance ($dist_{it}$), calculated as the difference between state i in time t

and the richest state in terms of per capita domestic product, and the proportion of people below the poverty line ($poverty_{it}$)

3.3.3. *Indices of Budgetary Management*

The government budgetary process is a complicated endeavor involving many players like the government, specific ministries, legislators and the implementing bureaucrats. This gives rise to a situation which in many cases might lead to a conflict of interest, with some entities seeking an expansion of the budget and others a curtailment. It is here that the role of institutions becomes paramount since they determine the rules of the game between agents (Alesina, *et al.*, 1996). We therefore need to create a measure of fiscal management that in some way covers the issues pertaining to their effectiveness in maintaining fiscal probity.

Following the novel papers by von Hagen (1992), Alesina, *et al.* (1996) and Jones, *et al.* (2000), we attempt to develop an index of fiscal management in order to assess their impact on fiscal management. We develop the index in the Indian context on the basis of constitutional provisions and reforms undertaken by the state governments or its entities over the 1990s. We note that this index includes components that constitute all or some of the institution as identified in the theoretical literature.

a) *Fiscal Responsibility:* The lack of constitutional limits to expenditure overruns is a major reason for fiscal profligacy. At the state level in India, it is the finance minister of the ruling party that presents the budget which has to be passed by the legislature through a simple majority. The centre can do little to directly influence the budgetary process at the state level. A further peculiarity -- some would say, weakness -- of the Indian fiscal system is that it allows the state governments to *ex-ante* present a deficit budget, with the

proviso that the deficit be bridged through additional resource mobilization or borrowings. It is usually the case that the states take recourse to the latter as it is a less contentious method than attempting to raise resources via taxation.

Given this scenario, 10 points are assigned if the state enacted laws which prevented it from running a deficit and prescribed a certain acceptable limit to its debt to state domestic product (SDP) ratio. None of the Indian states have adopted this policy. Some states like Andhra Pradesh, Punjab and Uttar Pradesh had in place a “Medium Term Fiscal Policy” which have recognized the problem of a burgeoning deficit and envisaged a gradual reduction in debt and deficit over the medium term. Such states have been assigned 2.5 points, along with states like Bihar and Maharashtra which have announced an effort to reprioritize their expenditures annually through “zero based budgeting”. Only two Indian states, viz. Karnataka and Haryana have announced an intention to enact a fiscal responsibility bill along with a medium term fiscal policy. These states have been assigned 5 points. It must be borne in mind that this component primarily straddles the first two types of budget institutions. Well-enshrined fiscal accountability ought to have a salutary effect on fiscal management.

b) Provincial Borrowing Ability: Until the early 1990s, market borrowing at the sub-national level was conducted entirely by the central government through the Reserve Bank of India (RBI). The RBI, in consultation with the central government, determined the total amount of market borrowing to be made on behalf of the states. This was done over two or three tranches, and each state was expected to pay the same interest rate. By the mid 1990s it was decided that states would be encouraged to undertake a part of their market borrowings independently as a means of imposing market discipline. We have assigned a value to this indicator on the basis of the ability of the states to manage debt. The highest

value of 10 was assigned to Andhra Pradesh and Maharashtra, which have undertaken the market borrowing exercise independently and have also set up a consolidated sinking fund to manage the repayments of such borrowings. States like Gujarat, Karnataka, Kerala or Tamil Nadu that have implemented at least one of the two innovations on the borrowing front have been assigned 7.5 points. All the states that continue to depend on the RBI for their market borrowings have been assigned 5 points. This component addresses the issue of transparency, as we believe that a market-based approach to borrowings would mean a closer scrutiny of the state budgets and therefore a need for greater transparency.

c) Municipal Borrowing Ability: The Indian constitution has tried to encourage a degree of decentralization through the adoption of the 73rd and 74th constitutional amendment pertaining to rural and urban local governments. In this respect, while the rural governments do not have any independent borrowing powers, some urban co-operatives of some states have been granted the power to raise resources from the market. One can expect that there would be a direct causal link between the finances of a state and whether it permits an urban co-operative body to raise resources from the market. States like Andhra Pradesh, Gujarat, Maharashtra, Karnataka and Punjab have been assigned 10 points for having allowed the municipalities of some of their major cities to raise funds by issuing municipal bonds.

d) Public Sector Investment Policy: At the state level, the largest investments have been in the State Electricity Boards (SEBs). We use the investment returns of the SEBs as proxies for the entire state level undertakings. At the time when India opted for a public sector led growth, it was suggested that a 3 per cent return on investment would be “adequate” for the public sector. However, this target has been consistently missed and

the power sector suffers from persistent losses. The financial performance of state public sector undertakings is closely related to the amount of budgetary support required by them from the state government, and in turn affects the fiscal position of the state government.

We assign values to the states for this indicator on the basis of the average return on investment for the SEBs during the period 1992 to 2000. The average for these 15 states is then calculated, which is identified as the mean return and assigned 5 points. If the return is higher than 1 standard deviation, the state gets 7.5 points, while 10 points are assigned if the return is 2 standard deviations higher than the average all-state return. Similarly, states with 1 and 2 standard deviation lower than the average return, and assigned 2.5 points and 0 points, respectively for this indicator. As expected, the extremely poor performances of the SEBs ensure that no state gets 10 points for this indicator. States that are assigned 7.5 include Maharashtra, Karnataka and Tamil Nadu. 5 points are assigned to states like Gujarat, Haryana, Kerala, Orissa, Rajasthan and Uttar Pradesh and 2.5 points to Andhra Pradesh, Bihar, Punjab and Madhya Pradesh. Finally, Assam and West Bengal end up with 0 points for this indicator.

e) *Contingent Liabilities:* A number of states have been extending guarantees to loans undertaken by state government undertakings. The outstanding state guarantees as a ratio to GDP was approximately 4.7 per cent of GDP. Any default on these guarantees would have serious consequences for the already over-burdened state finances. Another important dimension of state guarantees, which has implications for the sustainability of state finances, is the quality of guaranteed loans and the element of risk associated with such guarantees. Furthermore, excessive guarantees discourage proper credit risk assessment by the financial institutions and hence posing a moral hazard problem for them. We have assigned 10 points to those states which have explicitly passed a bill

imposing ceiling on the level of guarantees. These include the states of Assam, Gujarat, Karnataka, Rajasthan and West Bengal. The other states have been assigned 5 points each.

f) *The Overall Fiscal Management Index:* This index is constructed by summing up the points received by each of the states for the six indicators. All the indicators sum up to 50 points. The value of the index varies between a maximum of 40 points and a minimum of 20 points (Table 3.4).

3.3.4. *Political Indices*

We now introduce several political variables (Table 3.5).

a) *Political Alignment:* The first political variable that we are interested in is that of “political alignment”. One of the key features of our analysis is to understand whether political affiliations at the state level vis-à-vis the centre would affect fiscal performance. According to conventional wisdom, since a substantial part of resources at the state level comes from the centre by way of transfers, the party in power at the centre may provide preferential treatment to those states which have the same party in the government. Hence, a “friendly” government at the state has a relatively greater incentive towards fiscal laxity because they credibly believe that their fiscal impropriety would be condoned by the central government through higher ad hoc transfers. Conversely, an “unfriendly” government at the state level can expect no such favors. Jones *et al* (2000) have recently suggested that under a federal structure, where the leader of the central government is primarily held responsible for the economic performance of a nation, the leader of the party in power at the centre might use her influence to ensure “fiscal conservatism” in the states where the same party is in power.

Thus, the fiscal impact of political alignment is theoretically ambiguous and is an empirical issue. We test this in the Indian context using the alignment variable. For each of the states under consideration we code the years where a party was singly or as a member of coalition in power both at the centre and at the states as 1, else it is coded as 0. The period 1984-2000 saw six central elections in 1984, 1989, 1991, 1996, 1998 and 1999.

b) Nature of Government: The second political variable pertains to the type of government that was in power at each state in India during the period 1985-2000. Some states like Tamil Nadu and Andhra Pradesh are dominated by regional parties, while others like Madhya Pradesh and Karnataka by national parties. In addition, states like West Bengal and Kerala have coalition governments. At times, states like Uttar Pradesh and Bihar have had to form minority governments as well.

Thus, if we need to investigate the effect of multi-party or coalition governments on state level expenditures we require an index of political structure. We construct an index along the lines of Roubini and Sachs (1989). This index, denoted as pol_{it} (for state i at time t), measures the level of cohesion in the state government. The index is constructed as follows:

Value 0 is assigned to a state (i) having a one party simple majority government during year (t).

Value 1 is assigned to a state (i) having two coalition partners in government during year (t).

Value 2 is assigned to a state (i) having three or more coalition partners in government during year (t).

Value 3 is assigned to a state (*i*) having a minority parliamentary government during year (*t*).

We test the proposition that coalition governments have a greater proclivity towards fiscal mismanagement compared to single party governments. Roubini and Sachs (1989) claim that each of the coalition partners in a government might have their own distinctive agenda and constituencies. The lack of uniformity in the objective functions of the parties concerned might render the government incapable of lowering its expenditure. In a sense, there is a kind of prisoner's dilemma being played with respect to lowering expenditures. In the absence of some form of compromise between the coalition partners to get to a "cooperative" outcome, the "non-cooperative" result is more likely to arise.

The political scenario in the Indian states has undergone a gradual transformation over time. The states were initially characterized by single party governments. However, this condition has gradually changed, with a number of states in the Indian union having coalition or minority governments. In our dataset for 15 states for the period 1985 to 2000 we have 225 state years. Of this, the states have been governed by some form of coalition governments 82 years or 36 per cent of the time.

c) Electoral Competition: Another potentially significant factor contributing to the size of bailouts is the degree of electoral competition. A highly competitive region might be wooed more strongly by the incumbent party at the centre via fiscal inducements. The alternative hypothesis is that a highly electorally competitive region would not be given preferential treatment by the central government since there are many non-economic factors which decides the way an electorate votes. Thus, rather than expend resources on a region where there is no assurance of a return, it might be better for the incumbent

government to spend resources in consolidating those regions where it is already in power comfortably.

We try to capture this electoral competition effect through the interaction of two terms. The first is the proportion of eligible voters that did not vote for the ruling party (a measure of constraint on the executive) at the state level, and the second is the proportion of eligible voters who exercised their right to vote (a measure of competitiveness of political participation). This is an adaptation of two indices - the Marshall and Jaggers (2003) polity index which is a measure of democratic and autocratic attributes in a country⁹ and the Vanhanen (2000) index of democracy, which focuses on political participation and political competition.

3.3.5. The Impact of the Central Government (Power)

A notable feature of countries with federal systems is the coexistence of alternative power structures which tend to be hierarchical in nature. Thus, there is a need to measure the extent to which a higher level government can influence the action of the lower level of the government. We try to capture this in the Indian context in a way suggested by Rao and Singh (2001). In particular, we measure the proportion of ruling party MPs out of the total number of MPs from each state¹⁰. We believe that the ruling party MPs can play a role in influencing the quantum of discretionary transfers to a region by virtue of being closer to the power structure at the centre,.

⁹ Since India is a fairly well functioning democracy, we are only interested in the democratic attributes, which include competitiveness of political participation, openness of executive recruitment, competitiveness of executive recruitment, and constraints on the executive.

¹⁰ We refer only to the lower house of Parliament or the Lok Sabha. Population is the only determinant of MPs from a particular state.

3.4. Working Models and Hypotheses

Based on the foregoing analysis we test two working models to evaluate two indicators of fiscal performance at the state, viz. the per capita revenue deficit and the total gross transfer from the central government to each individual state i at time t . In addition to key explanatory variables discussed earlier, we also include a number of control variables.

3.4.1. Revenue Deficit

We are more interested in the revenue component of the deficit than the overall or gross fiscal deficit because political uncertainty would arguably have a more immediate effect on revenue expenditures rather than capital expenditures¹¹. Another reason for focusing on revenue deficits rather than aggregate deficits is that the latter usually includes loans given for central/state schemes. So, in a sense, part of these expenditures is tied to central plans and consequently cannot be altered by the state government¹².

Based on early analyses, the first basic model to be tested can be expressed as follows:

$$rdpc_{it} = \alpha_1 + \sum_{k=0} \beta_k \log(sdppc_{i(t-k)}) + \sum_{k=0} \delta_k \log(popnt_{i(t-k)}) + \sum_{k=0} \gamma_k sdpchrog_{i(t-k)} + \sum_{k=0} \phi_k (rdpc_{i(t-k)}) \\ + \alpha_2 (align) + \alpha_3 (align_{it}) * (power) + \alpha_4 (align_{it}) * (elcomp) + \alpha_5 * (budins_i)$$

¹¹ Note that the Indian government budget documents divides the government accounts into three components. *Revenue Deficit* is defined as the difference between revenue expenditures and revenue receipts. *Overall Deficit* is defined as the difference between aggregate receipts and aggregate disbursements. *Gross Fiscal Deficit* is a broader concept, defined as difference between aggregate disbursements net of debt repayments, and recovery of loans, revenue receipt and non-debt capital receipts.

¹² Admittedly, there exists the possibility that a state government might undertake substantial borrowings to finance capital projects and leave the debt burden for future governments. This aspect needs to be investigated further. The government of India itself focuses largely on the revenue deficit, as apparent by the recent passage of the Fiscal Responsibility Bill, by the lower house of the Indian Parliament in May 2002. The bill seeks to put a legislative mandate on the Government to eliminate revenue deficit by 2007-08.

$$+ \alpha_6 * (pol_{it}) + \alpha_7 * (power_{it}) + \alpha_8 * (elcomp_{it}) + \alpha_9 * (fifthpay) + \varepsilon \quad (3.1)$$

where: $rdpc_{it}$ is the per capita revenue deficit of state i at time (t) ; $sdppc_{i(t-k)}$ is the per capita domestic product of state i at constant price at lagged $(t-k)$ period; $popnt_{i(t-k)}$ is the population of state i lagged $(t-k)$ period; $sdpchrog_{i(t-k)}$ is the change in the rate of growth of state domestic product; and $budins_i$ is the budgetary institution index for state i . This basic model is subsequently incorporated with other fixed effect political variables, viz. the nature of government (pol_{it}), political alignment ($align_{it}$), $power$, electoral competition ($elcomp$), and a number of interaction variables ($(align_{it}) * (power)$ and $(align_{it}) * (elcomp)$) to assess the impact of each of the variables on government deficit. ($fifthpay$) is a dummy variable to capture the effects of the rise in government salaries following the acceptance of the ‘Fifth Pay Commission’ awards by the Government of India. α_1 and ε_t are a constant term and an error term, respectively.

The *a priori* expected signs of the coefficients in our equation above are ambiguous. Why? The coefficient sign of the state domestic product per capita ($sdppc$) can either be positive or negative, since the output of a State would be closely related to its income and consequently its expenditure and deficit. The sign of the ($popnt$) can also be either positive or negative as a larger population translates not only into higher expenditures but also higher revenues. The lagged revenue deficit ($rdpc_{i(t-k)}$) could also be positive or a negative coefficient. If it is a negative, one can argue that the deficit of last period leads to a more prudent policy this period. Alternatively, if positive, it implies that the state government can sustain a deficit revenue for more than one period.

For the institutional effects, we use the statewise fiscal institutional index ($budins$). Subsequently, we introduce two other political variables to analyse the effects of coalition

governments (*pol*) and political alignment (*align*). The expected signs for their coefficients are elaborated in hypotheses 1 to 3 below.

Hypothesis 1: States with higher values on the Budgetary Management index would have lower expenditures. The budgetary management index ($budins_i$) underscores the importance of the development of sound and accountable practices for fiscal management. A well-functioning institutional set up can be instrumental in ensuring that political biases cannot subvert the systems and procedures that are in place to oversee fiscal management. Thus, we expect the coefficient of $budins_i$ to be negative. The higher the value of the budgetary institutional index, the better it would be at containing state deficits.

Hypothesis 2: States having a ruling party which is part of the party / coalition at the centre would have a bias towards higher/lower expenditures. The party at the centre is expected to have a higher incentive to bail out a “friendly” government. This in turn would mean that a sub-national government would be encouraged to be fiscally lax if it can credibly believe that it would be bailed out of financial difficulties. However, there is an alternate view as proposed by Alt and Lowry (1994) and stressed by Jones, *et al* (2000). Provinces where the state government is led by the same party as the central government would have a *lower* per capita expenditure because “party discipline” would force the state government to adhere to the expenditure pattern set by the central government. This in turn might mean a lower expenditure. Therefore, the coefficient for $align_{it}$ is ambiguous.

In addition, it is imperative that we also consider the interaction among the political variables. We consider two such interactions. The first is the interaction between

“alignment” and “power”. The second interaction deals with “alignment” and “electoral competition”.

Hypothesis 2.1: States that are aligned with the Central Government, but also have a high proportion of members of parliament of the ruling party, might impact upon the fiscal management of that State. The coefficient for this variable $align_{it} * power_{it}$ is ambiguous, as one might argue that close alignment coupled with high power can accentuate a states proclivity towards fiscal mismanagement. On the other hand, given the antagonistic nature of Centre-State relationships, it might be possible that a high power can dampen the States desire for poor fiscal management, despite close alignment.

Hypothesis 2.2: Closely aligned States that have a high level of electoral competition are likely to have relatively poorer fiscal management. The coefficient for the variable $align_{it} * elcomp_{it}$ is likely to be positive because there is dual pressure of alignment and high competition. This also follows from the Roubini and Sachs (1989) assertion that in case of high turnover of governments, there is incentive for the incumbent government to leave a legacy of high debt and deficits for the future government.

For completeness, we consider some minor extensions of our earlier hypotheses:

Hypothesis 2.3: States that have a high proportion of MPs of the ruling party might have higher/lower levels of deficit. We are unsure about the sign of the coefficient for $power_{it}$ since the MPs might coerce the ruling state government to spend more or less depending on factors such as the level of influence they have.

Hypothesis 2.4: States that have high electoral competition would have higher levels of deficit. The coefficient of $elcomp_{it}$ is expected to be positive because high electoral competition might force the regional government to ‘bribe’ voters through higher public expenditures, or the incumbent government might have a perverse desire to leave a legacy of high debt and deficits for the future government.

Hypothesis 3: States with coalition governments would incur higher expenditures than States with Unitary governments. The coalition governments would have a bias towards higher expenditures because of the necessity of members of the coalition to cater to their specific constituencies. The bias becomes even more pronounced if the coalition members come together to form a government out of political expediency rather than ideological similarities. Thus, we expect the coefficient of pol_{it} to be positive, suggesting that the higher the value of the index (indicating increased numbers of coalition members) the higher would be the expenditures of that State.

3.4.2. Gross Transfers from the Centre

To strengthen our analysis further, we introduce a second working model which will focus on gross transfers from the centre ($gtrt$) as the dependent variable (eq.2). As noted, there have been very few attempts to analyse the determinants of total transfers¹³ (including loans, grants and shareable taxes). A previous study by Rao and Singh (2001) only analyses the non-debt transfers. Our empirical model is captured by the equation below :

$$\log(gtrt_{it}) = \beta_1 + \sum_{k=0} \delta_k \log(popnt_{it-k}) + \sum_{k=0} \gamma_k \log(gfdsdp_{i(t-k)}) + \sum_{k=0} \delta_k \log(sdptfc_{i(t-k)}) + \sum_{k=0} \varphi_k \log(dist_{i(t-k)})$$

¹³ Khemani (2003) is a notable exception

$$\begin{aligned}
& + \beta_2 \log(poverty_{it}) + \beta_3(align) + \beta_4(align_{it}) * (power) + \beta_5(align_{it}) * (elcomp) + \beta_6 * (budins_i) \\
& + \beta_7 * (pol_{it}) + \beta_8 * (power_{it}) + \beta_9 * (elcomp_{it}) + \beta_{10} * (fifthpay) + \varepsilon \quad (3.2)
\end{aligned}$$

where: $gtrt_{it}$ is the total gross transfers of state i at time t ; $popnt_{it-k}$ is the population of state i lagged k period; $gfdsdp_{i(t-k)}$ is the ratio of fiscal deficit to state domestic product at $(t-k)$ period; $sdptfc_{i(t-k)}$ is state domestic product at constant price factor cost at $(t-k)$ period; $dist_{it}$ is the “distance” of state i from the richest state in terms of state domestic product at time t ; and $poverty_{it}$ measures the proportion of people below poverty line.

In addition to these control variables, we add the political variables of affiliation ($align$), $power$, electoral competition ($elcomp$), budgetary institution index for state i ($budins_i$), and a number of interaction variables ($(align_{it}) * (power)$) and $((align_{it}) * (elcomp))$. β_1 and ε_t are a constant term and an error term, respectively.

The gross transfers from the Centre ($gtrt$) are defined to include grants (statutory and non-statutory), shareable tax revenues and loans from the centre. Of the three components that constitute $gtrt$, the first two form part of the revenue account, while the third is a component of the capital account.

The control variables include the following: state-wise population ($popnt$)¹⁴; per capita state domestic product ($sdppc$); the fiscal deficit of a state as a share of its output ($gfdsdp$) which is used to highlight the states which might be facing fiscal problems; the percentage of people below the poverty line ($poverty$) which is used to measure “backwardness”; and the deviation of a states income from the state with the highest

¹⁴ We lag this variable by one period since last period population would arguably be used as a base to work out today’s grants.

income (*distance*), which is used by the Transferring authorities to bring in an element of equity among the various States. Lastly, we add the political variables of alignment (*align*), direct influence of the central government (*power*) and a proxy of “swing” (*elcomp*).

The coefficient for *popnt* is expected to be positive as a highly populated state would in all likelihood receive a larger transfer. The coefficient for *gfdsdp*, which is a proxy for states with fiscal problems, is also expected to be positive because of the “gap-filling” (earlier finance commissions simply looked at the average revenue deficit of the state in question and gave additional grants to meet this deficit – thereby causing a moral hazard problem) approach to transfers adopted by previous Finance Commissions. The coefficient for *sdptfc* is expected to be positive, as a larger state would, in all likelihood, receive a larger transfer. The *distance* variable should also have a positive coefficient estimate, since we expect the poorer states to get higher transfers. Lastly, the coefficient for *poverty* ought also to have a positive coefficient.

As for the key political variables, we have the following hypotheses.

Hypothesis 4: The “friendly” states in fiscal distress would face a greater likelihood of increased transfers. Those governments at the state level that are composed of parties that constitute the government at the centre are more likely to receive increased grants and loans in times of fiscal stress. Thus, the coefficient of *align_{it}* is expected to be positive.

Hypothesis 5: States which have a greater proportion of ruling party MPs at the central level would receive more/less resources from the centre. We are uncertain about the sign for the coefficient for *power_{it}*. Rao and Singh (2001) claim that states with a higher proportion of ruling party members would be able to negotiate greater transfers because of

the combined impact of the state and central politicians. It is also possible, however, for a state with a high proportion of MPs from the ruling party to get fewer transfers, as the centre would try to directly influence the voters rather than be obscured by the state government. Here too, there are implications for interaction among the political variables.

Hypothesis 5.1 Closely allied States, with a high proportion of ruling party MPs at the Central level will receive more/less resources from the Centre. The coefficient sign for this variable ($align_{it} * power_{it}$) will be ambiguous because it depends on which factor holds a higher sway for transfers to take effect.

Hypothesis 6: States which have a high electoral competition will require lower ad hoc loans and transfers. Higher political competition in states that lead to the existence of coalition partners might make it difficult for them to have coordinated expenditure strategies. This might lead to lower than expected expenditures and consequently reduced need for grants. Another interpretation of this is that the party in the centre might be unwilling to provide higher grants in a highly competitive environment because it is unsure of the outcome. Alternatively, in a multiparty/coalition government no one takes fiscal responsibility (for instance, the other coalition partners can be blamed), so there may be more profligacy. Thus, a priori we are uncertain about the coefficient of $elcomp_{it}$.

Hypothesis 6.1: Allied States with higher electoral competition may receive lower/higher resources from the Centre. Here we must consider the interaction between $align_{it} * elcomp_{it}$, as this might provide a more credible impact on transfers from the Centre. Unfortunately, as with Hypothesis 6, we are uncertain about the sign of the coefficient.

Hypothesis 7: States with higher value on the budgetary management index should receive lower central transfers. Better institutions would be instrumental in sound fiscal management and therefore a better managed state would have lesser need for transfers from the Centre. Another way of arguing is that, given the traditionally gap-filling methods adopted by the Central Government, better managed States would automatically receive lesser transfers. Hence, ($budins_i$) is expected to have a negative coefficient.

Hypothesis 8: States with higher coalition members would receive more/less transfers from the Centre. The sign of the coefficient of pol_{it} is ambiguous because factors like alignment and electoral competition would play a greater role in determining higher ad hoc transfers.

3.5. Results and Analyses

As elaborated earlier, we attempt to analyse the state policies from two related questions. First, are the expenditure policies at the state level under the influence of political and institutional factors (Eq. 3.1) Second, are the transfers from the centre are influenced by the same political and institutional factors (Eq. 3.2) The generalized least squares (GLS) test, correcting for heteroscedasticity, is conducted on a pooled cross section data of 15 major states of the Indian government for the period 1985 to 2000¹⁵ Following Hendry (1974), we adopted the General-to-Specific autoregressive approach by starting the regressions with the general lagged variables at $(t - k)$ year, and keeping only the significant lags. To ensure, an adequate degrees of freedom, we opt to

¹⁵ A total sample size of 225.

include $k = 0, 1, 2$. As will be discussed further below, we do not find any significant coefficient estimate beyond $k = 2$.

3.5.1. Test Results for Revenue Deficit

Table 3.6 summarizes the results of our exercise to identify the determinants of government revenue deficit at the sub-national level and to examine the first three hypothesis listed previously. Overall, the explanatory variables explain at least 70 percent (as shown by the R-square) of the fluctuations in the revenues of the 15 states during the 15 years period.

The test results suggest that while per capita state output, the lagged revenue deficit variables and the change in the rate of growth of the state are strongly significant, the revenue deficit appears to be unaffected by the size of population across regions. The dummy variable for the pay commission awards is also not significant, presumably because it was introduced only in 1998 and therefore does not have a strong impact during our time frame.

The budgetary management index coefficient suggests that there is a significant inverse relationship between government expenditures and the value of the index. This confirms our assertion in Hypothesis 1 that the states with better institutions, viz. the ones with a higher value would normally tend to spend less¹⁶.

A priori we expect a “friendly” state government would tend to undertake increased expenditures, knowing that the centre will bail it out (hence a positive coefficient for the $align_{it}$ variable). However, the test result reports a negative coefficient

¹⁶ It may be noted that we constructed the index by assigning a value between 0 to 10 for each of the five components of the index. The index is thus an equally weighted one. This may be considered somewhat arbitrary since it may be argued that certain components are more crucial for maintaining institutional quality than others. In order to ensure that the index is not biased, we do a sensitivity analysis on the index, by allowing a different combination of arbitrary weights. In spite of this the significant inverse relationship is unchanged.

for our $align_{it}$ variable. This finding seems to support the claim of Alt and Lowry (1994) that the state government led by the same party as the central government would have a lower per capita expenditure because party discipline would force the state government to adhere to the expenditure pattern set by the centre. Another interpretation is as follows. Revenue deficit is defined as the difference between the revenue (current) expenditures and revenue receipts. This data is the *ex-post* figure obtained after being audited. It is entirely possible that the lower revenue deficit might have been influenced by the higher resources transferred by the central government to the “friendly” political party at the state level, which would have augmented the revenue receipts and consequently lowered the deficit. If that is the case, the lower deficit could actually mask the true performance of the state governments, given the fact that they are bailed out by the central government. We test this hypothesis later in the chapter by analysing the effect of political alignment on central transfers.

Inclusion of the interactive terms of $align_{it} * power_{it}$ (Hypothesis 2.1) and $align_{it} * elcomp_{it}$ (Hypothesis 2.2) do not appear to have any significant effect on the revenue deficit so we dropped them from the final regression. Similarly, electoral competition (Hypothesis 2.3) or the presence of high level of central government MPs (Hypothesis 2.4) do not appear to have any impact on revenue deficit. Lastly, our test result also suggests that the *pol* variable has no significant impact on the revenue deficit.

3.5.2. Test Results for Gross Transfers from the Centre

The regression results for the total transfers from the centre ($gtrt_{it}$) as the dependent variable are reported in Table 3.7. Overall, the R-square for the regression is around 90 percent, reflecting the overall goodness-fit of the model.

The test results indicate that the coefficient estimates for all control variables (the state GDP, fiscal deficit, population, poverty and distance) are significant and have the expected signs. The dummy for government pay rise continues to be insignificant here as well.

In analysing the political and institutional variables, we notice that the first political variable $align_{it}$ is positive and significant, confirming Hypothesis 4. The estimate coefficient for the variable $power_{it}$ on its own is not significant. However after interacting it with $align_{it}$ we find it to be negative and significant. The last finding largely confirms Hypotheses 5.1.

The political variable $elcomp_{it}$ is also found to be insignificant on its own, but interacting it with $align_{it}$, the coefficient estimate is found to be negative and significant. This suggests that a central government might be unwilling to invest in states that have a high degree of instability even if they are currently allied (Hypothesis 6.1). We interpret this in the following manner. In India, the voting patterns are largely determined by non-economic factors (like caste, regional affiliation etc.). Thus, in working out a cost-benefit analysis to determine whether to extend higher transfers to a state with “high” political competition, the central government might decide that higher transfers may not “buy” it power in the subsequent elections because voting is based on non-economic factors.

The coefficient of the budgetary management index $budins_i$ is significant and negative, confirming Hypothesis 7. Finally, the coefficient of the variable pol_{it} is not statistically significant in influencing the size of the transfer from the Centre.

Finally, there can be two criticisms of the latter part of our empirical exercise. First, the inclusion of the ‘formula’ determined portion of transfers in our dependent variable and second, the existence of endogenous variables. As an answer, we have

already given our reasons for considering ‘loans’ to be having an impact of softening the budget constraint, as the repayment liability is spread out and therefore can be negotiable, however, we did run the tests after removing the formula determined ‘shareable taxes’. We found the signs and significance levels of all the coefficients to be unchanged. Regarding endogeneity problems, we performed a 2SLS estimation using alternative instruments¹⁷ with both gross transfers and gross transfers *net* of shareable taxes, as dependent variables. Here among the key results are, that ‘political alignment’ continues to have a positive and significant coefficient. The budgetary institution index is no longer significant. We might infer from this that the States, irrespective of the nature of their budgetary institutions, always prefers higher transfers.

3.6. Conclusion

In this chapter we have attempted an analysis of the role of institutions and the political economy of decentralization in the Indian context with a focus on government expenditures and resource transfers.

With regard to institutional quality, our analysis appears to unambiguously support the hypothesis that institutions and, by extension, governance can make a major difference in fiscal management. The role of “effective institutions” in maintaining fiscal prudence cannot be sufficiently emphasized as they can pre-empt the role of politics in fiscal management to some extent.

With regard to the role of politics in fiscal management, results appear to indicate that the correct alignment amongst the political parties or coalition partners at the central and state levels influences the level of deficits. *Prima facie*, a close alignment between the

¹⁷ Instruments used were electricity per capita, agriculture as a share of SDP and administrative expenditure as a share of SDP, and we did a Hausman Specification test to confirm that the residuals are not significantly different from zero and hence the instruments may be considered to be valid.

state and central government seems to have a negative effect on the revenue deficit according our results. This may appear to be counter-intuitive until we recognize that a revenue deficit by definition is the excess of current expenditures over current revenue. Thus, a lower revenue deficit being an *ex post* indicator, need not necessarily indicate a lower expenditure. It might suggest a higher revenue receipt, which in turn may have accrued to the states through increased transfers.

To test the latter hypothesis, we examined the effects of political factors on central transfers and found political affiliations matter. Shared political affiliations at the state and central level of government translate into higher resource transfers from the centre. However, there are certain ambiguities in the nature of transfers as far as the relative strength of the central government is concerned vis a vis the state. Thus, if a state has a greater proportion of elected members of parliament at the centre from the ruling party, we find that this leads to reduced transfers. This leads us to believe that there is an inherent antagonistic relation between the centre and the states. A third factor that we analysed is the level of electoral competition. We suggest that a high electoral competition might lead to instability and therefore would lead to lower transfers from the centre, even if the government was being headed by an aligned party of the central government. Overall it appears that similar political affiliations is associated with a lower current account deficit because of higher transfers. We suggest that the revenue deficit is an *ex-post* phenomenon and consequently, the revenue deficit is lower due to the revenues being augmented through central transfers for the affiliated state government.

The other findings in the chapter may be considered to be only partially conclusive, but are important nevertheless. We suggest that the nature of government at the state level has a bearing on the way the central government views its prospects. We believe that the party in power at the centre thinks strategically regarding whether or not

to bail out a state government. Thus, a state which has a coalition government in power is unlikely to receive greater grants even if its own party is a member of the coalition. This is so as the party might try to maximize its chances of re-election by extending its limited resources to those states where it has a reasonable chance of retaining power on its own. We believe this to be consistent with the nature of federal politics that exists in India where a lot of voting is done along party lines, and these affiliations are based on non-economic factors such as caste, religion or language (Butler, *et al.*, 1995). This is also in accordance with Bardhan's (2002) observation that elections are "blunt instruments of political accountability".

Table 3.1: Basic Statistics of Selected Indian States

	State	Population (millions)		Net State Domestic Product (Rs. millions)		Per capita State Domestic Product (Rs.)	
		1991	2001	1990-91	1999-2000	1990-91	1999-2000
1	Andhra Pradesh	66.5 (7.9)	75.7 (7.4)	311650 (8.0)	1105250 (7.9)	4687	14786
2	Assam	22.4 (2.7)	26.6 (2.6)	94980 (2.4)	250510 (1.8)	4238	9568
3	Bihar	86.4 (10.2)	109.8 (10.7)	227870 (5.8)	627590 (4.5)	2638	5855
4	Gujarat	41.3 (4.9)	50.6 (4.9)	241800 (6.2)	893170 (6.4)	5853	18014
5	Haryana	16.5 (1.9)	21.1 (2.1)	122380 (3.1)	416270 (3.0)	7435	20239
6	Karnataka	45.0 (5.3)	52.7 (5.1)	205510 (5.3)	846860 (6.0)	4569	16317
7	Kerala	29.1 (3.4)	31.8 (3.1)	121730 (3.1)	587040 (4.2)	4183	18605
8	Madhya Pradesh	66.2 (7.8)	81.2 (7.9)	265150 (6.8)	863850 (6.1)	4007	10861
9	Maharashtra	78.9 (9.4)	96.8 (9.4)	581370 (14.9)	2122160 (15.1)	7365	22385
10	Orissa	31.7 (3.8)	36.7 (3.6)	96640 (2.5)	327290 (2.3)	3052	9049
11	Punjab	20.3 (2.4)	24.3 (2.4)	167380 (4.3)	549600 (3.9)	8253	23039
12	Rajasthan	44.0 (5.2)	56.5 (5.5)	182810 (4.7)	666450 (4.7)	4154	12099
13	Tamil Nadu	55.9 (6.6)	62.1 (6.1)	276740 (7.1)	1178250 (8.4)	4954	19172
14	Uttar Pradesh	139.1 (16.5)	174.5 (17.0)	494960 (12.7)	1646300 (11.7)	3558	9649
15	West Bengal	68.1 (8.1)	80.2 (7.8)	315000 (8.1)	1223330 (8.7)	4627	15502

Notes: Figures in brackets are percentages to total population and total national income (NSDP), respectively.

Source: Planning Commission, Government of India

Table 3.2: Major Fiscal Indicators (All States)*(Rupees billions)*

Fiscal Year	Revenue Receipts	Revenue Expenditure	Revenue Deficit	Gross Fiscal Deficit	Outstanding Liabilities
1985-86	334.2	327.7	-6.5	75.2	522.8
1986-87	382.3	380.6	-1.7	92.7	606.4
1987-88	440.0	450.9	10.9	112.2	690.8
1988-89	504.2	522.3	18.1	116.7	781.8
1989-90	565.4	602.2	36.8	154.3	913.9
1990-91	664.7	717.8	53.1	187.9	1072.1
1991-92	805.4	861.9	56.5	189.0	1242.7
1992-93	910.9	962.1	51.1	208.9	1403.1
1993-94	1055.6	1093.8	38.1	206.0	1598.2
1994-95	1222.8	1284.4	61.6	277.0	1837.6
1995-96	1368.0	1450.0	82.0	314.3	2107.3
1996-97	1528.4	1689.5	161.1	374.4	2405.2
1997-98	1703.0	1866.3	163.3	442.0	2778.4
1998-99	1764.5	2200.9	436.4	742.5	3379.0
1999-2000	2072.0	2610.0	538.0	914.8	4132.1

Notes: ‘-‘ indicates surplus

Source: Finances of State Governments, Reserve Bank of India, various issues

Table 3.3: Data Description

Variable	Description	Source
<i>sdppc</i>	Per capita State Domestic Product (SDP)	Planning Commission, Government of India
<i>sdptfc</i>	State Domestic Product at Factor Cost	Planning Commission, Government of India
<i>sdpchrog</i>	Change in rate of growth of SDP	Calculated
<i>popnt</i>	State-wise population	Census data, Government of India
<i>rdpc</i>	Revenue Deficit per capita	Finances of State Governments, Reserve Bank of India
<i>gfdsdp</i>	Fiscal Deficit as a ratio of <i>sdptfc</i>	Finances of State Governments, Reserve Bank of India
<i>poverty</i>	Percent of people below the poverty line	National Human Development Report, Government of India
<i>distance</i>	Deviation of State income from State with the highest income	Calculated
<i>gtrt</i>	Gross Transfers from the Central Government	Finances of State Governments, Reserve Bank of India

Source: Compiled by authors

Table 3.4: Indices for Budgetary Institutions

	States	Fiscal Responsibility	Provincial Borrowing Ability	Municipal Borrowing Ability	Public Sector Investment	Contingent Liability	Total
1	Andhra Pradesh	2.5	10	10	2.5	5	30
2	Assam	0	7.5	5	0	10	22.5
3	Bihar	2.5	5	5	2.5	5	20
4	Gujarat	0	7.5	10	5	10	32.5
5	Haryana	5	5	5	5	5	25
6	Karnataka	5	7.5	10	7.5	10	40
7	Kerala	0	7.5	5	5	5	22.5
8	Madhya Pradesh	0	7.5	5	2.5	5	20
9	Maharashtra	2.5	10	10	7.5	5	35
10	Orissa	0	5	5	5	5	20
11	Punjab	2.5	7.5	10	2.5	5	27.5
12	Rajasthan	0	5	5	5	10	25
13	Tamil Nadu	0	7.5	10	7.5	5	30
14	Uttar Pradesh	2.5	7.5	5	5	5	25
15	West Bengal	0	10	5	0	10	25

Source: Computed by authors (see text for details)

Table 3.5: Summary of Indices

	States	State Elections	Nature of Government (pol)	Electoral Competition (Elcomp)	Central Government Power*
1	Andhra Pradesh	1985 1989 1994 1999	0 0 0 0	0.37 0.37 0.40 0.40	14.3 4.8 59.5 59.5 38.1
2	Assam	1985 1991 1996	3 0 0	0.31 0.53 0.55	28.6 35.7 57.1 42.9 7.1
3	Bihar	1985 1990 1995	0 3 0	0.34 0.46 0.45	92.3 86.5 1.9 51.9 57.7
4	Gujarat	1985 1990 1995 1998	0 1 0 0	0.22 0.16 0.36 0.32	92.3 88.5 19.2 38.5 73.1
5	Haryana	1982 1987 1991 1996	3 0 0 1	0.43 0.43 0.44 0.33	100.0 60.0 90.0 20.0 10.0
6	Karnataka	1985 1989 1994 1999	0 0 0 0	0.38 0.38 0.46 0.40	85.7 3.6 82.1 75.0 46.4
7	Kerala	1982 1987 1991 1996	2 2 2 2	0.48 0.53 0.42 0.47	65.0 10.0 65.0 80.0 0.0
8	Madhya Pradesh	1985 1990 1993 1998	0 0 0 0	0.26 0.33 0.36 0.35	100.0 77.5 67.5 20.0 75.0

Table 3.5: Summary of Indices (Contd.)

	States	State Elections	Nature of Government (pol)	Electoral Competition (Elcomp)	Central Government Power*
9	Maharashtra	1985	0	0.34	89.6
		1990	1	0.38	33.3
		1995	1	0.52	79.2
		1999	1	0.31	31.3
					20.8
10	Orissa	1985	0	0.25	95.2
		1990	0	0.26	85.7
		1995	0	0.45	61.9
					95.2
					76.2
11	Punjab	1985	0	0.42	46.2
		1992	0	0.14	7.7
		1997	1	0.43	92.3
					15.4
					84.6
12	Rajasthan	1985	0	0.29	100.0
		1990	1	0.30	96.0
		1995	1	0.38	52.0
		1998	0	0.35	48.0
					20.0
13	Tamil Nadu	1984	0	0.46	94.9
		1989	0	0.47	2.6
		1991	0	0.36	100.0
		1996	0	0.39	5.1
					7.7
14	Uttar Pradesh	1985	0	0.28	98.8
		1989	1	0.36	77.4
		1991	0	0.33	6.0
		1993	2	0.40	8.3
		1996	2	0.27	70.2
15	West Bengal	1982	2	0.39	38.1
		1987	2	0.37	88.1
		1991	2	0.41	11.9
		1996	2	0.42	100.0
					2.4

Notes: * includes the proportion of MPs of the ruling party in each state for central government elections held in the years 1984, 1989, 1991, 1996 and 1998

Source: Computed by Authors (see text for details)

Table 3.6: An OLS Analysis of Determinants of State level Deficits
(White Heteroscedasticity Consistent Estimators)

Dependent Variable: State Revenue Deficit per capita ($rdpc_{it}$)

Independent Variables	Coefficient Estimates.
State Per capita Domestic Product $\text{Log}(sdppc_t)$	115.72*** (5.46)
Change in State Rate of Growth $(sdpchrog_t)$	1.16** (1.98)
Population $\text{Log}(popnt_t)$	n.s
Revenue Deficit per capita (lagged) $(rdpc_{t-1})$	0.89*** (10.67)
Budgetary institution index $(budins)$	-4.28*** (-2.85)
Political Alignment $(align)$	-54.25*** (-2.85)
Political Alignment * Power $(align*power)$	n.s
Political Alignment* Electoral Competition $(align*elcomp)$	n.s
Nature of Government (pol)	n.s
Electoral Competition $(elcomp)$	n.s
Power of Central Government $(power)$	n.s
Fifth Pay Commission $(Fifthpay)$	n.s
observations	225
Adjusted R-square	0.74
F-statistic	112.15

Notes: n.s: not significant at 10% significant level, and therefore is dropped from the final regression.

(): Figures in brackets below the coefficients are the t-values; * Significant at the 10 per cent level; ** Significant at the 5 per cent level; *** Significant at the 1 per cent level

Table 3.7: An OLS Analysis of Determinants of transfers from Centre to State
(White Heteroscedasticity Consistent Estimators)
(# of observations = 225)

Dependent Variable: Gross Transfers from Centre ($\log(\text{gtrt}_{it})$)

Independent Variables	Estimate Coefficients.
State Gross Domestic Product $\text{Log}(\text{sdptfc}_t)$	0.53*** (12.26)
Fiscal deficit as a ratio to State Output $\text{log}(\text{gfdsdp}_t)$	0.13*** (2.60)
Population (lagged) $\text{Log}(\text{popnt}_{t-1})$	0.22*** (5.22)
Poverty Ratio (poverty_t)	0.18*** (5.99)
Distance from richest State (dist_t)	0.24*** (7.20)
Budgetary institution index (budins)	-0.01*** (-4.15)
Political Alignment (align)	0.22** (2.11)
Political Alignment * Power $(\text{align}*\text{power})$	-0.001* (-1.88)
Political Alignment* Electoral Competition $(\text{align}*\text{elcomp})$	-0.40* (-1.86)
Nature of Government (pol)	n.s
Electoral Competition (elcomp)	n.s
Power of Central Government (power)	n.s
Fifth Pay Commission	n.s
observations	225
Adjusted R-square	0.91
F-statistic	266.51

Notes: n.s: not significant at 10% significant level, and therefore is dropped from the final regression.

(): Figures in brackets below the coefficients are the t-values; * Significant at the 10 per cent level; ** Significant at the 5 per cent level; *** Significant at the 1 per cent level

4. Political Competition, Welfare Outcomes and Expenditures on Human Development: The Experience of a Democracy

4.1. Introduction

This chapter investigates the effects of special interest lobbying, electoral competition and democratic participation on the delivery of public services and human development outcomes in a developing country.

A large body of literature suggests that rapid growth rates, coupled with high levels of investment in human capital, will eventually result in higher living standards (World Bank 2002). In particular, when growth raises incomes above a threshold level, this provides a buffer against exogenous shocks that would otherwise result in mortality, deprivation, or famine. However, “growth sceptics” have noted, that this mechanism relies upon the growth dividend percolating to the most vulnerable members of society – an outcome that is not assured and is likely to be achieved over the long run. In addition, the record of growth in recent decades shows that many countries with low per capita growth rates have succeeded in providing health services and meeting basic nutritional needs, while others with similar or higher growth rates have failed (Sen 1982). Thus it is insufficient to merely consider output levels in isolation, without focusing on ‘outcomes’¹.

In this chapter we provide an alternate explanation to resolve this anomaly. We argue that, for any given set of economic constraints (such as budgetary revenues, or per capita GDP), the level and quality of public services provided by a government in the short run is determined largely by political factors. Thus it is necessary to gauge the level of political willingness to tackle issues pertaining to human development. Governments face multiple pressures when deciding on the allocation of their budgets

¹ Sen (1982) has argued convincingly that in the case of the Bengal famine of 1942, outputs in the form of food production did not translate into the ‘outcome’ of food availability for all.

across competing demands. On the one hand well-organized special interest groups will lobby the government, through political contributions and other means, for various forms of sector-specific policy concessions. However, such policy distortions come at a cost, if they lower general welfare, and this threatens the survival of the government. In a well functioning democracy, with a high level of political competition and a high level of political participation, there is a greater likelihood of a government losing power if its policies fail to provide for the needs of the electorate. The government must therefore trade-off the private benefits of distorting policies in favour of special interest groups, against the possible political costs of neglecting the welfare of its citizens. In a well functioning democracy voters can signal their preferences through the electoral system and hence the political costs of a policy distortion that lowers average welfare, will be larger. Our theoretical analysis therefore predicts that, *ceteris paribus*, governments that face high levels of political competition, coupled with high levels of voter participation, will deliver better public service outcomes, than governments in regimes with low levels of either political competition or voter participation.

We test the predictions of our theory on variations in the infant mortality rate² (IMR) across the states of India. The empirical results strongly support the predictions of the model. The focus on IMR within a given country seems particularly appropriate for our purposes. First, as suggested by Conley and Springer (2001), is the sensitivity of IMR over a short time period to investments in public health care. Other indicators, like life expectancy, are expected to have a long lag. Another reason, for choosing IMR in the current context, is that in India, public health is delineated as a 'State Subject' under the Indian Constitution. Thus, this parameter

² Infant Mortality Rate is defined as the number of deaths by age one, per thousand live births.

should identify, why certain regions of India have better health outcomes as compared to others. Besides this, IMR is also considered as a general indicator of “social upliftment” and a broad proxy for human development, as it is ‘a generally accepted social indicator of a nation’s health and quality of life, particularly for the poorest members of society.’ (Conley and Springer (2001) Pg 770). It therefore serves as a useful measure of an important dimension of human development.

The focus on a single country, with a federal system, also seems appropriate in this context. Despite advances in medicine and public health, there still exist wide variations in infant mortality rates across countries. High-income countries have an average infant mortality rate of around 5 as compared to 80 in the low-income countries.³ This is perhaps not unexpected, as more developed economies can be expected to have better medical facilities, nutrition and sanitation and hence superior health outcomes (Conley and Springer, 2001). However, somewhat more surprisingly, in India too, there is also substantial inter regional variation in the IMR. In 1991, the state of Kerala had an IMR of 42, while in Madhya Pradesh it was 133. On the other hand average per capita State Domestic Product (SDP) in these states were Rs. 8672 and Rs. 6111, respectively⁴ – suggesting perhaps that the variation in IMR may be due to factors additional to economic growth. Closely related to this was that the impact of health expenditures on infant mortality. There are varying views, with claims of an ‘inverse association between infant mortality and government health expenditure’ although they are not persistent, Deolalikar (2004). However it is also accepted that the impact of health expenditures will depend strongly upon the efficiency of their utilisation. As the World Development Report (2004) argues that targeting of

³ Human Development Report 2003

⁴ During the period 1985-2000.

expenditure is equally crucial. So a government can enhance the levels of public expenditure but would continue to get poor outcomes⁵.

A second advantage of focusing on a single country is that it allows for a more precise interpretation of the empirical results. Many of the factors that vary across countries (such as political systems, trade and exchange rate regimes, judicial systems) are common within a country. This implies that there are likely to be fewer missing explanatory variables and unaccounted interactions in the regressions, resulting in a more controlled regression and coefficients that are more easily interpreted.⁶

Thus this work is motivated by the concern of weakness in service delivery in the social sectors. It is true that India has made significant progress towards improved human developmental indicators over the past two decades, but still there are significant interstate variations in levels and rates of improvement. This has led to doubts being cast over India's capability to meet the Millennium Development Goals (MDG)⁷. It is also a fact that public spending on health and education have increased, however even though it theoretically ought to give us better outcomes, it has not done so across a number of states. The reason for this may be the lack of political accountability. The low political accountability can be due to two factors – first low political competition, which we consider in our work and the second is low awareness of the public. The World Bank in its report on 'India: Sustaining Reform and

⁵ As the World Development Report (2004, p 32) says "Public spending makes improvement possible, but the improvements will fall short if spending fails to reach poor people."

⁶ By way of example the impact of political competition in a US type of congressional system will differ from that of a parliamentary democracy – as in India. By excluding regimes in the former category the coefficient on the political competition term can be interpreted with more accuracy.

⁷ The MDGs were listed in September 2000 at the Millennium Summit in New York. These are a set of numerical targets to be achieved by 2015 and are focused on certain achievements in human development. These include, reducing poverty by 50 percent, achieving universal primary education and gender equality, reducing infant and child mortality by two thirds and maternal mortality by three quarters. It also includes reversing the spread of HIV/AIDS and other communicable diseases and doubling the proportion of people with access to safe water

Reducing Poverty” (2003) comments on the latter, when it suggests that one way of forcing governments to focus on social outcomes is by generating and disseminating ‘information about progress in service delivery’. The report recommends that there should be an independent source for measuring outcomes in the areas of health and education, where states have primary responsibility. Unfortunately, even if such measures are taken, this will not lead to any improvement in service delivery, if the election results are not contingent upon human development issues. Thus states where political competition is low, or is based on factors such as caste, class or ethnicity, would be expected to have lower concern about outcomes.

The remainder of the chapter is organised as follows. Section 4.2 provides a brief literature review on infant mortality issues and the literature on political competition, Section 4.3 sets up a simple model based on the common agency framework of Grossman and Helpman (1994) to analyse the impact of electoral competition on health policy outcomes. The data and empirical testing is done in Section 4.4 and Section 4.5 concludes.

4.2. Literature Review

A number of studies have examined the link between IMR and developmental expenditures. Papers by Judge *et al* (1998), Babzano and Hillman (1994), Pampel and Pillai (1986), mostly corroborate the view that higher health care expenditures reduce IMR. However, these studies typically focus on developed countries and do not examine the political economy incentives that drive health policies. Thus, the paper by Judge *et al* (1998) considered variables like income-inequality, health expenditures as a proportion of GDP, social security transfers, and percentage of women in total workforce. Similarly, Babazano and Hillman (1994) did a cross-sectional study on the

effects of health spending on IMR for OECD countries and found that the proportion of health care expenditure was not a significant determinant for IMR. Conley and Springer (2001) also analyse the effect of state welfare spending on IMR for the OECD countries. They include a 'fixed-effect' variable in order to factor out the nation-specific effects. The study finds that state spending on welfare affects IMR both through social and medical mechanisms. The evidence on the effects of government spending on IMR therefore appears to be mixed, suggesting that there may be other factors (such as political incentives), which determine the effectiveness of spending on health outcomes.

There is a related body of literature that examines the role of politics in welfare spending. This issue has been analysed by Cameron (1978), Castles and Mitchell (1992) and Hicks and Swank (1992). In an early paper Cameron (1978) suggests causes for an increasingly pervasive government sector. He looks at five underlying causes - economic, fiscal, political, institutional and international and argues "democracy implies that the contenders for political office alter their programs in order to enhance their political appeal" (Cameron, 1978, p 1246). This can be in the form of reduced taxes or higher government expenditures (or both). This is perhaps of some relevance to a developing country democracy such as India where the bulk of voters do not pay taxes. Cameron's interpretation suggests that when the median voter pays no taxes, the government might use public spending as a way of securing political support.

Hicks and Swank (1992) show that electoral turnout has a positive influence on welfare effort in 18 developed democratic nations. They further suggest that the presence of leftist or centrist governments also increase commitment to higher welfare effort.

Grossman and Helpman (1994) consider a model of menu auction, where multiple lobbyists (principles) try to influence a single government (agent), by giving political contributions in order to get some subsidy. This is referred to as the common agency problem, where the lobbyists take into account the governments objective function while deciding a ‘menu’ of contributions to offer in lieu of a subsidy.

A related literature based on the seminal work of Grossman and Helpman (1994, 1996) examines the effects of lobbying on environmental policy choices. The general conclusion emerging from this work is that greater political accountability leads to improved policy outcomes (Damania *et al* (2003), Deacon (1999), Murdoch and Sandler (1997), Deacon (2003), Triesman (2000), Rose Ackerman (1999), Johnston (1999)). Damania *et al* (2003), extend the Grossman-Helpman framework to include the impact of electoral competition. They find that apart from more lobby groups, a greater degree of democratic participation leads to increased stringency of policies.

While most of the empirical work in the area of infant mortality focuses on cross-country analysis, to our knowledge there has been no work on the reasons for variations in outcomes within countries. Typically, most of the literature associated with infant mortality, tries to link its effect on economic growth. Preston (1976) suggested economic development as a major factor in determining life expectancy. Bhargava *et al* (2001) also model the ‘proximate determinants of economic growth’ by focussing on health and human development as determinants. Using panel data regressions, they find a positive effect of adult survival rates on the GDP growth rates in low-income nations. Similarly Younger (2001) approaches the growth issue by analysing declines in IMR. It uses lagged IMR data as a dependent variable for the change in IMR and then looks for absolute and conditional convergence, using other

fixed effect variables like school enrolments, availability of healthcare etc. He finds surprisingly that health availability has no impact on declining IMR. With respect to public spending and impact on social indicators, Filmer and Pritchett (1999) find no relation between health outcomes and public spending, while Gupta *et al* (2001, 2002) find a weak positive relationship.

With regards to India, there have been a few empirical analyses on the subject. Prabhu and Chatterjee (1993) used principal component analysis to claim that the extent of infrastructure development at the state level has a significant impact on health indicators. Pradhan and Abraham (2002) show that human development policy has a significant impact on economic growth. More recently Kaur and Misra (2003) using OLS have found a weak relationship between public spending and health outcomes.

The focus of our study is not on growth, but on the factors, that might affect health outcome levels. Thus we wish to study the quality of governance across the Indian States. Arguably, IMR, which is a good measure of the quality of health in a region, may be affected by economic, social and political variables.⁸ Thus the existing literature does not explain adequately, why in a democratic country like India, there ought to be such large variations in infant mortality rates (Kerala 42 and Madhya Pradesh 133 in 1991). We suggest that part of the variation can be explained through the level of electoral competition within these states. We thus synthesise the inter connected strands of literature and argue that political competition, as exemplified by both electoral competition and democratic participation, would force a government to focus on better governance through higher provision of public goods and therefore better outcomes on public welfare.

⁸ As Sen (1985, 1987) suggests, poverty is the inability of an economy to achieve 'ends'.

4.3. The Model

The model is based on Damania *et al* (2003) and attempts to analyse the effect of political competition on government policy. A small state economy consists of consumers and firms. A subset of these firms form a lobby group which attempts to induce the government to provide sector specific policy favours. For concreteness we focus on the analytically simple case of a subsidy to production – though more general interpretations are possible.⁹ However, the government must eventually face a budget constraint, which limits its spending options. Hence support for the lobbying firms implies that there is less available for other purposes, such as public health expenditures. For simplicity we focus on the not unrealistic case where the budget constraint binds and is given by:

$$\bar{G} = c^x + s \quad (1a)$$

where c^x is government expenditure on public services¹⁰ (like basic health) and s is the government subsidy provided to the lobbying firms. Citizens derive utility from the public service c^x and a numeraire good y with constant marginal cost equal to one¹¹. Citizen utility is thus

$$\Omega^P(x, Z^P) = u(x) + c^y \quad (1b)$$

where x is the level of consumption of health expenditure, $x = x(c^x)$, is the health production function, $x' > 0$ and $x'' < 0$, $u(c^x)$ is a strictly concave and differentiable

⁹ This is just one of many equivalent ways of assessing the effects of government support to a few.

¹⁰ It must be specifically mentioned here that since the focus of this chapter is on ‘outcomes’ rather than ‘outputs’, c^x refers to the effective public expenditure (on say health). Thus the citizens are not merely concerned with the money that is spent in the health sector, but rather at the whole gamut of better health management.

¹¹ The good z does not enter the consumer’s utility function because we assume that this good is entirely exported.

sub-utility function and Z^P is the vector of any other factors which the consumers care about.

The lobbying firms produce good z at a given price p^{*12} . Production of z by each of the n identical firms is given by z_i , where $nz_i = Z$. The profitability of the lobbying firms depends in part on the subsidy (s) that they receive. This in turn is determined by the amount of contributions $C^R(s)$, paid by the lobbyists to secure the subsidy, where $C_s^R > 0$. We later define how the subsidy and contributions are optimally determined. For simplicity we assume that good z is exported. The cost of producing good z is given by $v(z_i(s))$, where we assume $v_z > 0$, and $v_{zz} > 0$. Given the subsidy (s), the profit function of each firm is:

$$\Pi^R(s) = U^R(p, z, s) - C^R(s) \quad (2a)$$

where,

$$U^R = p^* \cdot z_i - v(z_i(s)) \quad (2b)$$

For future reference we note that differentiating Equation (2b) with respect to z yields the first-order condition

$$\frac{\partial \Pi_i}{\partial z_i} = p^* - v_z = 0, \quad (3)$$

Thus firms produce up to the point where the price is equal to the net-of-subsidy marginal cost.

The model defines a three-stage game, based on the following sequence of events.

Stage 1. Firms in sector z_i form their own lobby group to obtain subsidies / support from the government. The lobby groups offer the incumbent government a

¹² The world market price p^* is exogenously given as the producer is a price taker in a small state.

specific political contribution for selecting a policy s . The firms political strategy therefore consists of offering a political contribution schedule that links contributions to the subsidy received.

Stage 2. The government then sets its optimal public expenditure policy, given the lobby groups' strategies and the expected level of political rivalry that determines its survival after the election. This is determined by the level of democratic participation and political competition in the next election. The government receives the political contribution from the lobbies.

Stage 3 When the subsidy has been set, the firms choose their output levels.

The n firms are sufficiently few that lobby group organisation is feasible. On the other hand, the general citizens are many and dispersed and hence unable to form a coherent lobby group. This is consistent with Olson's (1965) assertion that large groups face substantially higher collective action costs than do smaller groups. Aggregating equation (2b), the firm lobby's indirect utility is given by

$$\Omega^R(s, Z^R) = nU^R(s) - C^R(s), \quad (4)$$

where $nU^R(s)$ are the lobbying firms' aggregate profits, given the subsidy s and Z^R is the vector of all other factors that influence its profits (ignored in the model for simplicity).

The incumbent government's objective function is given by

$$G(s) \equiv C^R(s) + \phi(\Omega^R(s) + \Omega^P(s)) \quad (5)$$

where, $C^R(s)$ is the political contribution paid by firms, $\phi = \gamma\mu$ is an index for political competition, where γ is the democratic participation rate and μ is the level of

political competition. $\Omega^R(s)$ is the firm lobby's utility function. $\Omega^P(s)$ is the consumer's utility function.

Government utility, $G(s)$, is thus a weighted sum of the political contributions and the level of total social welfare. As in Grossman and Helpman (1994), it is assumed that contributions are valued by the government for their many uses. They can for instance, be used for campaign spending or by the incumbent politicians' for personal consumption'. As suggested by Grossman and Helpman, social welfare is also valued because it increases the government's chances of retaining power in the next election.¹³ The weight given to social welfare (the sum of firms and citizens utility) depends upon the probability that the government remains in power. This probability is affected by two factors: γ which represents the expected democratic participation rate in the elections, and μ which is the expected degree of political competition in election. We thus follow the influential work of Vanhanen (2000), who suggests that both political participation and political competition are necessary requirements for democracy. This implies that in a democratic society, a politician would be more responsive to public policy decisions, if there exists an actively participating electorate and a significant opposition.

An implication of this formulation is that a proportion $(1 - \gamma)$ of the electorate does not participate in the political process. This might be due to electoral apathy, or due to constitutional restrictions, which prevent a certain portion of citizens from voting.¹⁴ What this formulation highlights is that if democratic participation is low, it

¹³ In the context of a democratic system this is likely to occur if increases in aggregate welfare increase the welfare of the median voter, or the decisive group in a coalition. We do not explicitly model these issues which have been explored in great depth in the political economy literature (Persson and Tabellini, 2002)

¹⁴ For instance in some countries exclusion is based on gender, in others it is based on ethnicity or religion.

will distort the government's objective function in favour of special interest groups' campaign contributions (or bribes).

However γ is only a partial measure of the degree of democracy, because if all citizens are coerced into electing and there is only one available choice, there is no incentive for the incumbent to focus on social welfare or alter their policies in any way. Hence, the effect of democratic participation also depends crucially on the expected level of political competition, μ .¹⁵

The equilibrium in this model has the structure of a common agency model by Bernheim and Whinston (1986) where several principals (the lobbying firms in our model) attempt to induce the single agent (the government) to undertake a certain action. This equilibrium maximizes the joint surplus of all parties, as discussed by Grossman and Helpman (1994). In our set-up, one condition that the equilibrium subsidy, s^* , satisfies is given by

$$s^* = \text{Arg max } G(s) \equiv C^R(s) + \phi(\Omega^R(s) + \Omega^P) \quad (6)$$

Differentiation of (5) with respect to the subsidy yields

$$\frac{\partial G}{\partial s} = n \frac{\partial C^R}{\partial s} + \phi \left\{ \frac{\partial \Omega^R}{\partial s} + \frac{\partial \Omega^P}{\partial s} \right\} = 0 \quad (7)$$

Turning next to Stage 1 of the game, where contributions are determined, differentiating equation (4) with respect to contributions C^R .

$$\frac{\partial \Omega^R}{\partial C^R} = \frac{\partial U^R}{\partial s} \frac{\partial s}{\partial C^R} - 1 = 0 \quad (8.1)$$

¹⁵ High levels of political participation without alternatives to choose from will have little relevance in deciding policy outcomes, e.g. elections in single party dictatorships (Persson and Tabellini, 2002).

Note that since $\frac{\partial U^R}{\partial s} > 0$, then an interior solution to equation 8.1 exists only if

$\frac{\partial s}{\partial C^R} > 0$. Thus by the inverse function theorem, equation (8.1) can be rearranged as

$$\frac{\partial U^R}{\partial s} = \frac{\partial C^R}{\partial s} \quad (8.2)$$

Equation (8.2) suggests that the firm will pay contributions up to the point where the marginal benefits from a higher subsidy received from the government equals the marginal cost of higher contributions. In this sense, the contributions to the politicians by the firms are *locally truthful*, since they reveal the benefits of changing government policy.

Substituting (8.2) into the first-order condition (7)¹⁶ and using equation (1) defines the optimal policy of the government:

$$\frac{\partial G}{\partial s} = n \frac{\partial C^R}{\partial s} - \phi \frac{\partial \Omega^P}{\partial x} \frac{\partial x}{\partial c^x} = 0 \quad (9)$$

Thus the government distributes its budget between the subsidy to lobbyists and expenditure on health to equate the politically relevant marginal benefits to the politically relevant marginal costs. The former include the increase in contributions flowing from the higher profits accruing to firms, while the latter include the welfare loss resulting from a decline in public services delivered to the electorate. The importance given to the welfare loss depends upon the expected political costs as summarized by the electoral effect (ϕ).

We now analyse the impact of electoral competition on the level of subsidies provided by the government to the firms. Totally differentiating (9) and rearranging yields,

¹⁶ We use the fact that $\frac{\partial U^R}{\partial s} = \frac{\partial C^R}{\partial s} \Rightarrow \frac{\partial \Omega^R}{\partial s} = 0$ (from equation 7.2).

$$\frac{ds}{d\phi} = -\frac{\partial^2 G}{\partial s \partial \phi} \Big/ \frac{\partial^2 G}{\partial s^2} < 0 \quad (10)$$

Since, by the second order conditions, $\frac{\partial^2 G}{\partial s^2} < 0$ and $\frac{\partial^2 G}{\partial s \partial \phi} = -\frac{\partial \Omega^P}{\partial x} \frac{\partial x}{\partial c^x} < 0$

Thus the model yields the following prediction that we test in the following section:

Prediction: Higher electoral competition will lead to (i) increased welfare spending by governments and (ii) better health outcomes.

4.4. Background, Data and Empirical Results

The key point that we are trying to make here is that while economic growth might be a natural driver of human development, what is also strongly desirable is the ability of governments to deliver public services. The World Development Report (2004) emphasises this when it suggests “ The responsibility that governments take on for basic health and education can be discharged in many ways – among them, fostering economic growth, increasing public spending and applying technical interventions. Each can contribute to better outcomes. But if they are not supporting services that work – services that result from effective institutional arrangements – they will not make a large sustainable difference” (World Development Report (2004), p 32). In other words often mere public expenditures is not enough. Thus electoral competition can serve as one such democratic institutional arrangement, which can help augment the ‘outcome’ effect of public expenditures.

The existing literature on IMR, viz. Preston (1976), Bhargava *et al* (2001) Younger (2001) has mostly use a cross-country or pooled data to estimate the determinants of IMR. Typically, OLS estimators controlling for nation/region specific fixed effects have been used and in some cases a lag of IMR has been used as

explanatory variables. Some of the major determinants of IMR have been identified in the literature as, expenditure on public health, poverty levels, income levels, literacy – particularly female literacy and factors like the presence of doctors or medical facilities. The objective of our study is to analyse whether electoral competition plays a role in reducing infant mortality (through direct or indirect channels), after controlling for these factors. Typically most research that use cross-country panel or pooled data to estimate the determinants of IMR, use a specification of the form:

$$IMR_{it} = \alpha + \beta_1 X_{it} + \varepsilon$$

where X_{it} is a vector of other exogenous variables that would impact the mortality rates. To this, recent extensions have added country or time specific fixed effects in order to account for the question whether some ‘intrinsic societal characteristic’ that might tend to lead to low IMR in certain regions.

Younger (2001) discusses the ‘time series properties’ of IMR, using an unbalanced panel. He finds that the tests do not reject the null hypothesis of a unit root for the IMR. However, the fact that there are very few observations, per country, renders the power of the test very weak.

Most studies use control variables like incidence of poverty, literacy levels and per capita income. Some also use a regional/country fixed-effects approach to address the issues of region-specific factors that might be responsible for the observed results. One of the problems that are encountered in such exercises is one of ‘endogeneity’.

Thus using OLS technique in the following equation

$$IMR_{it} = \alpha + \beta_1 X_{it} + \beta_2 IMR_{it-1} + \beta_3 F + \varepsilon$$

where X is the matrix of other control variables and F is the region/ country specific fixed effect.

We replicate the OLS technique in our exercise and the results are reported in Table 4.4. However, variables like expenditure on health, literacy levels and poverty levels might be correlated with political competition, hence OLS would give inconsistent estimates. Thus system estimation with good instruments would provide consistent estimators of the coefficients. This is what is attempted in the empirical exercise¹⁷. A simultaneous equation system recognises that there is a relationship among economic variables, which that they might be jointly determined or the dependent variables may be correlated to each other. Since least square estimation would be inconsistent, we would require an instrumental variable estimator. The method that we use will be Two Staged Least Squares estimation.

We use pooled data for the 15 major states of India, for the period 1985-2000. The economic data are from the Reserve Bank of India's annual report on Indian State Finances. The data on social indicators like IMR are drawn from the National Human Development Report 2001 – 'The State of Human Development'¹⁸. The data pertaining to State level voter percentage and the percentage of votes accruing to the opposition have been taken from the State election data released by the Election Commission of India.

Before considering the impact of electoral competition on medical expenditures and infant mortality, we would need to control for some of the usual

¹⁷ It must be understood that most empirical research on social policy focuses primarily on expenditures on welfare undertaken by the government. This is in a sense a measurement of 'welfare effort'. However, it might be argued that unless one focuses on the quality of expenditure, the results might be inadequate. As a case in point Esping-Anderson (1985) argues: "By scoring welfare states on spending, we assume that all spending counts equally. But some welfare states, the Austrian one, for example, spend a large share on benefits to privileged civil servants" (pg 19). We in this chapter wish to distinguish between the 'means' and the 'ends' of public policy. The idea is not to negate the importance of the expenditure levels, but to also highlight in a sense the efficiency of expenditure. Thus we need a model where the developmental 'ends' and the 'means' will be determined simultaneously through the interaction of electoral competition.

¹⁸ As data for most of these indicators are available at certain points of time, the data for the interim years have been projected, by calculating the compounded growth rate between those years.

factors that would impact upon infant mortality. We consider four broad determinants of infant mortality along the lines of Masset and White (2003). These are:

(1) Biological factors – these include factors like multiple births, mother’s age and sex of child¹⁹. In the case of India, owing to absence of state-wise data, we try and proxy these factors by using the ‘availability of health professionals’ and female literacy in rural areas.

(2) Environmental factors – Respiratory disease and water borne disease like diarrhoea are the causes for a significant proportion of IMR. So the quality of air and water would be significant determinants for the levels of IMR. We consider, availability of safe drinking water as our measure of this factor.

(3) Behavioural factors – These include factors like vaccination and immunisation, which can be useful in preventing a number of disease like tetanus, measles etc. In our model we use proportion of tetanus immunisation as our variable for measuring this factor. The other behavioural factor that we need to consider is that of disparity between male and female children. This might lead to a higher proportion of infant mortality in States, where the disparity between male and female is more acute²⁰.

(4) Socio-Economic Factors – These includes factors like female literacy, income levels, poverty levels and the amount of health expenditures undertaken by the government in order to have a direct impact on infant mortality. The inference is that higher levels of female literacy, lower poverty levels and higher government expenditures in the health sector can reduce infant mortality.

¹⁹ Though it is argued that in general male children have higher mortality rates, Masset and White (2003), suggest that in India a preference for male children, leading to higher female infanticide, makes it a social problem, rather than a biological issue.

²⁰ We use the Gender Disparity Index (GDI), developed by the Planning Commission of India in its ‘The State of Human Development (2001)’. The GDI is estimated as a proportion of female attainments to that of male for a common set of variables. We drop this variable and the ‘availability of safe water’ in Table 4.1 because they are insignificant and add no further insights into our results. We use them in our OLS technique (Table 4.4) and in Table 4.5

We include variables from each of the factors along with our electoral competition variable to see its impact on government expenditures on health and its impact on IMR. The fact is that a number of these ‘factors’ are interrelated and consequently, there might be problems of multicollinearity and endogeneity in an ordinary OLS type setup. Hence, we require an equation system with good instruments to give us meaningful results.

The variables used in the regressions are:

Electoral Competition (ELCOMP)– In any democratic society, the voting pattern would determine the level of political competition. There are two components that determine the level of political competition. The first is the proportion of voters who exercise their right to vote. This component is important since it is a measure of voter ‘activism’, which means that political parties have to tailor policies, which would be agreeable to the majority of the polity (see Vanhanen (2000) for a discussion). This is important for those countries where voting is not compulsory²¹. The second measure of competition is the proportion of votes accrued by the opposition or the losers. This indicates the actual level of political competition and choice. Closely following Vanhanen (2000) we define electoral competition²² similarly. *Health expenditure per capita* (MEDPC) was calculated by dividing the expenditure on public health with the population of each State. *Infant Mortality Rate (IMR)* – defined as the number of deaths of children under 12 months per 1000 live births. *Share of Agriculture in State output* (AGRISDP). *State Output per capita Factor Cost* (SDPPC) and *Revenue Deficit Per capita* (RDPC). *Female literacy in rural areas* (FEMRURLITERACY) was

²¹ Unlike say Australia

²² It must be noted that elections in Indian States are usually held every 5 years, unless a no-confidence motion in a state legislature precipitates an early election. For our data on electoral competition we have calculated the interaction between percentage of electorate voting and the percentage of electorate voting for the parties not in power, for each election year. Since it is pooled data, the value obtained in one election has been kept the same till the subsequent electoral cycle.

included as a control variable, as was the *Proportion of births handled by health professionals* in rural areas (HEALTHPROF) (See Table 4.2 for data and its sources).

We consider IMR to be a function of electoral competition, health expenditure, poverty and other variables. However, health expenditure itself might be a function of electoral competition. Thus there may exist a simultaneity bias in the equation. This can be solved using two-staged least squares (2SLS) in a simultaneous equation system.

The model that we test is:

$$\log(imr)_{it} = \alpha_1 + \alpha_2 \log(medpc)_{it} + \alpha_3 \log(elcomp)_{it} + \alpha_4 \log(agriscdp)_{it} + \alpha_5 \log(femrurliteracy) + \alpha_6 \log(healthprof) + \alpha_7 \log(sdppc) + \varepsilon_1 \quad (1)$$

$$\log(medpc)_{it} = \beta_1 + \beta_2 \log(elcomp)_{it} + \beta_3 \log(sdppc) + \beta_4 rdpc_{it} + \varepsilon_2 \quad (2)$$

where the variables have been defined earlier²³.

We use the standard measure of health expenditure to test the predictions of the model, which is medical expenditures per capita $medpc_{it}$. We expect the coefficient of $medpc_{it}$ in equation (1) to be negative, indicating that higher medical expenditures per capita should reduce the infant mortality rate of a region. Similarly, we expect high electoral competition to also lower infant mortality because of the need for political parties to show better ‘output delivery’. Thus the coefficient for $elcomp_{it}$ is also expected to be negative. The coefficient of $agriscdp_{it}$ is expected to be

²³ We use $\log(elcomp)$, $\log(agriscdp)$, $\log(sdppc)$ and $rdpc(-1)$, urbanisation, vaccination of women in rural areas and a budgetary institution index as instruments (as they are the exogenous and pre determined variables in the system). We do a Hausman Specification test to confirm that the residuals are not significantly different from zero and hence the instruments may be considered to be valid.

positive, because share of agriculture in total output may proxy poverty²⁴ and high poverty is expected to contribute to higher infant mortality. The coefficient of $sdppc_{it}$ is expected to be negative because higher incomes should reduce infant mortality. Similarly higher female literacy ($femrurliteracy_{it}$) should also have a negative impact on infant mortality, as should the presence of more health professionals ($healthprof_{it}$).

Moving on to equation (2), as suggested by theory, higher electoral competition should make governments focus on developmental expenditures like health and sanitation. Thus the coefficient of $elcomp_{it}$ is expected to have a positive sign. The greater the per capita state output, the greater ought to be the level of medical expenditure per capita. On the other hand, the higher is the income of the people, the lesser would be their reliance on State funds, consequently, the sign of the coefficient of $sdppc_{it}$ is ambiguous. The sign of the last variable, viz revenue deficit is ambiguous. It could be argued that a higher revenue deficit would translate into higher expenditures on public health. On the other hand, a higher revenue deficit could act as a constraint on discretionary expenditures. Thus the sign of $rdpc_{it}$ is ambiguous.

Results

Tables 4.1 give the results of the econometric exercise. The results are consistent with the model. Note that $medpc_{it}$ is not significant, when imr_{it} is the dependent variable. This confirms the World Development Report (2004) assertion that increasing levels of per capita medical expenditures might have no impact on infant mortality. Why might this be the case? There could be a number of reasons,

²⁴ A positive correlation of 0.3 between poverty and share of agriculture in SDP confirms this. More generally it is well known that most of India's poor live in rural areas and are in the agricultural sector.

first public spending could be impacting on other health indicators without having an impact on child mortality. It might be the case that the composition of public spending on health is skewed towards other health services rather than primary health and finally there might be the impact of corruption or poor governance, which might be giving us this result. Another possible explanation for this counterintuitive result is that this reflects purely wasteful public expenditure. That is, merely enhancing expenditure on health has no impact on the ‘outcome’ of infant mortality²⁵. However, the key result is that higher electoral competition reduces infant mortality. Higher incomes ($sdppc_{it}$) and more health professionals have a significant and negative effect on infant mortality. This view is further corroborated in the second equation of Table 4.1, which shows that higher electoral competition has a positive impact on health expenditures. Similarly as income per capita rises ($sdppc_{it}$) it leads to an increase in per capita health expenditure as well. This suggests that economic growth is also an important determinant of IMR. The coefficient of $agrisdp_{it}$ and $femrurliteracy_{it}$ is of the right sign but is statistically insignificant, as is the case with $rdpc_{it}$.

One further issue needs to be resolved. It might be the case that the ‘health professionals’ and medical expenditures per capita are strongly correlated in the sense that the medical expenditures might be accounting for the salaries of the health professionals²⁶, which is ‘non-developmental’ from one point of view. Thus we again run our 2SLS exercise without the ‘health professional’ variable (Table 4.5). We find that now medical expenditure per capita is positively related to IMR. In other words it

²⁵ A possible explanation that is consistent with recent World Bank household surveys conducted in the state of Andhra Pradesh, is that environmental factors (such as indoor pollution, pesticide exposure and contaminated water) are the main cause of IMR amongst the vulnerable poor, and that health interventions are ultimately ineffectual when infants are consistently exposed to these risks (World Bank 2001). If this were the case, health expenditure could have no impact on IMR.

²⁶ Assuming that a significant proportion of the births carried out by ‘health professionals’ in rural areas would be employed by the state governments.

seems to corroborate the view that medical expenditure might be purely wasteful. We find that the key electoral competition results continue to hold and a number of behavioural and environmental factors become significant in explaining infant mortality.

4.5. Conclusion

This chapter explores the role of electoral competition on government policy outcomes. Our empirical research for the Indian regional government shows, what our model predicts, that increased political competition, would lead a government to prioritise more on public welfare and on ensuring better outcomes for citizens. The transmission channels of how electoral competition impacts upon the ‘outcomes’ are still unclear, as is shown by our empirical exercise, where in one case it is straight forward as a higher electoral competition leads to higher per capita health expenditures, which in turn would impact upon the ‘outcome’ of infant mortality levels. However, it appears that electoral competition does have a ‘direct’ impact on IMR levels, possibly through ensuring better management and policies. This is revealed in our empirical models, where even though health expenditure has a no impact on IMR, electoral competition appears to reduce infant mortality. We believe that these results are particularly significant in the context of developing democratic nations like India.

This conclusion is echoed in the World Development Report, 2004, where it contrasts the health and educational outcomes between Uttar Pradesh and Kerala. The report argues that “Political incentives matter for service delivery”. So Kerala had a higher level of electoral competition, which led the governments to focus on provisioning of universal basic services, and the political competition centred on such

factors. Uttar Pradesh on the other hand had a much lower degree of political competition as the electoral process there revolved mostly around caste, ethnic and class-based factors, which meant that political power was more about ‘patronage and public employment to specific clients.’

The other thing to remember is that electoral competition, while important, is not the sole arbitrator of performance in human developmental outcomes. This can be seen from Table 4.3 details, where Andhra Pradesh with lower electoral competition as compared to Bihar, has better IMR rates. However, our endeavour is to underscore the importance of the nature of electoral competition, as it would have implications on the developmental priorities of political parties and thereby have an impact on institutions and developmental outcomes.

The other conclusion that we can arrive at is a realisation that the major issue is not one of centralisation or decentralisation of government; rather it is one of the levels of political competition. To the extent that there exists multiple avenues for political competition in a decentralised world, there will be a higher probability of the electorate ensuring better outcomes. In such a situation, a decentralised system of governance is preferred to a centralised one, where there might be a ‘risk’ of a democracy ‘locking’ itself into a low competition environment and thereby getting poor outcomes for itself.

Table 4.1: 2SLS Estimation of developmental outcomes due to Electoral Competition

Dependent Variable	Independent Variables	Coefficients
Log (IMR)	Log (Medpc)	0.259 (0.92)
	Log (Elcomp)	-0.270** (-4.34)
	Log(Agrisdpc)	-0.108 (-1.60)
	Log(Sdppc)	-0.336* (-1.93)
	Log(Femrurliteracy)	-0.07 (-0.96)
	Log(Healthprof)	-0.321** (-6.97)
	Adj. R-square	0.59
	Number of Observations	225
Log (Medpc)	Log (Elcomp)	0.132** (3.26)
	Log(sdppc)	0.637** (19.57)
	Rdpc	0.0002* (2.42)
	Adj. R-square	0.87
	Number of Observations	225

Figures in brackets refer to t – statistics

** significant at 1% level or below

* significant at 5% level

Table 4.2: Source of Data used in the Empirical Exercise

Data	Source
Electoral Competition (ELCOMP)	Calculated by the Authors, using data on state level elections, published by the Election Commission of India
Percentage of Houses with safe water (SAFEWATER)	The State of Human Development, Planning Commission, Government of India
Medical Expenditure per capita (MEDPC)	Report on Finances of State Governments, Reserve Bank of India
Infant Mortality Rate (IMR)	The State of Human Development, Planning Commission, Government of India
Female literacy rates in rural areas (FEMRURLITERACY)	The State of Human Development, Planning Commission, Government of India
Percentage of births attended by health professionals in rural areas (HEALTHPROF)	The State of Human Development, Planning Commission, Government of India
State Domestic Product per capita at factor cost (SDPPC)	Central Statistical Organization, Government of India
Revenue Deficit per capita (RDPC)	Report on Finances of State Governments, Reserve Bank of India
Share of Agriculture in State Output (AGRISDP)	Central Statistical Organization, Government of India
Gender Disparity Index 1991 (GDI91)	The State of Human Development, Planning Commission, Government of India

Table 4.3: Average Values (1985 – 2000) of the Variables Used in Empirical Analysis

States	IMR	SDPPC (Rs.)	ELCOMP	MEDPC (Rs.)	AGRISDP (%)	SAFEWATER (%)	RDPC (Rs.)	FEMRURLITERACY (%)	HEALTHPROF (%)	GDI91
Andhra Pradesh	54	7354.4	0.38	66.4	28.2	43.40	104.6	21.7	41.0	0.801
Assam	90	5499.0	0.45	67.0	34.7	33.80	18.3	54.2	14.4	0.575
Bihar	74	3524.0	0.41	38.6	42.1	50.26	59.2	19.6	14.5	0.469
Gujarat	76	10080.0	0.24	81.8	18.8	62.84	137.8	38.8	33.2	0.714
Harayana	51	10677.7	0.41	70.8	37.8	66.62	159.7	34.1	24.8	0.714
Karnataka	73	7904.8	0.40	79.9	30.1	56.58	60.0	36.1	40.5	0.753
Kerala	41	8671.6	0.47	97.7	23.0	16.22	205.1	83.9	87.7	0.825
Madhya Pradesh	132	6111.0	0.32	53.7	33.9	40.12	73.5	24.0	22.1	0.662
Maharashtra	72	11401.7	0.39	80.7	16.6	58.02	145.5	43.2	37.8	0.793
Orissa	123	4888.2	0.32	55.5	32.9	29.28	161.3	33.0	17.3	0.639
Punjab	72	11914.0	0.12	106.5	43.3	89.42	378.5	45.4	45.4	0.710
Rajasthan	85	6371.9	0.33	75.9	31.5	46.18	131.1	15.5	18.5	0.692
Tamil Nadu	53	9005.9	0.41	90.7	19.2	57.68	177.5	43.1	60.7	0.813
Uttar Pradesh	97	5261.1	0.32	50.6	36.0	50.84	142.6	21.7	12.0	0.520
West Bengal	60	7345.4	0.40	71.6	27.8	76.98	205.0	39.8	24.1	0.631

IMR: Infant Mortality Rates per 1000 live Births

SDPPC: State Domestic Product Per Capita

ELCOMP: Electoral Competition

MEDPC: Medical Expenditure Per Capita

AGRISDP: Share of Agriculture in State Domestic Product

SAFEWATER: Percentage of households with Safe drinking water

RDPC: Revenue Deficit Per Capita

FEMRURLITERACY: Percent of female literacy in rural areas

HEALTHPROF: Per cent of births carried out by health professionals in rural areas

GDI91: Gender Disparity Index in 1991

Table 4.4: OLS estimates of Factors affecting Developmental Outcomes

Dependent variable: Log of Infant Mortality Rates, Log(IMR)

Variables	Coefficients
Medical Expenditures Per Capita Log(Medpc)	0.09 (1.13)
Electoral Competition Log(Elcomp)	-0.35** (-8.66)
Poverty Ratio Log(Poverty)	0.36** (5.63)
Income Per Capita Log(SDPPC)	-0.03 (-0.35)
Female Literacy in rural areas Log(Femrurliteracy)	-0.03 (-0.73)
Number of Health Professionals Log(Healthprof)	-0.33** (-6.38)
TT Vaccination in rural areas Log(TTVaccinerural)	-0.08 (-1.28)
Gender Disparity Index Log(GDI)	0.68** (6.36)
Availability of Safe Water Log(Safewater)	-0.003 (-0.07)
Adj. R –Square	0.70
No. of Observations	225

Figures in brackets refer to t – statistics

** significant at 1% level or below

* significant at 5% level

Table 4.5: 2SLS Estimation of developmental outcomes due to Electoral Competition (Excluding ‘Health Professionals’)

Dependent Variable	Independent Variables	Coefficients
Log (IMR)	Log (Medpc)	1.207** (3.06)
	Log (Elcomp)	-0.408** (-4.68)
	Log(Agrisdpc)	-0.042 (-0.43)
	Log(Sdppc)	-1.05** (-3.79)
	Log(Femrurliteracy)	-0.30** (-3.72)
	Log(Gender Disparity Index)	-0.63** (-3.34)
	Log(Safe Water)	0.02 (0.34)
	Adj. R-square	0.22
	Number of Observations	225
	Log (Medpc)	Log (Elcomp)
Log(sdppc)		0.637** (19.57)
Rdpc		0.0002* (2.42)
Adj. R-square		0.87
Number of Observations		225

Figures in brackets refer to t – statistics

** significant at 1% level or below, * significant at 5% level

5. Decentralisation and the Soft Budget Constraint

5.1. Introduction

The issue of soft-budget constraint (SBC) has been a recurring theme for most developing economies that have a significant state sector, ever since it was introduced by Kornai (1980). The SBC argument was put forward by Kornai to emphasize the inherent flaws of state-ownership of firms. Such vertical relationships allow the owner (states) to bailout a subordinate (state-owned firms). A key issue that has been discussed in the literature is the question of the motivation behind having a soft budget. While the motives behind a ‘bailee’ asking for financial support is self evident¹, the considerations of the ‘bailer’ needs a little more elaboration. Among the reasons that have been suggested, is that the State (or the superior organisation) is at times presented with a *fait accompli* of losses, lower returns etc., and is thus forced to temporarily agree to a bailout. However, bailouts by the State can often be voluntary. This is particularly the case for many developing countries, which do not have social safety nets. In such countries, inefficient firms are often allowed to exist as redundancies can lead to social and political dissatisfaction. Apart from that the bailer may be motivated by ‘reputation effects’, whereby it would be unwilling to let a firm nurtured by it, to fail. Finally, there might be aspects of ‘cronyism’, where political pressure prolongs the survival of inefficient firms.

This chapter attempts to analyse the effects of decentralisation on the SBC issue. Theoretically, a federal structure is characterised by multiple decision-making nodes. There would be a central government, a number of regional (state) governments and state owned firms – owned both at the central and the regional levels. Standard federal literature speaks of a vertical imbalance in revenue raising

¹ Kornai suggests that desire for survival is a powerful social-psychological principle.

capabilities between the centre and the regions, which is mitigated through intergovernmental transfers. The issue of SBC thus arises here at multiple levels. At one level, a state government's fiscal profligacy could be financed through discretionary transfers by the Centre. A second source of SBC could be the possibility of the respective 'owners' directly bailing out their public sector undertakings at the regional or central level. Finally, there could be an indirect transmission channel, wherein a regional public sector undertaking is bailed out by its state government owner, which in turn asks for discretionary transfers from the central government to finance this extra expenditure.

Qian and Roland (1998) argue that decentralisation increases the commitment to a hard budget constraint. The argument implicit in this statement is that a hard budget constraint is universally preferred to a soft budget constraint. The question that we attempt to address in this chapter is the following: Is it always the case that a hard budget leads to a superior outcome as compared to a soft budget? And analogously, would decentralisation automatically lead to a 'better' result in terms of budget constraints?

The maintenance of fiscal discipline is closely linked to the nature of the budget constraint. The federal system assumes vertical system of government. If the budget constraint is perceived to be 'soft', the lower tier governments or its entities believe that they will be bailed out by the higher tier governments in the event of financial difficulties. This belief is made 'credible' by the fact that the institutions/governments can force the higher tier governments into an ex post intervention. This gives rise to a moral hazard problem, wherein the lower tier governments might not have adequate incentives to maintain financial discipline. Typically while most papers attempt to justify the imposition of a hard budget

constraint through the argument of fiscal management, the normative dimension of imposing a hard budget is often ignored.

This chapter attempts to explore the problem of the soft budget constraint through its effect on aggregate welfare. It tries to assess the aggregate consequences of a bail-out, which confers benefits in the form of continued production and employment against the costs of better alternative use. It has traditionally been accepted that a soft budget usually imposes costs on the economy and therefore needs to be plugged through 'credible' threats of no bail out. It is shown in this chapter that there might exist certain conditions where it might be advisable for a government guided by welfare maximising principles to adopt a soft budget. This might be more so for developing economies like India, which has a significant government presence in many industries and particularly in natural monopolies like electricity generation, water distribution and road/rail construction. A further issue that this chapter tries to explore is the assertion that decentralisation automatically increases 'commitment' to a hard budget. We find, that under certain conditions, it might be the case that partial centralisation leads to a harder budget constraint and better outcomes, and the impact of full decentralisation on the budget is at best ambiguous.

The rest of the chapter is divided in the following manner. Section 5.2 presents a brief survey of literature on federalism and the soft budget constraint. Section 5.3 sets out a brief model regarding the interaction of two tiers of governments with regard to a bail out policy. Section 5.4 extends the model further by endogenising effort levels. The Indian federal structure and its sources of soft budget constraint is discussed in Section 5.5 and Section 5.6 concludes.

5.2. Literature Review²

The second-generation theories of federalism question the need for government officials to behave in a benevolent manner without appropriate incentives. Qian and Roland, (1998) argue that in a federal system there exist benefits, which can be harnessed through the ‘commitment’ to preserve markets, and the negative incentives towards the temptation of bailing out failures.

There has been a growing volume of research on fiscal performance of sub-national governments and economic growth. For instance, Qian and Weingast (1997) posit a positive correlation between regional indicators of development and higher fiscal incentives, measured in terms of higher retention of taxes. On the other hand, a number of studies have shown a negative correlation between decentralization and growth. This has been estimated by Davoodi and Zou (1998) by a cross-country model for developing countries, and by Fukasaku and de Mello (1997) for developed and developing countries. This however is not conclusive as there might be factors like lack of autonomy in expenditure decisions at the sub-national level, which causes this counter intuitive result.

Closely linked to this, is the question of the nature of the budget constraint of sub-national governments and its effects on economic growth. As suggested by Kornai (1980, 1986), a soft budget constraint is one where an organization expects that it would be rescued in the face of financial problems. Obviously, this creates a bias towards financial profligacy. Kornai had based his analysis on the centralised economies of Europe. Recently, economists have started studying the dual effects of decentralisation and budget constraints. In the literature, this issue has been analysed by Persson, Roland and Tabellini (1997) who have analysed the role of separation of

² Maskin and Xu (2001) provide an excellent survey of the theoretical literature on Soft Budget Constraints. We are concerned mainly with the twin effects of decentralisation and the soft budget constraint.

powers in government organizations with a view to improving accountability, Quin and Weingast (1996, 1997) on the incentive effects of federalism. Li and Liang (1998) consider the three major causes of the soft budget constraint (SBC) to be – politician’s influence on enterprise behaviour, lack of information and lack of commitment on the part of the creditors not to refinance bad projects and manager’s control rights, which have an impact on SBC. This has also been elaborated by Shleifer and Vishney (1994), when they argue that a politician in charge of a PSU might have a different objective, viz. maximising employment or output, rather than profit. Damania (2003) further argues that a firms bargaining power increases depending on it’s ‘strategic role’. Pisaruo (2001) looks at the soft budget constraint as an extension of what is known as the ‘common pool problem’. This states that sub national governments have the incentives to over spend if a major part of the resources are raised by the central government. This is due to the fact that there would exist a ‘divergence between the real and perceived costs’, which would thus exacerbate the problem. The issue is further complicated in that even if it becomes legislatively possible to assign a larger share of resources to be collected by the regional governments, they might rationally decide not to raise the revenue required to finance their expenditures and would rather expect to be bailed out by the Centre. Thus the moral hazard problem here spills over to the soft budget constraint.

In the recent literature, formal models of bailouts and decentralisation have been proposed by Dewatripont and Maskin (1995) Wildasin (1997), Carlsen (1998) Qian and Roland (1998) and Timofeev (2002). All these papers model the inter-governmental relations as a game. The game is played in the form of a bail out policy adopted by the central government laying out the conditions under which financial assistance would be provided to regional governments. The local government then has

the choice of whether or not to force a bailout after considering the associated costs of such an action.

The Dewatripont-Maskin (1995) model argues that decentralisation would increase the commitment to a hard budget constraint as increased costs of monitoring would make refinancing of projects by financial institutions an unattractive prospect. Consequently smaller or more decentralised financial institutions would attempt to select intrinsically better projects, whereas centralisation might lead to refinancing of ex-ante unprofitable projects.

In Wildasin's (1997) model there exists a central government and a number of similar local governments having the same number of households which are immobile. Each of the households consumes three goods - a pure public good provided by the central government, a private good (numeraire) and a local good which generates a positive externality. The provisioning of the goods is financed through taxation or grants by the centre. Thus the game that exists in the model is the level of local good that a regional government chooses to provide. If a region decides to provide less than the optimal level of local good, the central government might decide to bail out the locality, by providing it with extra grants, given that this good generates an externality. If the central government does this, then there exists a soft budget constraint for the states. The choice of the central government would depend on the importance of the externality and preference of the locality, weighed against the costs of a bailout by the central government. There are two major implications of Wildasin's model. First, it proves that larger regions have a greater probability of securing a bailout from the central government as compared to smaller regions. It has been argued by him that the regions are considered 'too big to fail' because there has been an inadequate level of decentralisation. Thus in other words, the larger the

number of regions, the lesser is the probability of a bailout by the central government. The second aspect of Wildasin's model is concerned with lowering the incentives for regional governments to seek a bailout. This can be done by raising the rate of matching grants for regions that are efficient.

Carlsen (1998) analysed the inter-governmental fiscal relations on the lines of a two period game between the central and regional governments. This model assumed fixed local taxes and grants from the centre determined endogenously, for regional governments. The game arises from the fact that while the governments agree on the composition and temporal distribution of spending, there is divergence on the level of spending. Thus, if the central government can show a credible restraint in bailing out regional governments, the local governments would have no choice but set a spending pattern as preferred by the central government. On the other hand, if there do not exist adequate 'central regulations' on regional spending, the local government can respond to this soft budget constraint by, either raising the second period grants by running a deficit in the first period, or appropriating supplementary grants in both periods by changing the 'spending mix' of the budget.

Qian and Roland (1998) models the soft budget constraint in a federal system in a three-tier hierarchy consisting of a central government, multiple regional governments and state/non-state enterprises. The game that is played in this model is sequential in nature. The interaction between the local government and the state enterprise depends on the choice of action of the enterprise contingent upon whether it would be able to elicit a bail out by the local government. The second aspect of the game pertains to the interaction between the multiple regional governments who compete for central grants and attracting foreign capital. The final interaction is between the regional governments and the central government regarding allocation of

grants and money creation. The major proposition of Qian and Roland's (1998) model is that budget constraints are hard if there exists adequate decentralisation and are more likely to be soft in a centralised system. This is because, assuming international capital is mobile and there is need for the regions to attract them, this creates competition among regions, which raises the 'marginal regional value of infrastructure investment'. The regional governments thus have to choose between providing increased local public goods to attract capital or to subsidise a bailout. This increases the opportunity cost of a bailout and consequently hardens the soft budget constraint. This is the 'competition effect' of federalism.

Timofeev (2002) in an empirical work considers the case of the Russian federation and argues that decentralisation had 'interfered' with the process of economic reforms. He argues that the price liberalisation process which began with the Russian federal government's initiative was weakened by the regional government, who continued to subsidise the state public sector undertakings, thereby reducing the need for raising prices.

Our model is adapted from Qian and Roland's (1998) model, which shows that decentralisation leads to an increase in the 'commitment' for the government to adhere to a hard budget constraint. As rightly suggested by them, soft budget constraint represents a problem of incentives. A soft budget constraint exists because in the vertical relation between the governments and public sector firms, the lower entity has a first mover advantage, which denies the higher entity the ability to credibly commit to a "no bail out" *ex ante*. While the unsuitability of a soft budget constraint has been analysed in the literature by a number of authors, there does exist the possibility that under certain special cases a soft budget might be the desired outcome, or even the only outcome. It is possible to argue that, if the health of a firm

depends partly on exogenous and unpredictable factors like the ‘state of nature’.

While the best outcome would perhaps always lead to a hard budget constraint, there might exist possibilities where the a hard budget constraint would induce a less than optimal effort level. Another factor that needs to be considered is that a federal structure need not automatically increase the commitment to a hard budget constraint as argued by Qian and Roland (1998).

This might have interesting implications for government policy, where there might arise the need for specific rule based policies for public sector firms to accept a hard budget constraint. On the other hand a soft budget might be a form of counter cyclical policy instrument in the hands of a government to act as insurance for a public sector undertaking in the ‘bad states of nature’.

A case in point may be made for developing economies like India, with a significant government presence in the economy. The importance of the public sector lies not only in their role as a provider of employment but also their pre-eminent position in taking control over natural monopolies like electricity and water supply. Thus, a hard budget constraint, which allows the firm to exit, when faced with loss, might not be feasible or desirable if it leads to the loss of essential services. This prior knowledge of ‘indispensability’ unfortunately might act as a moral hazard on the employees of the public sector undertakings with respect to the level of effort put in.

The model that we propose, tries to analyse the welfare effects of the hard and soft budget constraints. In the first section, the model explicitly shows that welfare levels under soft and hard budgets in a completely decentralised scenario is ambiguous. However, under a partially centralised governing system, a hard budget leads to higher welfare levels than a soft budget. In the second section, we endogenise the ‘effort levels’ of the PSU employees, and there it is possible to show, that under

certain conditions, the welfare under a soft budget is higher than welfare levels under a hard budget when the PSU provides “essential” services.

5.3. The Model

The model closely follows the structure created by Qian and Roland (1998). Where it differs from their analysis is that first, it explicitly tries to analyse the welfare effects of a soft or hard budget on a region. Secondly, unlike them, the model does not assume any competition or interaction among the regions. Third, even though initially our model assumes like Qian and Roland that the ‘effort’ levels of the public sector employees are exogenously given, subsequently we study the effect of endogenising effort. Finally, our model explicitly considers the fact that a firm might face bankruptcy due to external factors or ‘bad states of nature’ in which case we find that there might be no gains from a hard budget constraint.

5.3.1. Features

The model is three tiered – Central (one), Local (Multiple) and State/Non State Enterprises (Multiple). In the model, the role of the Central Government is entirely passive. In a completely decentralised set up, the Central government has no effective role, however, under centralisation, it exercises control over the regional governments by assigning a uniform regional tax rate³.

The government aims to maximise aggregate welfare, which is taken to be a sum of private benefits in the public sector, foreign firms, the local firms and the utility from public good provisioning.

³ Tax is uniform because the regions are symmetric.

The government and the employees are fully aware of all the payoffs and have all the information necessary to take decisions.

SBC game between governments and PSUs are sequential. Assume that economy has N identical regions and in each region there exists m PSUs and n Non State enterprises. The non-state enterprises can be further divided into two kinds. First, the foreign enterprises, which are attracted by the level of public expenditure on infrastructure (I), and are given a ‘tax holiday’ by the regions and second, the domestic non-state industries which are taxed by the government.

5.3.2. State Enterprises (PSU)

The model has two dates. At date 0 each PSU has one project, say, a power station. The return on the project can be divided into two parts. R^i accruing to the government and B^i accruing to employees. Let α be the proportion of ‘good’ PSUs, where the level of effort is high and there is no need for a bailout. α can have another interpretation as well. We can consider α to be that proportion of public sector enterprises which have similar enterprises in the private sector and may be assumed to be efficient and ‘competitive’. The $(1 - \alpha)$ proportion of ‘bad’ PSUs may be assumed to be those PSUs, which are natural monopolies, like the State Electricity Boards in the Indian context. These PSUs provide critical inputs for citizens and the non-state enterprises. The government chooses the budget allocations between investment, public good provisioning and bailouts (subsidies).

At date 1, a PSU yields (R^H, B^H) if the level of effort put in by the workers is high (e^H), but if the effort put in is low e^S and there is no bail out then the returns on the project become $(0,0)$ and the project is terminated. However, if the government

decides to bail out the PSU when effort is low,, then the returns are (R^S, B^S) . We assume $R^S < R^H$ and further assume that the returns to the employees are ranked such that $B^S > B^H > 0$. That is because of disutility of effort, workers prefer a low effort and a bailout.

5.3.3. Non State Enterprises

Assume that the supply of non-state capital is perfectly elastic and is perfectly mobile across regions. The non-state capital may be interpreted as private capital or foreign capital.

The foreign non-state enterprises emerge at date 1 with a production function $f(K_i^F, I_i)$ where K_i^F is the foreign Non State Capital and I is public infrastructure investment (both existing and new) provided by the government budget. These enterprises are assumed to have been given a ‘tax holiday’ by the regional governments to increase the attractiveness of the investment destination.

The normal assumptions hold:

$$f_K(K_i^F, I_i) > 0 \text{ (or } MP_K > 0), f_I(K_i^F, I_i) > 0 \text{ (or } MP_I > 0), f_{KK}(K_i^F, I_i) < 0$$

$$, f_{II}(K_i^F, I_i) < 0 \text{ (diminishing returns), } f_{KI}(K_i^F, I_i) > 0$$

The local non-state enterprises have a production function $h_i(K_i^R)$ and are taxed at the level τ_i . It is assumed that since the local non-state enterprises are pre-existing in the region, their production function is not dependent on the new level of public infrastructure investment (I_i).

5.3.4. Government Budget

The Government gets its revenue from taxing the public sector undertakings and the local enterprises. Government revenue accrues from a tax τ_i imposed on local enterprises and the returns of the public sector R^i , where $i = H, S$.

We consider a simplified budget with three components (1) bailout (subsidies) (2) public infrastructure investment and (3) public goods provision.

$$T_i = S_i + I_i(S_i) + z_i^4$$

Here T_i is the revenue of the government ($R^i + \tau$), S_i is expenditure on subsidizing PSUs, I_i is expenditure on new infrastructure investment and z_i is expenditure on public goods.

The budget constraint is assumed to be hard if action is e^S and there is no bailout (i.e. $S_i = 0$). It is soft if action is e^S and the PSU gets a bailout (i.e. $S_i > 0$).

We further assume that the level of subsidies would have to be sufficiently high in order to sustain the inefficient PSUs. The argument being that the employees of the 'bad' PSUs are so certain of being bailed out, that they have a large incentive to shirk, causing revenues of the PSU to fall sharply.

$$S_i \geq R^S + B^S \text{ (By assumption)}$$

⁴ Since the model also assumes that the subsidies are provided to some existing PSUs which provide infrastructure. One can also think the choice for the Government in such a case essentially to be – maintenance of existing infrastructure I_i , creation of new infrastructure I_j and public good provisions (like health etc.) z_i

$$\text{So, } T_i = I_i(S_i) + I_j(S_i) + z_i, \quad i \neq j$$

The assumptions are: $\frac{\partial I_i}{\partial S_i} > 0$, $\frac{\partial^2 I_i}{\partial S_i^2} < 0$, $\frac{\partial I_j}{\partial S_i} < 0$ and if $S_i = 0$, then $I_i = 0$

Even though we consider three discrete 'returns' to Government from the PSUs ($R^H, R^S, 0$), it is possible to consider a continuum such that $\frac{\partial R}{\partial S_i} < 0$

Thus the revenue earnings (E^i) of the government are:

$$E = E^H = \alpha R^H + \tau_i \text{ (with a HBC, since there is no bail out, all loss making PSUs}$$

would have to shut down)

$$E^S = \alpha R^H + \tau_i - (1 - \alpha)(S_i - R^S) \text{ (with a SBC)}$$

Thus $E^H > E^S$, if $S > R^S$

This follows from our earlier assumption.

5.3.5. *The Government Objective Function*

Governments wish to maximize welfare. So for each region, the objective is to maximize W_i . The central government maximises aggregate national welfare⁵

$W = \sum W_i$. We assume full employment and that the population is divided into two groups – employees in PSUs and employees in private enterprises

1. Let the total private benefits in non state foreign enterprises be x_i

$$x_i = x(K_i^F, I_i) = f(K_i^F, I_i) - K_i f_K(K_i, I_i).$$

Thus the private benefit from the foreign firms is the surplus left over after accounting for the capital costs. The private benefits are rising with increasing public investment. x_i is assumed to be a concave function.

Using the same approach let the total private benefits of non-state local enterprises be $h_i^W(K_i^R)$. We assume h_i^W is concave in K_i^R

2. Let the total private benefits of employees of State enterprises be:

⁵ We ignore subscripts on the summation term for notational simplicity.

$y_i = B^H$ or 0 if effort is e^H or e^S , respectively under the Hard Budget

Constraint, and

$y_i = B^S$ under the soft budget constraint

3. Finally, the total utility derived by both the groups from the public goods provided by the government is $u(z_i)$.

So for region i , welfare W_i is

$$W_i = x(K_i^F, I_i) + y_i + u(z_i) + h_i^W(K_i^R) \quad (1)$$

The private benefits of public sector employees are $(y = B^H \text{ or } B^S)$, where

$B^S(S_i)$ gives the functional relationship between private benefits and subsidies.

B^S increases as S_i increases, $(\partial B^S / \partial S) > 0$.

Further, K_i^F may be interpreted as non-state foreign capital, which the regional governments hope to attract through increasing public investment. The non-state regional firms K_i^R is assumed to be not dependent on existing public investment (I_i).

5.3.6. Determination of Welfare Levels under a Budget Constraint

When the budget constraint is hard, *ex ante*, the good PSU employee would exert e^H , while the loss making PSUs are shut down. When the budget is soft, some of the PSUs may exert e^S knowing that there would be a bail out. In our model, the game played in this set up is as follows. The interaction between the PSUs and the regional government leads to an equilibrium, where at date 1, the PSU employees attempt to maximise private benefits by choosing the level of e^i , given the expected

levels of S_i, I_i, z_i and τ by the governments. The soft budget constraint equilibrium is one, when the PSU employee choose e^S and is extended a bailout by the government, while a hard budget constraint equilibrium is when the employees choose e^H , or choose e^S and the government elects not to bail out the firm.

Since we assume that the effort level put in by the employees is determined at the final stage of the game, it is reasonable to assume that an employee would always choose e^H , if $S_i = 0$ and e^S if $S_i > 0$.

As opposed to Qian and Roland's (1998) model, we assume no strategic interactions among the regional government. Qian and Roland (1998) assume that the regional governments compete with each other to attract foreign capital, which is assumed to be fixed and regional governments form their budget allocations, on the basis of budget allocations of the other regions⁶.

We further assume that the non-state (foreign) capital levels are not fixed, hence there is no 'competition' among states for capital.

5.3.6.1. Hard Budget Constraint

This is where the state allows no subsidy ($S_i = 0$) and hence only those PSU's where workers put in a high level of effort survive, while others have to shut down. Thus the level of public investment (I_i) and public good (z_i) chosen to maximise welfare (W). (For derivation see Appendix B.1)

Maximise

$$W_i^{HB} = x(K_i^F, I_i^{HB}) + \alpha B^H + u(z_i^{HB}) + h_i^W(K_i^R) - \tau^{HB}$$

⁶ This is probably more realistic in the Indian context, where the public investment (I) decisions at the state level are made through discussions with a Planning Commission, which then fixes an annual plan outlay for the state, based on states own resources and central assistance.

$$\text{s.t. } \alpha R^H + \tau_i = I_i^{HB} + z_i^{HB}$$

Thus

$$\partial x(K_i, I_i^{HB}) / \partial I_i = u'(z_i^{HB}) \quad (2)$$

So equating expenditures under a hard budget to the earnings we get:

$$I_i^{HB} + z_i^{HB} = E^H \quad (3)$$

Let (I_i^{HB}, z_i^{HB}) be the solution to the hard budget allocation problem.

Where, $E^H = \alpha R^H + \tau_i$

5.3.6.2. Soft Budget Constraint

This is the case, where the employees are certain of a bail out, so in $(1 - \alpha)$ proportion of the PSUs the employees would resort to shirking by putting a low level of effort (e^S), and get a subsidy. Then, our maximisation problem becomes,

$$W_i^{SB} = x(K_i^F, I_i^{SB}) + \alpha B^H + (1 - \alpha)B^S + u(z_i^{SB}) + h(K_i^R) - \tau^{SB}$$

$$\text{s.t. } \alpha R^H + \tau_i - (1 - \alpha)(S_i - R^S) = I_i + z_i$$

where τ^{SB} is the tax level imposed on the local firms under a soft budget. (For derivation see Appendix B.2)

Thus

$$\partial x(K_i^F, I_i^{SB}) / \partial I_i = u'(z_i^{SB}) = (\partial B^S / \partial S) / (1 - \partial R^S / \partial S) \quad (4)$$

We know that $\partial B^S / \partial S > 0$, and $\partial R^S / \partial S < 0$. So $(\partial B^S / \partial S) / (1 - \partial R^S / \partial S)$ is positive.

$$\text{We further assume that } (\partial B^S / \partial S) / (1 - \partial R^S / \partial S) > u'(z_i^{HB}) \quad (5)$$

This assumption suggests that the marginal benefit to the individual from shirking is greater than the ‘discounted’ marginal utility of the public good. Similarly equating expenditures and earnings under a soft budget we get:

$$I_i^{SB} + z_i^{SB} + S = E^S \quad (6)$$

where (I_i^{SB}, z_i^{SB}, S) is the solution to the soft budget allocation.

Where, $E^S = \alpha R^H + \tau_i - (1 - \alpha)(S_i - R^S)$

Now let us consider the alternative federal structures : (1) Completely decentralised, (2) Partially decentralised.

5.3.6.3. Complete Decentralisation

Let us assume a decentralised government such that the tax rate τ and the budget allocation is determined at the local level. Let us assume that one region chooses to follow a hard budget and another region chooses a soft budget constraint. We further define τ^{HB} as the tax imposed on local capital under a hard budget constraint and τ^{SB} as the tax under a soft budget.

Now we work out the level of welfare under a HBC and an SBC

$$W^{HB} = x^{HB}(K_i^F, I_i) + \alpha B^H + u(z_i^{HB}) + h(K_i^R) - \tau^{HB}$$

$$W^{SB} = x^{SB}(K_i^F, I_i) + \alpha B^H + (1 - \alpha)B^L + u(z_i^{SB}) + h(K_i^R) - \tau^{SB}$$

We now need to show the following result.

Lemma 1: $W^{HB} > W^{SB}$, taking the earlier assumption that:

$$(\partial B^S / \partial S) / (1 - \partial R^S / \partial S) > u'(z_i^{HB})$$

Proof

From (2) and (4)

$$\partial x(K_i, I_i^{HB}) / \partial I_i = u'(z_i^{HB})$$

$$\partial x(K_i^F, I_i^{SB}) / \partial I_i = u'(z_i^{SB}) = (\partial B^S / \partial S) / (1 - \partial R^S / \partial S)$$

If $z^{HB} > z^{SB}$

then by concavity of $u'(z_i)$ it follows that $u'(z_i^{HB}) < u'(z_i^{SB})$

Hence by concavity of $x(K_i, I_i)$ it follows that $x^{HB}(\cdot) > x^{SB}(\cdot)$

We now prove the following intuitive proposition.

Proposition 1: Under complete decentralisation, where each region is allowed to set its own taxes, it is not possible to unambiguously state that welfare levels under a hard budget are greater than welfare levels under soft budget.

Consider,

$$W^{HB} = x(K_i^F, I_i^{HB}) + \alpha B^H + u(z_i^{HB}) + h(K_i^R) - \tau^{HB}$$

and,

$$W^{SB} = x(K_i^F, I_i^{SB}) + \alpha B^H + (1 - \alpha)B^L + u(z_i^{SB}) + h(K_i^R) - \tau^{SB}$$

$$\text{Comparing } I_i^{HB} + z_i^{HB} = E^H = \alpha R^{HB} + \tau^{HB}$$

$$\text{and } I_i^{SB} + z_i^{SB} = E^L = \alpha R^H - (1 - \alpha)(S - R^S) + \tau^{SB}$$

$$x^{HB}(\cdot) > x^{SB}(\cdot) \text{ and } u(z^{HB}) > u(z^{SB})$$

We know that $x^{HB}(\cdot) > x^{SB}(\cdot)$ and $u(z^{HB}) > u(z^{SB})$, but the model does not tell us anything about the level of τ . In other words, we do not know whether:

$$\alpha B^H - \tau^{HB} \geq \text{or} \leq \alpha B^H + (1 - \alpha)B^L - \tau^{SB}. \text{ Q.E.D}$$

This suggests the following conclusion: In a decentralised world, where each region can set its own taxes and under the condition

$$(\partial B^S / \partial S) / (1 - \partial R^S / \partial S) > u'(z_i^H), \text{ the level of welfare under a hard budget or soft}$$

budget is ambiguous.

$$W^{HB} \geq \text{or} \leq W^{SB}$$

This seems to suggest that in a decentralised structure of governance there might exist temporary mismatches in public goods production levels. However, it is imprudent to advocate a hard budget under these circumstances because the welfare implications are ambiguous.

5.3.6.4. *Partial Fiscal Centralisation.*

Consider next the case of partial fiscal centralisation. This is the case where the central government sets the same tax level on local firms τ for all the regions, and the regions takes all decisions regarding budget allocation towards subsidies, public goods and investment.

The welfare maximisation problem becomes,

$$\sum W_i = \sum x(K_i^F, I_i) + \alpha \sum B^H + (1 - \alpha) \sum B^S + \sum u(z_i) + \sum h(K_i^R) - \sum \tau$$

$$\text{s.t. } \alpha \sum R^H + \sum \tau_i - (1 - \alpha) \sum (S_i - R^S) = \sum I_i + \sum z_i$$

A case for centralisation must be analysed through the soft and hard budget constraint welfare levels.

5.3.6.4.1. *Soft Budget Case*

Let us consider two regions, good (g), which wishes to have a hard budget and a bad region (b), which prefers a bail out for its PSUs.

Then for region g, the welfare maximisation problem becomes, (For the derivation see Appendix B.3)

$$W_g = x(K_g^F, I_g^{HB}) + \alpha B^H + u(z_g^{HB}) + h(K_g^R) - \tau^{SB}$$

$$\text{s.t. } \alpha R^H + \tau^{SB} = I_g^{HB} + z_g^{HB}$$

For region b, it is

$$W_b = x(K_b^F, I_b^{SB}) + \alpha B^H + (1-\alpha)B^S + u(z_b^{SB}) + h(K_b^R) - \tau^{SB}$$

$$\text{s.t. } \alpha R^H + \tau^{SB} - (1-\alpha)(S_b - R^S) = I_b^{SB} + z_b^{SB}$$

Here we assume the same level of local firm taxation τ^S or both regions.

Thus the problem becomes,

$$G^{CS} = \text{Max}(W_g + W_b) \text{ s.t. } \alpha R^H + \alpha R^H - (1-\alpha)(S - R^S) + 2\tau = I_g^{SB} + I_b^{SB} + z_g^{SB} + z_b^{SB} \quad (7)$$

So,

$$\partial x(K_g^F, I_g^{HB}) / \partial I_g^{HB} = \partial x(K_b^F, I_b^{SB}) / \partial I_b^{SB} = u'(z_g^{HB}) = u'(z_b^{SB}) = 1/2 \quad (7a)$$

5.3.6.4.2. Hard Budget Case

In order to compare the welfare effects under partial centralisation, consider the other case, where both regions are ‘good’ and do not subsidise the non-performing PSUs. Let the regions be g and j. (See Appendix B.4 for the derivation)

$$W_g = x(K_g^F, I_g^{HB}) + \alpha B^H + u(z_g^{HB}) + h(K_g^R) - \tau^{HB}$$

$$\text{s.t. } \alpha R^H + \tau^{HB} = I_g^{HB} + z_g^{HB}$$

For region j, it is

$$W_j = x(K_j^F, I_j^{HB}) + \alpha B^H + u(z_j^{HB}) + h(K_j^R) - \tau^{HB}$$

$$\text{s.t. } \alpha R^H + \tau^{HB} = I_j^{HB} + z_j^{HB}$$

τ^{HB} is the level of tax in both the regions.

We now prove the following proposition.

Proposition 2: Under partial centralization, where the tax setting powers of the regional governments are revoked, there is increased commitment to a hard budget constraint.

Thus the problem now becomes,

$$G^{CH} = \text{Max}(W_g + W_j) \text{ s.t. } \alpha R^H + \alpha R^H + 2\tau = I_g^{HB} + I_j^{HB} + z_g^{HB} + z_j^{HB} \text{ ----(8)}$$

Hence,

$$\partial x(K_g^F, I_g^{HB}) / \partial I_g^{HB} = \partial x(K_b^F, I_b^{SB}) / \partial I_b^{SB} = u'(z_g^{HB}) = u'(z_b^{SB}) = 1/2 \text{ -----(8a)}$$

Note that equations 7(a) and 8(a) are identical. That is, the marginal utility levels for x and z are the same in the case of SBC and HBC under partial centralisation.

Thus, $I^{SB} = I^{HB}$ and $z^{SB} = z^{HB}$. However, under a soft budget $S > 0$, then $\tau^{SB} > \tau^{HB}$ and by assumption, $B^S + R^S < S$. It follows that

$$W^{CH} > W^{CS} \text{ Q.E.D}$$

Conclusion: Partial centralisation under certain conditions, ensure commitment to a hard budget, by the government.

The intuition behind the result is as follows. Under complete decentralisation, where each region has the option of taxing its local capital, a region might choose to impose a higher level of tax in order to finance its requisite levels of investment, public good and the bailouts. Partial centralisation, on the other hand, removes the option of arbitrarily taxing local capital. Thus any bailouts being handed out now, would be at the cost of new public investment or public goods⁷ and this lack of flexibility increases the welfare costs of a bailout.

The conclusions further lead us to believe, that if a partial centralisation still leads to bailouts, then the governments might not be making welfare comparisons for determining the nature of the budget constraint.

⁷ It must be borne in mind, that these conditions hold under the specific assumption of $(\partial B^S / \partial S) / (1 - \partial R^S / \partial S) > u'(z_i^{HB})$. Further, the model assumes that the regions cannot take recourse to debt in order to finance its expenditures.

5.4. The Model with Endogenous ‘Effort’

In the previous section, the level of effort (e^H) or (e^S) was determined by the workers at the final stage of the game, after observing the budget allocations of the government. The effort was thus exogenous to the model. In this section, we attempt to endogenise the level of effort. We closely follow the approach outlined in Brander and Lewis (1986). The sequence of events remain the same as previously, in the sense, the effort level is determined after the budget allocations are fixed by the government.

A public sector firm provides a good as a monopolist (we think here of natural monopolies such as gas, electricity and water). The government determines the revenue R that can be obtained from consumers of these services⁸. For simplicity R is assumed to be fixed, but little would change if it were assumed to depend on output flows. More reasonably assume that there is a fixed amount of service flow for which the firm is allowed to charge R .

We consider two discrete environments, first, a good state of the world, represented by the variable \bar{a} ; and the second, a bad state of the world where a firm might face bankruptcy due to exogenous factors, represented by \underline{a} . We assume that the government cannot determine whether the performance of the firm is due to the ‘effort level’ or the ‘state of the world’. It is than shown, that a hard budget constraint can in fact lead to shirking of effort on the part of the workers and can therefore lower the expected profits. This counter intuitive result is similar to the one obtained by Brander and Lewis (1986)

⁸ We currently assume the firms revenue to be at a uniform level of R not R^H or R^S for simplicity. The focus here is on deriving the effort levels employed by the PSU workers.

The firms costs may either be high (\bar{c}), or low (\underline{c}). The costs that eventuate depends partly on factors outside the control of the firm (e.g. unforeseen events) and partly on the effort level of the employees. The firm can reduce the probability of the high cost outcome by expending greater effort (e.g. efficiency enhancing reforms). The level of effort is assumed unobservable and is denoted by e . The utility cost to the individual of greater effort is given by:

$$K(e), \text{ with } K' > 0, K'' > 0 \text{ and } K(0) = 0. \quad (9)$$

Note that since e is unobservable, we assume that there is no way in which the government can reward (punish) the supplier for greater (lesser) effort.

Let $p(e)$ be the probability that firm costs will be low. We assume the following:

$$p' > 0, p'' < 0, \lim_{e \rightarrow \infty} p(e) = 1, \lim_{e \rightarrow 0} p(e) = 0. \quad (10)$$

We allow for the possibility that in the high cost state, the government may bail out or subsidise the firm which provides low effort. This is referred to as the soft budget constraint (SBC) outcome. Conversely, under a hard budget constraint (HBC) there is no bail out or subsidy for the firm and thus requires a high effort.

We make the following assumptions.

$\partial e / \partial S < 0$, effort decreases as bailout increases.

$\partial z / \partial e > 0$, as effort increases, the amount of public goods produced increase.

$u'(z) > 0, u''(z) < 0$, utility from z is a concave function.

The financial health of the PSU depends primarily on effort levels. In a bad state of the world, if the PSU is faced with a hard budget constraint, it would simply decide to

shut down. On the other hand, if the PSU has a soft budget constraint, it would be given a subsidy by the government in order to survive

For the subsequent analysis we consider a decentralised world⁹, where first we try to determine the impact of a soft budget constraint on effort levels of the PSU workers. Subsequently we compare in a static framework, the welfare levels under a hard and soft budget.

5.4.1. 'Good' State of the World

In the good states of the world, the PSUs expected payoff function is:

HBC: (No bail out)

$$E(\pi)^{\bar{a}} = R - p(e)\underline{c} - (1 - p(e))\bar{c} - K(e) \quad (11.1)$$

Thus, the expected profits of the public sector undertaking is the revenue less the probabilities of the firm costs being low or high and less the utility cost of effort.

The FOC for the choice of the level of effort e is:

$$-\frac{\partial p(e)}{\partial e}(\underline{c} - \bar{c}) = \frac{\partial K(e)}{\partial e} \quad (11.2)$$

SBC (Subsidy paid in high cost state)

$$E(\pi)^{\bar{a}} = R - p(e)\underline{c} - (1 - p(e))(\bar{c} - s) - K(e) \quad (11.3)$$

where s = subsidy. The FOC for the choice of e is:

$$-\frac{\partial p(e)}{\partial e}(\underline{c} - \bar{c} + s) = \frac{\partial K(e)}{\partial e} \quad (11.4)$$

⁹ Where the regions can choose their own tax levels

Comparing the effort levels in states of the world we find :

Proposition 3a: In good states of the world, a hard budget constraint ensures higher effort levels than a soft budget constraint.

Let e^S be the solution to (11.4) and e^H be the solution to (11.2).

Proposition 3a $e^S < e^H$.

Proof:

Rearrange (11.2) and (11.4) to get:

$$-(\underline{c} - \bar{c}) = \frac{(\partial K(e^H) / \partial e^H)}{\partial p(e^H) / \partial e^H} \quad (\text{I})$$

$$-(\underline{c} - \bar{c} + s) = \frac{(\partial K(e^S) / \partial e^S)}{\partial p(e^S) / \partial e^S} \quad (\text{II})$$

Suppose instead that $e^S > e^H$.

Then by the convexity of $K(e)$ we have: $\frac{\partial K(e^S)}{\partial e^S} > \frac{\partial K(e^H)}{\partial e^H}$ and similarly by

concavity of $p(e)$: $\frac{\partial p(e^S)}{\partial e^S} > \frac{\partial p(e^H)}{\partial e^H}$. Hence the RHS of (I) < RHS of (II). However,

the LHS of (I) > LHS of (II). Thus we have a contradiction and so Lemma 1 holds.

QED

This means that the probability that individual would make greater effort thus keeping firm costs lower, is higher in the case of a hard budget constraint. Thus the first part of the model concludes that HBC works to ensure greater efficiency or greater effort. Accordingly a central government would have an incentive *not to bail*

out the firm since the costs of bail out exceed those of no bail out. This is the usual and the best result which suggests that in the good states of the world, it is better for the government to enforce a hard budget constraint. In other words, if the government chooses not to bail out a PSU ($S_i = 0$), the employees would put in a ‘high’ level of effort. Thus a HBC leads to e^H .

Given that HBC ensures higher effort levels in good states of the world, let us analyse its effect on welfare levels in a decentralised world. Let us consider the case of complete decentralisation, where two regions (g and b) choose their budget allocations and their tax levels.

Let us further assume that the tax levels on local capital τ is a function of the costs of PSUs. $\partial \tau(c) / \partial c > 0$. So a region would have to tax local capital more, in order to finance a high cost PSU.

So, $\tau(\underline{c}) = \tau^{HB}$ and $\tau(\bar{c}) = \tau^{SB}$, where $\underline{c} = c(e^H)$ and $\bar{c} = c(e^S)$

and $\tau^{SB} > \tau^{HB}$

Now in the two regions, Assume that the region, which imposes a HBC, has a high level of effort (from Proposition 3a), and given that the state of the world is ‘good’, all the firms are forced to become ‘good’.

Proposition 3b: Welfare levels under the hard budget constraint are higher than the welfare levels under a soft budget constraint in good states of the world.

The welfare maximisation problem then becomes

$$W^{HB} = x(K_i^F, I_i^{HB}) + B^H + u(z_i^{HB}) + h(K_i^R) - \tau^{HB} - \text{HBC}$$

$$W^{SB} = x(K_i^F, I_i^{SB}) + \alpha B^H + (1 - \alpha) B^L + u(z_i^{SB}) + h(K_i^R) - \tau^{SB} - \text{SBC}$$

Using this, it can be shown that $W^{HB} > W^{SB}$ given $B_S^L / (1 - R_S^L) > u'(z_i^{HB})$ QED

(Derivation in Appendix B.5)

Hence if effort level is endogenised, and the tax on local private sector firms are assumed to be a function of the cost structure of the PSU, the welfare levels are higher in the case of a HBC, for a completely decentralised case¹⁰ in a good state of the world.

5.4.2. 'Bad' State of the World

To consider a situation, where a bailout is a viable option, one must bring in the notion of bad states of the world, where exogenous factors can threaten a firm with bankruptcy.

Arguably, a bail out becomes essential only when costs are so high that the supplier is rendered insolvent. To take account of this, we assume now that $\bar{c} > R$. We assume that under a SBC the government is prepared to just cover this deficit. Thus $s = \bar{c} - R$. Under a HBC the government allows the firm to go bankrupt.

Now the payoff functions are modified as follows:

HBC Case: (No bail out)

$$E(\pi)^a = p(e)(R - \underline{c} - K(e)) + (1 - p(e)).0 \quad (12.1)$$

¹⁰ The results would also hold for the partially decentralised scenario.

In other words, a firm which has a HBC imposed on it, only considers the ‘good’ states of the world, and therefore when faced with bankruptcy, the firm would shut down immediately, consequently there are no further costs or disutility from work.

The FOC is:

$$\frac{\partial p(e)}{\partial e}(R - \underline{c} - K(e)) - p(e) \frac{\partial K(e)}{\partial e} = 0 \quad (12.2)$$

SBC Case: (Subsidy Paid)

$$E(\pi)^a = p(e)(R - \underline{c} - K(e)) + (1 - p(e))(R - \bar{c} + s - K(e)) \quad (12.3)$$

where $s = \bar{c} - R$.

The FOC is:

$$\frac{\partial p(e)}{\partial e}(R - \underline{c}) - \frac{\partial K(e)}{\partial e} = 0 \quad (12.4)$$

We now show:

Proposition 4a: In bad states of the world, a hard budget constraint leads to lower level of effort than a soft budget constraint.

Let e^{H^*} be the solution to 12.2 and e^{S^*} be the solution to 12.4

Proposition 4a $e^{S^*} > e^{H^*}$.

Proof

So, Rearranging 12.2 (HBC) $\frac{\partial K(e^{H^*}) / de^{H^*}}{\partial p(e^{H^*}) / de^{H^*}} = \frac{(R - \underline{c} - K(e))}{p(e)}$ (III)

For SBC,12.4 $\frac{\partial K(e^{S^*})/\partial e^{S^*}}{\partial p(e^{S^*})/\partial e^{S^*}} = R - \underline{c}$ (IV)

Suppose instead $e^{H^*} > e^{S^*}$

Then by convexity $\frac{\partial K(e^{H^*})}{\partial e^{H^*}} > \frac{\partial K(e^{S^*})}{\partial e^{S^*}}$ and by concavity $\frac{\partial p(e^{H^*})}{\partial e^{H^*}} < \frac{\partial p(e^{S^*})}{\partial e^{S^*}}$

Thus $\frac{\partial K(e^{H^*})/\partial e^{H^*}}{\partial p(e^{H^*})/\partial e^{H^*}} > \frac{\partial K(e^{S^*})/\partial e^{S^*}}{\partial p(e^{S^*})/\partial e^{S^*}}$

But RHS of (IV) > RHS of III, since $K(e) > 0$ and $0 < p(e) \leq 1$, thus it is not true, so the lemma holds. QED

HBC now does not work to ensure greater efficiency. We shall now see that a government would have no incentive to commit to the no bail out option as the efficiency costs of no bail out exceed those of a bail out.

The intuition behind the result is similar to the Brander and Lewis (1986) reasoning where they suggested that the output decisions of a firm are conditioned upon the states of the world. Thus in their model in ‘bad’ states of the world “perverse” behaviour is also observed. In our model too, a PSU employee’s behaviour would be conditioned in part by the ‘state of the world’ (a, \bar{a}) . The argument is that an employee would exert lower effort in bad states of the world and higher effort in good states of the world. Thus the only way to ensure a higher effort on part of the employees in a ‘bad’ state, is to agree to a bailout, thereby converting it temporarily to a better state of the world. In other words, when threatened with bankruptcy, workers have no incentive to consider outcomes in the ‘bad’ state of the world. Responses are therefore only conditioned on incentives in the ‘good’ states.

Since monopoly PSUs are shielded from shareholder pressures, there might be multiple causes of poor performance of the PSUs, viz. external shocks, poor management, political interference, or ideology. Under such circumstances, when it becomes impossible to distinguish the PSU performance as ‘bad luck or bad management’ (Brander and Lewis (1986), p 969), the welfare maximising outcome would suggest the need for a soft budget constraint in a ‘bad’ state of the world.

Given that the employees of ‘good’ firms might put in a low level of effort since they ignore the poor state of the world and the bad firms would be forced to shut down due to a hard budget, we now need to work out the welfare effects of a hard budget vis-à-vis a soft budget scenario.

Recall that with bankruptcy, it is the hard budget constraint, which leads to shirking. Thus, the employees of firms facing a hard budget to shirk and put in an effort level $e^{H^*} < e^{S^*}$ and the PSU earns a return R^{H^*} , which is lesser than R^{S^*} , which is the return of the firms which get a subsidy. Since $e^{H^*} < e^{S^*}$, it follows that the private benefits of PSU employees would be $B^{H^*} > B^{S^*}$.

In an extreme case, we assume that in bad states of the world, when the firms are facing bankruptcy, a HBC would ensure that all PSUs are forced to shut down.

Proposition 4b: A hard budget constraint may lead to lower levels of welfare in society, if the firm is faces bankruptcy or is in a ‘bad’ state of the world and is not bailed out.

Therefore our problem for the HBC region becomes:

Maximise

$$W_i^{H^*} = x(K_i^F, I_i^{H^*}) + h(K_i^R) - \tau^{H^*} \quad (13)$$

$$\text{s.t } \tau_i^{H^*} = I_i^{H^*}$$

Substituting and differentiating w.r.t $I_i^{H^*}$ and S

$$\frac{\partial W_i^{H^*}}{\partial I_i^{H^*}} = x'(K_i^F, I_i^{H^*}) - 1 = 0 \quad (13a)$$

$$\frac{\partial W_i^{H^*}}{\partial S_i} = 0$$

In the case of the region which has a SBC, where the PSUs gets a subsidy leads to their employees exerting a higher (e^{S^*}) level of effort, and generate higher taxable returns of R^{S^*} . The subsidy ensures higher expected returns for the PSUs.

Then, our maximisation problem for SBC becomes,

$$W_i^{S^*} = x(K_i^F, I_i^{S^*}) + (1 - \alpha)B^{S^*} + u(z_i^{S^*}) + h(K_i^R) - \tau_i^{S^*} \quad (14)$$

$$\text{s.t. } \tau_i^{S^*} + (1 - \alpha)(R^{S^*} - S_i) = I_i^{S^*}$$

Substituting and differentiating w.r.t $I_i^{S^*}$ and S ,

$$\frac{\partial W_i^{S^*}}{\partial I_i^{S^*}} = x'(K_i^F, I_i^{S^*}) - 1 = 0$$

$$\frac{\partial W_i^{S^*}}{\partial S_i} = (1 - \alpha)\partial B^S / \partial S + \frac{\partial e}{\partial S} \frac{\partial z}{\partial e} \frac{\partial u(z)}{\partial z} + (1 - \alpha)(\partial R^S / \partial S - 1) = 0$$

In the bankruptcy case, $\partial e / \partial S > 0$, so increase in subsidy leads to higher effort, and consequently $R^{S^*} > S$.

Comparing the two cases it can be proved that $W^{S^*} > W^{H^*}$ (derivation Appendix B.6)

Hence in bad states of the world, where the employees of PSUs that face a hard budget have an incentive to shirk, so an SBC might lead to an increase in welfare as compared to HBC,

This is the typical dilemma in a federal system, for public sector undertakings where the bankruptcy costs are too high, having a hard budget constraint might leave one worse off.

5.5. Sources of Soft Budget Constraint and Interpreting the Indian Experience

The above analysis provides us with two insights. First, decentralisation is not automatically correlated with an imposition of a hard budget constraint and second, in a normative sense, a soft budget might be a preferred alternative under certain circumstances.

The Indian federal system has the attributes of both a centralised economy and a decentralised federal system. The former is evidenced by the fact that most of the effective taxation powers rests with the Central government, the significant dependence of the regional governments on transfers from the Centre, the domination of centrally owned financial institutions and the constitutional bias towards the central government. On the other hand the 1980s and 1990s have seen progressive movements towards decentralisation, particularly in the area of expenditures, with state and local governments accounting for over 50 per cent of the total government expenditures. A dispassionate analysis of fiscal prudence would argue that a hierarchical structure of government is perhaps best suited to imposing hard budget constraint. However, often, political realities prevent this from happening.

The States responsibility in raising resources and towards fiscal management has only recently come into focus. This has meant that there has been a long established tradition of States understating their resource capacity *ex post*, in order to qualify for increased transfers. Theoretically, if resources could only be raised through taxes, there would automatically exist a hard budget constraint. In the Indian

scenario, for the states the resource avenues that exist include – shareable taxes collected by the Centre, grants and loans from the Centre. The fact that the Central Government monitors the loans to the states gives one the illusion that states face a hard budget constraint. However, this hides the fact that states have often been able to circumvent the centre's control in an *ex post* sense and given the absence of a no bail out policy, are able to soften their budget constraints by raising the spectre of bankruptcy. In the system of transfers adopted by the Indian federal system, the structure of the statutory transfers of taxes and grants have often been criticized because of the element of 'gap filling' underlying the system. Unlike the Australian system where the 'gaps' of the regional governments are measured by calculating the revenue capacity of each state and the expenditure requirement being that level, which would provide a uniform level of public services across the regions, the Indian system follows the Financial Commissions assessment of the revenue gap for each state and then provides them with the resources to meet this gap. Not surprisingly, such actions provide a bias towards higher revenue deficits in the hope of getting increased grants. Such perverse incentives would naturally have the effect of softening the budget constraints at the lower tiers of government.

Another factor, which softens the budget constraint, is the mechanics of budget formulation. The Indian budgetary exercise involves not only the demarcation of the budget into a revenue and capital account, but also a Plan and Non-Plan account. This distinction dates back to the 1950s when the Central Government started allocating funds to the States for specific projects determined by the Planning Commission, which was a quasi-constitutional body. The distinction was made to differentiate between the new projects that were to be funded in a financial year including their running costs during the setting up of the project would be designated

as plan funds and the recurring costs after the plan period would be financed through the non-plan mode. The Planning Commission transfers to most of the states were on the basis of loans constituting 70 per cent of the transfers while the other 30 per cent were grants. This was done on the assumption that 30 per cent of the resources in a project would be allocated for current account expenditures while 70 per cent would be used for returns generating capital expenses. However, overtime states have started using the plan funds, i.e. investment funds, for financing their revenue expenditures, such that almost half the plan funds are actually used for current account expenditures. Thus multiple and often uncoordinated avenues of resource transfers, viz. Finance Commission, The Planning Commission and Central Ministries affect proper monitoring of resource capacity of and resource utilisation by the regional governments.

Thus institutional weaknesses and political considerations are tied together leading to a softening budget constraint at the State level. The rising committed expenditures of the governments, primarily due to their opting the softer option of borrowing, rather than the politically harder option of augmenting revenues through taxation to finance their expenditures, have led to further lack of manoeuvrability over their spending patterns. Another issue pertains to the salaries of government employees. The Central government decides the compensation levels of its employees through setting up a "Pay Commission" every ten years. Most of the state governments have over time linked the pay scales of the Central Government. The Fifth Pay Commission in 1995 recommended an increase in the salary level of about 30 per cent on an average in conjunction with a 30 per cent reduction in government employment levels. However, while the former action was taken up the latter was never implemented. This had a demonstration effect on the State Governments, which

were forced to undertake a similar exercise. The employment levels of the State Government are higher than the Central government. This meant a higher expenditure burden for the States. The States were also confident that the Centre would bail them out, should a crisis of payment occur.

As suggested by Rodden *et al*(2000) commitment to fiscal discipline is ‘the most serious challenge to macroeconomic stability and efficiency in decentralised system.’ Typically, a decentralised system of governance may be referred to as one which involves increased financial and legislative autonomy to the lower levels of government. Thus in the Indian case, the states have enjoyed the benefits of determining the level and composition of spending, but are not fully responsible for funding these expenditures.

The budget making exercise undertaken by the regional/ central governments seem to contain within it the seeds of the soft budget constraint. First of all, there is no emphasis on fiscal marksmanship, so a government (regional or central) may not adhere to its projections as per the budget, thereby undermining the whole point of the exercise.

It has been argued that the revenue efforts of the states have been weak due to the twin effects of political expediency and the lack of a credible commitment by the Centre to a ‘no bail out’ policy. As argued earlier in our model, given bankruptcy constraints, adhering to a hard budget constraint increases welfare costs, so a commitment to HBC cannot be credible. This issue seems to have been exploited in the Indian federal context.

For the state governments the imbalances between expenditures and revenues have continued over time. The sluggish revenues of state governments are not only due to the fewer options with the state governments for revenue collection, but also

due to the inability and unwillingness of the states to exploit these avenues. Thus user charges and tariffs for electricity and water have not been revised, cost recovery in other public services remain low, subsidies on the other hand continue to rise. The public expenditure policies of successive governments have not been effectively monitored, the inability of the auditing systems to force effective compliance have led to the further weakening of finances. These effects appear to stem from the non-enforceability of a hard budget constraint.

Apart from this, there exist institutional mechanisms in the Indian federal context, which in effect weaken the budget constraint. One such mechanism is through the public accounts of the government. The public accounts of the government refer to that function of the government where it acts as a banker by accepting deposits from the public in the form of small savings and repaying them with interest. Prior to 1998-99, these small savings used to be the direct liabilities of the Centre and the 75 per cent of the small savings which were on lent to the states, used to reflect in the states budget as loans from Centre. Since 1998-99, there has been a change in nomenclature through the setting up of a National Small Savings Fund, which acts as a pool from which 80 per cent of the resources are distributed to the states and the balance to the Centre. This has had the effect of reducing the fiscal deficit of the Centre, though the ultimate liability of repaying these borrowings and the interest thereon lies with the central government. The fact that these small savings bear a significant interest rate and allows income tax concession, makes it attractive to the public, besides there is no legal way through which the central government can refuse accepting small savings from the public. The effect this has had is that given the 'fiscal myopia' on part of the states they utilize these resources regardless of their future costs. Similarly, a number of states often use the state public sector

undertakings to float bonds to raise resources for infrastructure. These bonds are usually guaranteed by the state governments. This ensures that resources are easily collected but at the cost of burgeoning contingent liabilities. A final method of circumventing the ex ante hard budget constraints imposed by the Centre is the ways and means advances (WMA) and overdraft facility allowed by the Reserve Bank of India to the state governments. A number of states which have been facing fiscal stress have resorted to rolling over of their WMA and overdrafts just adequately enough to escape suspension of payments by the Reserve Bank.

Apart from this the state level governments seem to believe, with some justification that the threat of a no-bail out by the Central government is not credible, thus a potential deficit or a default would be bailed out by The Central government or one of its agencies. This has led the lower tier governments in the Indian union to adopt risky strategies or has led it to the moral hazard of not ensuring fiscal prudence. A case in point might be that of natural monopolies like the State Electricity Boards (SEBs), where high level of agricultural subsidy has led to significant losses for SEBs which have not been compensated for by the state governments. This meant that the only way these firms were to continue to function was if the governments were “willing to extend a regime of soft budget constraint” to them almost indefinitely. However such a regime brought with it the negative externalities of poor productivity, large losses in transmission and distribution and poor monitoring leading to power thefts. Here, we are faced with a ‘state of the world’ problem as discussed in our theoretical model. It is not possible to predict that whether political interference in the determination of pricing policies of the SEBs or poor ‘effort’ by the employees safe in the knowledge of their monopoly status have led to the poor performance of these SEBs. But it is clear that allowing them to exit the market if it makes losses, in a

situation where the ‘pricing’ and ‘subsidies’ are politically determined, will lead to far lower effort on the part of the workers. Under these circumstances, it may be argued that an SBC regime is preferable.

Our analysis of the budget constraint problem in the Indian case, appears to suggest that the SBC has crept into the system despite the existence of a decentralised structure. While generally agreeing upon the importance of HBC, we have argued that under certain circumstance, particularly relating to State PSUs, it is possible to make a case for an SBC.

However, most of our discussion in this section focused on the existence of a federal structure. The question that needs to be asked is that, can one make a case for the Central Government extending a regime of SBC to a lower tier government. It must be said that it is difficult to justify such bailouts. On the other hand, in the Indian context, we can refer to the so called ‘Special Category States’¹¹. These states are situated in remote hilly areas and are relatively less accessible, have lower levels of economic and human development and consequently have lower resource raising capacity. In such a situation the central government effectively bails them out by providing highly concessional grants, which are not available to the other states. Here again is an example of a soft budget ensuring some level of effort on part of the government machinery, whereas a hard budget would lead to no effort.

5.6. Conclusion

In sum, this chapter provides some new insights into the issue of soft budget constraints in a federal system. It is also argued here that a soft budget constraint

¹¹ These include the states of Assam, Manipur, Meghalaya, Arunachal Pradesh, Mizoram, Nagaland, Tripura, Himachal Pradesh, Sikkim and Jammu and Kashmir.

might not be inherently destabilising because of the welfare implications. On the issue of decentralisation and the nature of budget constraints the results tend to be different as compared with the traditional paradigm. It is suggested here, that in welfare terms the desirability of a hard or soft budget under complete decentralisation is at best ambiguous. On the other hand, under partial centralisation, it is shown that a hard budget leads to a superior outcome in welfare terms. However in the case of where the alternative to a no bail out is bankruptcy (bankruptcy constraints), the hard budgets are neither credible nor desirable from the efficiency point of view.

A factor which deserves increasing focus in the context of a budget constraint is the issue of a political ‘race to the bottom’. In a democratic society, a political party depends on the votes of its citizens for retaining power. The key issue is whether a voter as a receiver of public goods and services has an incentive to punish a fiscally irresponsible government. As suggested by Rodden *et al* (2000) that a voter might prefer fiscal profligacy and increased borrowings if they believe that the future generations would inherit the cost of servicing this mismanagement. Similarly, under partial decentralisation, it is possible that regional politicians might try and exploit the perceived lack of autonomy as the reason for regional non-performance. Therefore, it becomes increasingly necessary to incorporate political dynamics to fully understand the implications of a soft budget constraint.

While our model in the earlier section deals with a static scenario, giving a dynamic spin to the entire exercise might mean that a persistent soft budget might lead to the states making poor inter-temporal choices and thereby distorting the composition of expenditures at the State level.

It is also important to appreciate the normative implications of an SBC, rather than being judgemental about the nature of budget constraint. The preponderance of

SBC in all forms of governing systems appears to suggest that one should not be dismissive about its welfare implications.

6. Concluding Remarks

What can we say at the close of our selective analysis of Indian regional economies? First, it would appear that given the level of diversity in India, both in terms of ethnicity and economic performance, the continuation of a federal structure of government is necessary.

One major issue in a federal system is that of resource generation. Traditional analysis of tax assignment suggests that progressive income and expenditure-based taxes should be retained at the central level while destination based or property taxes should go to lower level entities.

However, what makes the Indian federal fiscal system 'deficient' in a certain sense is that there is a significant imbalance between the taxing powers and expenditure responsibilities. This, apart from other issues like poor allocative efficiency, inadequate safeguards against tax exports and low base may be considered to be the source of most of the problems in state finances. The other issue is more fundamental, in that we need to ask as to what determines the developmental policy paradigm of a state in a federal structure? Following from that, what is it that leads a government to be more 'efficient' than the other and how could one measure this efficiency?

We consider the fundamental issue first. The first essay (chapter 2) suggests that the development process in India is marked by states that have made rapid strides towards development and others that have stagnated. There is a growing consensus that this diverging pattern of progress is a consequence of policy choices, suggesting the need to examine the political and economic incentives of policy makers at the state level. Chapter 2 has attempted to fill this gap in the literature by investigating the link between appropriable resource rents in a state and the consequent policy

choices of state governments. The analysis predicts that political accountability plays a key role in determining the structure and efficiency of institutions and policy choices. States with high resource rents and low levels of political accountability are predicted to have weaker institutions and experience lower levels of development. The empirical tests strongly substantiate these conclusions.

However, we must carefully consider some caveats here. First, it is necessary to come up with a more nuanced measurement of political accountability. As we have argued in the second chapter that political competition, which we use as our proxy for political accountability, might be an inaccurate and even a perverse measure outcomes, if it is contingent on non-economic factors. Thus what we are essentially seeking in terms of institutional reform is a movement towards a tighter integration of political and economic decision-making.

Turning next to the focus of the issue of state government finances in our second essay (chapter 3). Given the mismatch in state level budgets, it is generally conceivable that this deficiency is made up through resource transfers from the central government. This primarily gives rise to two sets of problems. First, that the states might not try to use their own revenue generating capacity to raise resources and instead would attempt to 'free ride' on the common pool of federal transfers. This might lead to lower accountability and therefore give rise to 'soft budgets'. The second issue is that given a multi level governmental system, what factors would determine proper fiscal management by the lower level government? One of the factors would be the 'fiscal institutional' setup of each state government. The other could be the kind of political alignment. This essay explores the implications of political alignment and institutional quality on fiscal management in India. We define fiscal management as the process governing the deficit levels achieved by the state

governments. We also attempt to explore whether political alignment leads to higher transfers to the states, thereby exacerbating the soft-budget constraint problem. We find that better fiscal institutional setup lead to better fiscal management and alignment does soften the budget constraint of ‘friendly’ state governments. A further important contribution of this paper is the creation of indices to measure various political variables and aspects of fiscal institutional quality in Indian states. Here too, we are aware of some of the shortcomings of our exercise. First, an index creation is fraught with difficulties and is necessarily somewhat arbitrary. Though we have tried to prove the robustness of our exercise by assigning different weights to our index components and still getting significant results, we are aware that without certain rule based fiscal policies, the temptation for politicians to undermine fiscal institutional setup is strong. In the second part of this chapter where we consider the political aspect of federal transfers, here too we hesitate to make too strong a point in our results. As we had pointed out earlier *ad hoc* transfers can be based on genuine needs. It might be entirely ‘fortuitous’, that the states in ‘need’ also happen to have the correct political alignment, though this is unlikely. Thus in order to assess the genuineness of the need, it is perhaps important to create a measure of ‘fiscal capacity’ of each state, along the lines of the fiscal equalization process undertaken in Australia or Canada. This measure should clearly be able to identify the total resource generating capacity of the State, if it fully utilises all it’s taxation powers. This is something, which has been overlooked by subsequent Finance Commissions set up in India.

This brings us to our next fundamental question, discussed in the third essay (chapter 4). Here we ask the basic question as to what would lead to an increase not merely in the *level* of government expenditure, rather in the *efficiency* of public

expenditure. There is a growing literature on the effect of electoral competition and democratic participation on issues such as corruption and government policy. This paper studies the effects of political competition and democratic participation on welfare outcomes. We develop a model to assess the effects of electoral competition on human developmental outcomes and empirically test the key predictions using data on infant mortality rates (IMR) in India. The empirical results provide strong support for the theoretical conjectures, which suggest that high electoral competition and high citizen participation in elections, rather than health expenditures, can explain much of the variation in IMR across different states in a democratic country like India. Here again we need to consider the deficiencies in our analysis, which should be considered as an agenda for future research. The primary factor is that ‘political competition’ is an imperfect measure of ‘political accountability’, because as argued earlier, political competition based on caste, ethnicity, religion – on which the electoral results hinge in a number of states, might not be beneficial. Second, it is difficult to quantify the transmission channels of the impact of political competition on human development outcomes. This probably needs greater elucidation in future work.

The final essay (chapter 5) revisits the concept of the ‘Soft Budget Constraint’ that was cursorily discussed in the second chapter. An area in the fiscal federal literature that has received scant attention, particularly in reference to developing economies, is the financial crises facing public sector undertakings and the response of governments therein. The fact that government owned Public Sector Undertakings (PSU) are persistently bailed out due to their perceived indispensability, gives rise to the need to analyse this phenomenon in some detail. This paper approaches the issue of fiscal bailouts for PSUs in a novel way, where it assesses the decision of whether or not a PSU ought to be bailed out, depends on an aggregate welfare maximising

criterion. For reasons of analytical tractability political economy considerations are completely ignored. The theoretical model set out in the paper shows that under certain conditions, a partially centralised government might be more inclined towards fiscal rectitude, whereas a decentralised government would be ambiguous about whether a PSU ought to be bailed out. The paper further demonstrates that if the PSUs are faced with bankruptcy, contrary to the accepted premises, a bail out might in fact be the preferred welfare maximising outcome. Here again we are faced with a question of beliefs. We have perhaps an elegant theory, but lack of data makes it impossible to empirically refute or defend the conclusions.

Thus in the end the objective of the exercise has been to highlight some of the critical factors in regional level development in India. It is reasonable to conclude that the final arbitrator of regional development is political-economic incentives. The citizens of India will have to make choices regarding the determinants of political competition. This will also be the key factor which will help determine institutional quality and thereby the path of development undertaken.

It is perhaps fitting to end with Amartya Sen's (1984) conclusions that growth and development are not the same, because growth is an aggregate measure and therefore hides the 'entitlements' of people. Thus his prescient comments that "a study of entitlements has to go beyond purely economic factors and take into account political arrangements that affect people's actual ability to command commodities". This is necessarily the direction to go for researchers.

Appendix A: Appendix to Chapter 2

A.1. Comparison of the political equilibrium and the welfare maximising equilibrium

A.1.1. Proposition 1a:

Welfare is defined by $W = U + \Pi$. Using the budget constraint (3b), and substituting for U and Π :

$$W = (1 - \alpha)R - c(I) - e^s(L^s, \beta(I)) - e^m(L^m) + PQ(L^m, M(L^s, \beta(I))) \quad (A1)$$

The first-order-conditions in the welfare maximising equilibrium are:

$$\frac{dW}{dw^s} = \left(\frac{dw^m}{dw^s} \frac{dL^s}{dw^m} + \frac{dL^s}{dw^s} \right) \left(-\frac{\partial e^s}{\partial L^s} + P \frac{\partial Q^m}{\partial L^m} \right) + \quad (A2)$$

$$\left(\frac{dL^m}{dw^s} + \frac{dw^m}{dw^s} \frac{dL^m}{dw^m} \right) \left(P \frac{\partial Q^m}{\partial L^m} \frac{\partial M}{\partial L^s} + P \frac{\partial Q^m}{\partial L^m} - \frac{\partial e^m}{\partial L^m} \right) = 0$$

$$\begin{aligned} \frac{dW}{dI} = & -\frac{\partial c}{\partial I} - \frac{\partial e^s}{\partial I} + P \frac{\partial Q^m}{\partial L^m} \frac{\partial M}{\partial I} - \frac{\partial e^s}{\partial L^s} \frac{dL^s}{dI} - \frac{\partial e^s}{\partial L^s} \frac{dL^m}{dI} \\ & + \frac{de^m}{dL^m} \frac{dL^m}{dI} + P \frac{\partial Q^m}{\partial L^m} \frac{dL^m}{dI} = 0 \end{aligned} \quad (A3)$$

From equations (6a) – (6c) in the political equilibrium the first-order-conditions are:

$$\frac{dG}{d\alpha} = R(1 - \eta(I))(f(W) - \alpha f'(W)R) = 0 \quad (A4)$$

$$\frac{dG}{dI} = \alpha R \left[-f(W) \frac{\partial \eta}{\partial I} + (1 - \eta(I)) f'(W) \frac{dW}{dI} \right] = 0 \quad (A5)$$

$$\frac{dG}{dw^s} = \alpha R(1 - \eta(I)) f'(W) \frac{dW}{dw^s} = 0 \quad (A6)$$

From (A1) in the welfare maximising equilibrium: $\frac{dW}{d\alpha} < 0$ and it follows that that α

$= 0$ in the welfare maximising equilibrium. Turning next to a comparison of

equilibrium wages, note that by assumption: $0 > (1 - \eta(I)) < 1$ and $f'(W) > 0$. Hence,

(A6) is satisfied only if $\frac{dW}{dw^s} = 0$. Consider next institutional levels. In (A5)

$f(W) > 0$ and $\frac{\partial \eta}{\partial I} > 0$ by assumption, hence the equality is satisfied only if $\frac{dW}{dI} > 0$.

Let I^p be the equilibrium level of I that satisfies (A5). On the other hand, in the

welfare maximising equilibrium, $\frac{dW}{dI} = 0$. Let I^w be the welfare maximising

equilibrium level of I . By the second-order conditions $\frac{d^2W}{dI^2} < 0$, hence by concavity

of the welfare function it follows that $I^w > I^p$.

A.1.2. Proposition 1b:

Consider equations (A4) – (A6). As the level of political accountability increases, then f' rises. Thus as $f' \rightarrow \infty$, then $\frac{dG}{d\alpha} \rightarrow -\infty$, and hence $\alpha = 0$.

Consider next equation (A5) as $f' \rightarrow \infty$ then the terms $(1 - \eta(I))f'(W)\frac{dW}{dI}$ dominate the expression and hence (A5) is satisfied if $\frac{dW}{dI} = 0$ (since $(1 - \eta(I))f'(W) > 0$).

A.1.3. Proposition 2:

Differentiating (A4) – (A6) yields the following cross- partial derivatives:

$$G_{\alpha w^g} = \frac{dW}{dw^g} (f' - f''R) = 0 \quad (\text{since } \frac{dW}{dw^g} = 0).$$

$$G_{\alpha I} = \frac{dW}{dI} (f' - f''R) > 0 \quad (\text{since } \frac{dW}{dI} > 0 \text{ by proposition 1b and by assumption } f' > 0, f'' < 0).$$

$$G_{I w^g} = (1 - \eta) f' \frac{d^2W}{dI dw^g}. \text{ Note that as } f' \rightarrow 0 \text{ then } G_{I w^g} \rightarrow 0.$$

$$G_{\alpha R} = \frac{dW}{dR} (f' - f''R) - \alpha f' \leq (>) 0. \text{ Note that as } f' \rightarrow 0 \text{ then } G_{\alpha R} \rightarrow -\frac{dW}{dR} f''R > 0.$$

$$G_{w^g R} = 0$$

$$G_{IR} = \frac{dW}{dR} \left(-\frac{\partial \eta}{\partial I} f' + f''(1 - \eta(I)) \frac{dW}{dI} \right) < 0$$

Totally differentiating the system (A4) – (A6):

$$\begin{bmatrix} G_{\alpha\alpha} & 0 & G_{\alpha I} \\ 0 & G_{w^g w^g} & G_{w^g I} \\ G_{\alpha I} & G_{w^g I} & G_{II} \end{bmatrix} \begin{bmatrix} d\alpha \\ dw^g \\ dI \end{bmatrix} = - \begin{bmatrix} G_{\alpha R} \\ 0 \\ G_{IR} \end{bmatrix} dR \quad (\text{A7})$$

By Cramer's Rule:

$$\frac{d\alpha}{dR} = \frac{-G_{\alpha R} (G_{w^g w^g} G_{II} - G_{w^g I}^2) + G_{\alpha I} G_{IR} G_{w^g w^g}}{\Delta} \leq (>) 0 \quad (\text{A8})$$

where Δ is the determinants which by the second order conditions is negative. Note that as $f' \rightarrow 0$, then $G_{\alpha R} < 0$ and then $\frac{d\alpha}{dR} > 0$.

$$\frac{dw^g}{dR} = 0 \quad (\text{A9})$$

$$\frac{dI}{dR} = \frac{G_{w^s w^s} (G_{\alpha\alpha} G_{IR} + G_{\alpha I} G_{\alpha R})}{\Delta} \leq (>) 0 \quad (A10)$$

We now show that (A10) is negative when R is sufficiently large and when political accountability is sufficiently low.

By the second order conditions $|G_{\alpha\alpha}| > |G_{\alpha I}|$. It follows that $\frac{dI}{dR} < 0$ if $-G_{IR} > G_{\alpha R}$.

Upon substituting for these expressions:

$$-\left(-\frac{\partial \eta}{\partial I} f' + f''(1 - \eta(I) \frac{dW}{dI})\right) > \frac{dW}{dR} (f' - f''R) - \alpha f' \quad (A11)$$

When $f' \rightarrow 0$ this expression simplifies to:

$$-(1 - \eta(I) \frac{dW}{dI}) > -\alpha \frac{dW}{dR} f''R \quad (A12)$$

Define a function $Z(R)$:

$$Z(R) = \alpha \frac{dW}{dR} f''R - (1 - \eta(I) \frac{dW}{dI}) \quad (A13)$$

Note the following:

(i) $\frac{d^2W}{dI dR} = 0$, (ii) in equilibrium $\frac{dW}{dI} > 0$, (iii) as $R \rightarrow \infty$ then $Z(R) \rightarrow +\infty$ and (iv) as

$R \rightarrow 0$ then $Z(R) \rightarrow -(1 - \eta(I) \frac{dW}{dI}) < 0$. From the Intermediate Value Theorem it

follows that there exists a value R^* such that $Z(R^*) = 0$: And if $R > R^*$ then $Z(R) > 0$ and if $R < R^*$ then $Z(R) < 0$.

It follows that if $R > R^*$ and as $f' \rightarrow 0$, then, $\frac{dI}{dR} < 0$.

Consider next the impact on manufacturing sector output levels:

$\frac{dQ}{dR} = \frac{dI}{dR} \left(\frac{\partial Q}{\partial L^m} \frac{\partial L^m}{\partial I} + \frac{dM}{dI} \right) < 0$ whenever $R > R^*$ and as $f' \rightarrow 0$. The sign follows

from the assumption that $dM/dI > 0$.

A.2. Analysing the Resource Curse in the Indian context using Sachs and Warner's (1995) Methodology

In order to replicate the work of Sachs and Warner (1995) using OLS estimates, we consider two institutional variables that might impact the growth of a State. Our primary governance indicator continues to be – (1) ‘rule of law’ - We proxy this by considering the proportion of criminal cases pending in a court of law in each state. The assumption being, the more effective the legal system and government administration, the lower will be the proportion of cases pending.

(2) ‘Extent of Bureaucracy’ – In this we wish to study the ‘effective absorption’ by the citizens of a state of the public goods offered by the State. This is in a sense what Sachs and Warner (1995) refer to as the ‘quality of bureaucracy’. However, our measure is in the ‘more is bad’ category. The argument being, the higher the level of bureaucratic interference in a State, the more difficult it is for firms and people of the State to utilise the public goods provided by the State. We propose to proxy this by considering the share of administrative expenditures to the revenues of each State¹. The inference thus is that the resource curse might have an impact on growth, but there are other factors, which also determine the level of growth of a region.

We begin by replicating the Sachs and Warner (1995) methodology:

$$(1/T)\log(Y_{iT} / Y_{i0}) = \alpha_0 + \alpha_1 \log(Y_{i0}) + \alpha_2 Z_i + \varepsilon$$

where the left hand variable is the average rate of growth of state i between time 0 and T , Y_{i0} is the initial level of income and Z_i are the vectors of other characteristics that impact the rate of growth. To this regression we add the interaction between

¹ Interestingly the World Development Report 2004, further notes that in Kerala “education and health services accounted for a much higher share of public expenditures as compared to what was *spent on state administration*.” This further supports the approach adopted in the empirical section of this paper that higher expenditures on state administration translate into increased bureaucratic hurdles or red tapism. However, it must be remembered that it was not possible to use administrative expenditure in the ‘levels’ equation, since higher expenditures would be endogenous to GDP per capita.

resources in 1985 (initial level of resources) and electoral competition (SURMINESDP). The data are from 1985 to 2000.

The first column in Table T1 shows that the impact of high resources combined with a high probability of survival has a negative impact on the average rate of growth in Indian States (Table T1). However, to ensure that the relationship between resources and growth is not spurious, we add other factors, which affect economic growth. In the column 2, we add the dummy variable 'ports' to see whether geographic location has had an impact on the growth performance of Indian states. We note that the presence of ports is strongly conducive to growth, while resource continues to have a negative and significant impact on growth. In the next column (Col. 3) we include a proxy for labour, viz. the literacy rate in each state. The political-resource curse holds and both ports and literacy rates are positively related to growth. The next variable we add is the population density (Col. 4) and this has a negative impact on growth. In Column 5, we add the institutional variable 'percentage of cases pending in a state'. The coefficient of this variable is negative and strongly significant. Column 6, includes are second institutional variable of 'red-tape', which has a significant and negative impact on growth. The final column (Col. 7) includes the incidence of poverty, which is represented by the share of agriculture in state output. Poverty has a negative impact on growth. The signs and significance of the other coefficients are unchanged except for the bank credit per capita variable, which loses its significance. The other factor to be noted is that the sign of the initial level of income is not robust, indicating that we are unable to comment regarding convergence or divergence across Indian states. This appears to be in line with the varied results obtained in other studies (Bajpai and Sachs (1999), Rao, Shand and Kalirajan (1999), Aiyar (2001)).

Having established that the interaction between resources and political competition is a significant determinant of state growth, we now analyse the impact on institutions using OLS. (Table T2) confirm that resources and level of political competition have an impact on institutional quality across Indian states, when they are interacted. We also note that survival probability has an individual impact on institutional quality as well. The resource - political competition interaction variable has a positive and significant coefficient, indicating that a resource rich state with low political competition is more likely to have weak legal institutions. Similarly higher population density leads to poorer rate of case disposal and lower electoral competition (higher survival probability) increases the proportion of cases pending. The proxy for poverty (share of agriculture in SDP) has an insignificant impact on proportion of cases pending.

In the first equation, the institutional dependent variable is the 'extent of bureaucracy' variable, proxied by the level of administrative expenditure as a share of state revenues. The coefficient of the interaction term ($\log(\text{surminesdp})$) is not significant. Survival probability appears to increase 'red tape' possibly because of lower citizen welfare consideration by the political parties. The second equation has 'proportion of criminal cases pending with courts' ($\log(\text{crimedisp})$) as the dependent variable. Here our interaction variable has a positive and significant coefficient, indicating that a resource rich state with low political competition is more likely to have a higher number of cases pending or weak legal institutions. Similarly higher population density leads to poorer rate of case disposal and lower electoral competition (higher survival probability) increases the proportion of cases pending. The proxy for poverty (share of agriculture in SDP) has an insignificant impact on proportion of cases pending. Thus our findings are broadly consistent with the view

that endowments or resources influence the creation of better and more responsive institutions.

Table T1: OLS Estimation of association between growth (1985-2000) and resource intensity (1985)

Dependent Variable (SDPPCAVGROG)

Independent variables	Col. 1	Col.2	Col. 3	Col. 4	Col. 5	Col. 6	Col.7
Initial SDP per capita Log (initialsdppc)	1.24* (2.44)	-0.03 (-0.07)	-0.20 (-0.47)	-1.55** (3.65)	-0.40 (-0.89)	1.18** (3.08)	0.87* (2.31)
(Share of mines SDP in 1985) *(political survival) Log (surinitminesdp)	-0.31** (-3.89)	-0.48** (-7.17)	-0.44** (-6.24)	-0.71** (-9.98)	-0.45** (-5.44)	-0.19** (-2.77)	-0.26** (-3.88)
Presence of port (port)		1.67** (10.68)	1.49** (7.96)	1.71** (10.17)	1.60** (10.07)	1.57** (12.49)	1.25** (8.69)
Literacy Rates Log (literacy)			0.88 (1.66)	1.74** (3.61)	1.68** (3.70)	0.46 (1.25)	-0.30 (-0.73)
Population density Log (popnsqkm)				-1.23** (-7.85)	-0.85** (-5.17)	-0.59** (-4.53)	-0.50** (-3.88)
Percent of pending criminal cases Log (crimedisp)					-3.40** (-5.49)	-4.28** (-8.64)	-4.10** (-8.51)
Measure of 'red tape' Log (admnexp)						-3.34** (-11.4)	-3.13** (-10.92)
Share of agriculture in SDP Log (agrisdp)							-1.11** (-3.99)
No. of Observations	225	225	225	225	225	225	225
Adjusted R Square	0.22	0.48	0.49	0.60	0.64	0.78	0.79
F-Statistic	33.24	71.50	54.74	68.24	69.52	114.06	108.69

* significant at 5 per cent level

** significant at 1 per cent level

Figures in brackets are the T-ratios

Table T2: OLS estimation of the impact of resources on Institutions

	Administrative Expenditure in 1985 log(initialadmexp)	Proportion of Cases Pending Log(crimedisp)
Share of mines in SDP * survival probability Log(surminesdp)	0.02 (1.78)	0.03** (6.99)
Presence of Port (port)	-0.11* (-2.45)	-0.02 (-1.09)
Share of agriculture in state domestic product Log(agrisdp)	0.08 (1.15)	-0.07 (-1.79)
Population density Log(popntsqkm)	0.19** (5.39)	0.09** (5.04)
Survival probability Log(survivcomp)	0.33** (3.11)	0.14** (2.65)
No. of Observations	225	225
Adjusted R Square	0.18	0.18

* significant at 5 per cent level

** significant at 1 per cent level

Figures in brackets are the T-ratios

Appendix B: Appendix to Chapter 5

B.1. Solution to the Hard Budget Constraint (General Case)

Maximise

$$W_i^{HB} = x(K_i^F, I_i^{HB}) + \alpha B^H + u(z_i^{HB}) + h(K_i^R) - \tau^{HB}$$

$$\text{s.t. } \alpha R^H + \tau_i = I_i^{HB} + z_i^{HB}$$

where τ^{HB} is the tax level imposed on the local firms under a hard budget.

Taking the Langrangian,

$$L = x(K_i^F, I_i^{HB}) + y_i + u(z_i^{HB}) + h(K_i^R) - \tau + \lambda(\alpha R^H + \tau^{HB} - I_i^{HB} - z_i^{HB})$$

$$\partial L / \partial I_i^{HB} = \partial x(K_i^F, I_i^{HB}) / \partial I_i^{HB} - \lambda = 0 \quad (\text{A1})$$

$$\partial L / \partial z_i^{HB} = u'(z_i^{HB}) - \lambda = 0 \quad (\text{A2})$$

$$\partial L / \partial \tau^{HB} = -1 + \lambda = 0 \quad (\text{A3})$$

$$\partial L / \partial \lambda = \alpha R^H + \tau^{HB} - I_i^{HB} - z_i^{HB} = 0 \quad (\text{A4})$$

Thus

$$\partial x(K_i, I_i^{HB}) / \partial I_i^{HB} = u'(z_i^{HB}) \quad (\text{A5})$$

$$I_i^{HB} + z_i^{HB} = E^H \quad (\text{A6})$$

Where (I_i^{HB}, z_i^{HB}) is the solution to the hard budget allocation

B.2. Solution to the Soft Budget Constraint (General Case)

Maximise

$$W_i^{SB} = x(K_i^F, I_i^{SB}) + \alpha B^H + (1 - \alpha)B^S + u(z_i^{SB}) + h(K_i^R) - \tau^{SB}$$

$$\text{s.t. } \alpha R^H + \tau^{SB} - (1 - \alpha)(S_i - R^S) = I_i^{SB} + z_i^{SB}$$

where τ^{SB} is the tax level imposed on the local firms under a soft budget

Taking the Langrangian,

$$L = x(K_i^F, I_i^{SB}) + \alpha B^H + (1 - \alpha)B^S + u(z_i^{SB}) + h(K_i^R) - \tau^{SB}$$

$$\lambda(\alpha R^H + \tau_i - (1 - \alpha)(S_i - R^S) - I_i^{SB} - z_i^{SB})$$

$$\partial L / \partial I_i^{SB} = \partial x(K_i^F, I_i^{SB}) / \partial I_i^{SB} - \lambda = 0 \quad (\text{A7})$$

$$\partial L / \partial z = u'(z_i^{SB}) - \lambda = 0 \quad (\text{A8})$$

$$\partial L / \partial S = (1 - \alpha) \partial B^S / \partial S + \lambda(1 - \alpha)(1 - \partial R^S / \partial S) = 0 \quad (\text{A9})$$

$$\text{So } \lambda = (\partial B^S / \partial S) / (1 - \partial R^S / \partial S)$$

$$\partial L / \partial \tau^{SB} = -1 + \lambda = 0 \quad (\text{A10})$$

$$\partial L / \partial \lambda = \alpha R^H + \tau_i - (1 - \alpha)(S_i - R^S) - I_i^{SB} - z_i^{SB} \quad (\text{A11})$$

Thus

$$\partial x(K_i^F, I_i^{SB}) / \partial I_i^{SB} = u'(z_i^{SB}) = (\partial B^S / \partial S) / (1 - \partial R^S / \partial S) \quad (\text{A12})$$

B.3. Solution to the Soft Budget Constraint (Partial Fiscal Centralisation)

For ‘good’ region g

Maximise

$$W_g = x(K_g^F, I_g^{HB}) + \alpha B^H + u(z_g^{HB}) + h(K_g^R) - \tau^{SB}$$

$$\text{s.t. } \alpha R^H + \tau^{SB} = I_g^{HB} + z_g^{HB}$$

For ‘bad’ region b,

Maximise

$$W_b = x(K_b^F, I_b^{SB}) + \alpha B^H + (1 - \alpha) B^S + u(z_b^{SB}) + h(K_b^R) - \tau^{SB}$$

$$\text{s.t. } \alpha R^H + \tau^{SB} - (1 - \alpha)(S_b - R^S) = I_b^{SB} + z_b^{SB}$$

Here we assume the same level of local firms tax τ^S or both the regions.

Thus the problem becomes,

$$G^{CS} = \text{Max}(W_g + W_b) \text{s.t. } \alpha R^H + \alpha R^H - (1 - \alpha)(S - R^S) + 2\tau = I_g^{SB} + I_b^{SB} + z_g^{SB} + z_b^{SB}$$

$$(\text{A13})$$

$$\text{Therefore, } \tau^{SB} = (I_g^{HB} + I_b^{SB} + z_g^{HB} + z_b^{SB} + (1 - \alpha)S - 2\alpha R^H - (1 - \alpha)R^L) / 2$$

$$\partial G^{CS} / \partial I_g^{HB} = \partial x(K_g^F, I_g^{HB}) / \partial I_g^{HB} - 1/2 = 0 \quad (\text{A14})$$

$$\partial G^{CS} / \partial I_b^{SB} = \partial x(K_b^F, I_b^{SB}) / \partial I_b^{SB} - 1/2 = 0 \quad (\text{A15})$$

$$\partial G^{CS} / \partial z_g^{HB} = u'(z_g^{HB}) - 1/2 = 0 \quad (\text{A16})$$

$$\partial G^{CS} / \partial z_b^{SB} = u'(z_b^{SB}) - 1/2 = 0 \quad (\text{A17})$$

$$\partial G^{CS} / \partial S = (1 - \alpha) \partial B^S / \partial S + (1 - \alpha)(1/2 - (\partial R^S / \partial S) / 2) = 0 \quad (\text{A18})$$

So,

$$\partial x(K_g^F, I_g^{HB}) / \partial I_g^{HB} = \partial x(K_b^F, I_b^{SB}) / \partial I_b^{SB} = u'(z_g^{HB}) = u'(z_b^{SB}) = 1/2 \quad (A19)$$

B.4. Solution to the Hard Budget Constraint (Partial Fiscal Centralisation)

For region g

$$W_g = x(K_g^F, I_g^{HB}) + \alpha B^H + u(z_g^{HB}) + h(K_g^R) - \tau^{HB}$$

$$\text{s.t. } \alpha R^H + \tau^{HB} = I_g^{HB} + z_g^{HB}$$

For region j,

$$W_j = x(K_j^F, I_j^{HB}) + \alpha B^H + u(z_j^{HB}) + h(K_j^R) - \tau^{HB}$$

$$\text{s.t. } \alpha R^H + \tau^{HB} = I_j^{HB} + z_j^{HB}$$

τ^{HB} is the level of tax in both the regions

Thus the problem now becomes,

$$G^{CH} = \text{Max}(W_g + W_j) \text{ s.t. } \alpha R^H + 2\tau = I_g^{HB} + I_j^{HB} + z_g^{HB} + z_j^{HB} \text{ ----(A20)}$$

$$\text{Therefore, } \tau = (I_g^{HB} + I_j^{HB} + z_g^{HB} + z_j^{HB} - 2\alpha R^H) / 2$$

The first order conditions give us,

$$\partial G^{CH} / \partial I_g^{HB} = \partial x(K_g^F, I_g^{HB}) / \partial I_g^{HB} - 1/2 = 0 \quad (A21)$$

$$\partial G^{CH} / \partial I_j^{HB} = \partial x(K_j^F, I_j^{HB}) / \partial I_j^{HB} - 1/2 = 0 \quad (A22)$$

$$\partial G^{CH} / \partial z_g^{HB} = u'(z_g^{HB}) - 1/2 = 0 \quad (A23)$$

$$\partial G^{CH} / \partial z_j^{HB} = u'(z_j^{HB}) - 1/2 = 0 \quad (A24)$$

$$\partial G^{CH} / \partial S = 0 \quad (A25)$$

Thus,

$$\partial x(K_g^F, I_g^{HB}) / \partial I_g^{HB} = \partial x(K_b^F, I_b^{SB}) / \partial I_b^{SB} = u'(z_g^{HB}) = u'(z_b^{SB}) = 1/2 \quad (A26)$$

B.5. Welfare level comparisons under SBC and HBC in ‘good’ states of the world

Proof of Proposition 3b

If $z^{HB} > z^{SB}$

then by concavity, $u'(z_i^{HB}) < u'(z_i^{SB})$

The PSU employees put in effort e to produce z . Since $e^H > e^S$

Therefore, $z^{HB} > z^{SB}$ and by extension, $u(z^{HB}) > u(z^{SB})$

Now, for region g

$$W_g^{HB} = x(K_g^F, I_g^{HB}) + B^H + u(z_g^{HB}) + h(K_g^R) - \tau^{HB} \quad (A27)$$

$$\text{s.t } R^H + \tau^{HB} = I_g^{HB}$$

Note that the level of z is determined by the level of effort and is therefore no longer a choice variable in our problem.

Similarly, for region b

$$W_b^{SB} = x(K_b^F, I_b^{SB}) + \alpha B^H + (1-\alpha)B^L + u(z_b^{SB}) + h(K_b^R) - \tau^{SB} \quad (A28)$$

$$\alpha R^H + \tau^{SB} - (1-\alpha)(S - R^S) = I_b^{SB}$$

We know that $x^{HB}(\cdot) > x^{SB}(\cdot)$, $u(z^{HB}) > u(z^{SB})$ and $\tau^{SB} > \tau^{HB}$

But we need to prove

$$B^H - \tau^{HB} > \alpha B^H + (1-\alpha)B^S - \tau^{SB} \quad (A29)$$

as a sufficient condition for $W^{HB} > W^{SB}$

Proof:

Substituting, $\tau^{HB} = I_g^{HB} - R^H$ in equation 15a, (The ‘good’ region with the HBC)

$$W_g^{HB} = x(K_g^F, I_g^{HB}) + B^H + u(z_g^{HB}) + h(K_g^R) - I_g^{HB} + R^H$$

Differentiating with respect to I_g^{HB} and S

$$\partial W_g^{HB} / \partial I_g^{HB} = x'^{HB}(\cdot) - 1 = 0 \quad (A30)$$

$$\partial W_g^{HB} / \partial S = 0 \quad (A31)$$

Substituting, $\tau^{SB} = (1-\alpha)(S_b - R^S) + I_b^{SB} - \alpha R^H$ in equation (A28) (The ‘bad’ region with SBC)

For simplicity let us assume that $R^S = 0$

Therefore,

$$W_b^{SB} = x^{SB}(K_b^F, I_b^{SB}) + \alpha B^H + (1-\alpha)B^S + u(z_b^{SB}) + h(K_b^R) - (1-\alpha)S - I_b^{SB} + \alpha R^H$$

Differentiating with respect to I_b and S

$$\partial W_b^{SB} / \partial I_b = x'^{SB}(\cdot) - 1 = 0 \quad (A32)$$

$$\partial W_b^{HB} / \partial S = (1-\alpha)\partial B^S / \partial S + \frac{\partial u(z)}{\partial z} \frac{\partial z}{\partial e} \frac{\partial e}{\partial S} - (1-\alpha) = 0 \quad (\text{A33})$$

From (A29),

$$((1-\alpha)B^H - \tau^{HB} > (1-\alpha)B^S - \tau^{SB}$$

$$((1-\alpha)B^H - I_g^{HB} + R^H > (1-\alpha)B^S - I_b^{SB} - (1-\alpha)S$$

Comparing (A30) and (A32), $I_g^{HB} = I_b^{SB}$

From assumption, $S_i \geq R^S + B^S$

So LHS > RHS, Thus $W^{HB} > W^{SB}$ Q.E.D

B.6. Welfare level comparisons under SBC and HBC in 'bad' states of the world

Proof of Proposition 4b

We need to see if $W^{S^*} > W^{H^*}$

Proof (i):

We know,

$$W_i^{H^*} = x^{H^*}(K_i^F, I_i) + h(K_i^R) - \tau^{H^*} \text{ s.t } \tau_i^{H^*} = I_i^{H^*} \quad (\text{A34})$$

$$\begin{aligned} W_i^{S^*} &= x^{S^*}(K_i^F, I_i^{S^*}) + (1-\alpha)B^{L^*} + u^{S^*}(z_i) + h(K_i^R) - \tau_i^{S^*} \text{ s.t.} \\ \tau_i^{S^*} + (1-\alpha)(R^{L^*} - S_i) &= I_i^{S^*} \end{aligned} \quad (\text{A35})$$

$$\frac{\partial W_i^{H^*}}{\partial I_i^{H^*}} = x'^{H^*}(K_i^F, I_i^{H^*}) - 1 = 0 \quad (\text{A36})$$

$$\frac{\partial W_i^{S^*}}{\partial I_i^{S^*}} = x'^{S^*}(K_i^F, I_i^{S^*}) - 1 = 0 \quad (\text{A37})$$

This proves

$$x'^{S^*}(K_i^F, I_i^{S^*}) = x'^{H^*}(K_i^F, I_i^{H^*}) \text{ and by extension } I_i^{S^*} = I_i^{H^*}$$

But we need to prove

$$(1-\alpha)B^{L^*} - \tau^{S^*} > -\tau^{H^*} \text{ as a sufficient condition for } W^{S^*} > W^{H^*}$$

Proof (ii):

Substituting $\tau_i^{H^*} = I_i^{H^*}$ and $\tau_i^{S^*} + (1-\alpha)(R^{S^*} - S_i) = I_i^{S^*}$

We get,

$$(1-\alpha)B^{S^*} - I^{S^*} + (1-\alpha)(R^{S^*} - S) > -I^{H^*}$$

We know, $I^{S^*} = I^{H^*}$

And by assumption, $B^{S^*} > 0, R^{S^*} > S$

So LHS > RHS, Thus $W^{S^*} > W^{H^*}$ Q.E.D

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