POLITICAL ECONOMY OF INFRASTRUCTURE, DEVELOPMENT AND POVERTY IN A DEMOCRATIC SETTING

by

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To my Parents,

Maa, Draupadi and

Bapu, Kishanlalji.

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

This is a theoretical and empirical study relating infrastructure quality and its development to several socio-economic parameters such as the poverty ratio, relative deprivation, external funding and expenditure on infrastructure. Is the poor quality of infrastructure in developing countries an outcome of the scarcity of financial resources, of rent-seeking or of some other variables? How do the above socio-economic parameters affect it? What role do democratic institutions play in the relationship between infrastructure, poverty and stagnation?

A political economy model is constructed to help provide answers to these questions. In a developing country with a democratic setting we find that poverty, rent-seeking, information asymmetry and relative income deprivation contribute substantially to such understanding. India with a sufficiently mature and functioning democracy offers a good case for research.

We carry out an empirical application of the model making use of inter-state data from India. We find that socio-economic parameters, especially the poverty ratio and relative income levels have highly significant effects on the development of infrastructure. Democratic institutions play a very important role in restricting the rent-extraction opportunities. Given the institutional constraints on budgetary allocation, politicians do a good job using incomplete projects as a means of providing employment for the poor. We also find that the timing of elections has no significant impact on the amount so spent. But this is shown to come at a high cost in terms of long term economic growth. Hence, the empirical findings provide strong support for the model.

CHAPTER 1

INTRODUCTION

Quality infrastructure development is essential for economic growth. In the developing world, infrastructure development is far from being optimum. Why is the infrastructure qualitatively so poor? Is the poor quality of infrastructure an outcome of scarcity of financial resources, of corruption or of something else? How do socio-economic parameters effect the problem? Does democracy facilitate a break in or reinforce the vicious circle of poor infrastructure quality, poverty and stagnation? It is our conviction that these questions require designing a political economic model to help answer them.

To date most research in political economy has related to OECD countries. As such most of it aims at explaining election year or electoral cycle fluctuations in macro-economic variables, such as the political business cycle. Although literature on rent-seeking is abundant, the concept of rent seeking has rarely been used in the above context. The impact of democratic institutions has received attention, but very few studies have analyzed their impact on the development of physical infrastructure and even fewer on its qualitative dimension. Since poverty is not a major issue in developed countries, rarely has poverty

been integrated into such political economic modeling. Incorporating poverty and relative income, we find, enriches the theoretical construct and improves our ability to explain why infrastructure remains so poor, especially in the case of developing countries. In this research my attempt is for a political economy model involving poverty, infrastructure and development.

Understanding the institutional system within which the political forces function and shape economic outcome is a pre-requisite. Democratic devices and rules governing their operation are necessary to allow this. Basic ingredients in democratic systems must be available through which the common citizen can make an impact on decision-making. In the developed world, political institutions with established traditions provide such an avenue. Among democracies in developing nations very few have had a sufficiently lengthy experience with democracy to enable these countries to be the subject of research. With over 50 years of democracy India is distinctive in this respect and for this reason is the subject of this study. Being a country of sub-continental dimension, an inter-state study within India can be as revealing as to a study of many developing countries. Basic features of Indian political system have to be borne in mind when we resort to political economic modeling, along with historic events that shaped democracy in India. This is more important because the Indian democracy is relatively nascent, when compared to Indian civilization, which is one of the most ancient ones in the world.

CHAPTER 2

DEMOCRACY AND DEMOCRATIC INSTITUTIONS IN INDIA

2.1 Democracy: Its Meaning and Growth

The twenty first century dawned in the backdrop of two decades of celebration of democracy at a global level. During these decades democratic expansion gathered unprecedented momentum. Prior to 1980, distributive justice was a main topic of research and subject of numerous published articles. Democracy became an important matter of interest primarily only thereafter. Many dimensions of democracy are distinguished in this research, such as participatory democracy and deliberative democracy. Its qualitative content has been emphasized in terms of freedom, pluralism, justice and accountability, on the one hand, and the appropriate institutional structure and electoral practices on the other.

Broadly, liberal electoral democracy has been characterized by salient features like regular, free and fair elections with freedom of participation in elections for political offices along with freedom of expression, organization, protest and civil liberty to all citizens. Its other salient features are precedence accorded to rule of law, treating all citizens on equal footing, the independence and neutrality of the judiciary and such other institutions catering to horizontal accountability with the objective of keeping checks and balances on power abuse.

It must involve free mass media and other channels of communication along with regulatory control over the armed forces by the civilian, political bodies in term of civilian control over the defense services.

At the beginning of the present century every major region of the world has at least an imprint of democracy. In the judgment of Freedom House, more than 60% of all Nation States in the world are democratic. The spectacular growth of democracy can be seen in Table 1.

TABLE 2.1 **NUMBERS OF ELECTORAL DEMOCRACIES 1974, 1988-2003**

Year	No. of Democracies	No. of Countries	Democracies as a % of All Countries
1974	39	142	27.50
1988	66	167	39.50
1990	76	165	46.10
1991	91	183	49.70
1992	99	186	53.20
1993	108	190	56.80
1994	114	191	59.70
1995	117	191	61.30
1996	118	191	61.80
1997	117	191	61.30
1998	117	191	61.30
1999	120	192	62.50
2000	120	192	62.50
2001	120	192	62.50
2002	121	192	63.02
2003	121	192	63.02

Source: Freedom House (website: www.freedomhouse.org)

It would be relevant to note that in 25 years the number of democratic countries has more than tripled.

2.2 Democracy and Decentralization

With the cold war between the East and the West receding into background liberal democracy came to be accepted as the 'only' desirable form of government. Liberal democracy as a concept can be subdivided into three dimensions, namely, 'Economic' liberalism, 'Civil' liberalism, and 'Political' liberalism.

While the process of democratization is generally construed as referring to the political process, in fact democratization refers to improvement in all three dimensions. This implies simultaneous movement towards economic liberalization, civil liberties and citizen's rights and a legal-institutional framework for ensuring political competition.

The institutional design for any successful democracy must be contextually sensitive. In this respect, the institutional structure must incorporate the specifics of the existing institutional architecture, political culture, and the fundamental principles underlying societal identity and organization. The building blocks of the institutional design need to account for different components of the political system like government characteristics, the nature of the party system and the degree of administrative centralization. It is increasingly argued that democratic good governance is a necessary prerequisite for economic development, thereby calling attention to the importance of appropriate institutional set-up.

The basic philosophy of democracy was enriched by ideas of John Rawls and many other political philosophers. With this, the participation of different social groups is also valued.

The democratic paradigm emphasizes such devices and institutions that can incorporate previously marginalized groups into democratic deliberations. This manifested in the global trend toward decentralization along with that of democratization. Democratization thus implies the expansion of democracy to the grass roots level. Peoples' participation at different levels signifies operational democracy not only at the top, but also at the lowest and middle levels of the political system. It necessarily includes a constitutional framework for indicating how democratic power is to be shared between the different levels. Ensuring successful functioning at lower levels is the important concern. To this extent the objective of decentralization is to make the democracy function at the lowest level. This brings the masses into the political system and confers on them a role in the functioning of a representative government. This contributes to the political process in terms of new recruitment on one hand and rising competition and uncertainty in the electoral process on the other.

2.3 India ushering-in Democracy

India received its independence in 1947. This came at the heels of major crises in the world at large. The First World War was followed by growing misery and deprivation over the length and breadth of the globe culminating in the great depression. Then, on ideological front there were the trauma of Nazism and fascism, the Russian revolution and subsequently Stalin's colonization of East Europe. Against this backdrop India became independent. Jawaharlal Nehru, the first Prime Minister of India described the event as fulfillment of the

"Tryst with destiny". At the same time sheer inhumanity in terms of worst brutality and human killings based on religion marked the partition of India.

Indian independence was preceded by simultaneous strides of nationalism and national experiences in democracy. To that extent both nationalism and democracy are inseparable in the Indian context. Furthermore, the concepts of equality and social justice became associated from the very beginning of national struggle for independence. Hence political liberalism is also a salient feature of Indian democracy. Indian heritage consists of a rich cultural mosaic of different strands of religion, ethnicity, and social identities. Such diversified plurality enriched the democratic state of India with federalism and secularism.

It is with special reference to the rich socio-cultural diversity of India that 'New York Times' editorialized on October 8, 1999:

> As 360 million Indians voted over the last month, the worlds' largest and most fractious democracy once again set a stunning example for all nations....
>
> India's rich diversity sometimes looks like an obstacle to unity. But the latest election has proved that a commitment to resolving differences peacefully and democratically can transform diversity into a source of strength.

2.4 Institutional Setup

2.4.1 Indian Constitution: Basic Features

The following observations of Justice Joseph Story of the US Supreme Court about the US Constitution formed part of the inaugural address in the Constituent Assembly of India (which designed, formulated and authored the Constitution of India).

> The structure has been erected by architects of consummate skill and fidelity; its foundations are solid; its compartments are beautiful as well as useful, its arrangements are full of wisdom and order; and its defenses are impregnable from without.

The Indian Constitution came into effect on January 26, 1950. Amongst the salient features of the Indian Constitution, the following are especially important:

(1) It provides for a parliamentary system. The political executive is a part of the legislature, unlike the presidential system (as in USA) incorporating the principles of separation of power between executive, legislature and judiciary with stringent checks and balances. In India's parliamentary system, the very existence of the political executive is contingent on having a majority in legislature on day-to-day basis.

(2) The federal structure (although with a strong centre – it is called a 'Union' and not a 'Federation') provides for a delicate balance between forces of centralization and decentralization. It has attempted to reconcile the socio-cultural differences within

its national democratic aspirations. Thus in India, federalism provides crucial bonding between nationalism, democracy and socio-cultural plurality. While significant decentralization characterizes India's political system, its structure is founded in a centralized state. The Indian constitutional design of federalism has accommodated successfully the reconstructive needs arising out of decentralization demands. Thus it ensures India's systemic coherence.

(3) The Indian Parliament has been empowered to alter the territorial integrity of the states without their consent. This was utilized for linguistic reorganization of the States in 1956. Linguistic / cultural cohesion was the guiding principle for formation of the new states. The multi-cultural diversity within the unity of India was thus recognized by the political system immediately after independence. This has enabled the Indian State governments to include the rural people in the political process with use of local lingua franca. As a result, the resilience and legitimacy of the state remains enriched and enhanced.

(4) Regulatory institutions like judiciary, the presidency and the election commission have also been given adequate role. The Election Commission of India has acquired a national status as a prime force in conducting free and fair elections in India. The independence of the Election Commission has led to a greater popular belief in the same than either in the judiciary or the executive. Indeed the high level of public trust in the Election Commission of India clearly reveals the faith of the Indian electorate in free and fair elections. This is strikingly different than in other

developing (even in some developed) countries. Free and fair elections (a major constituent block of democracy) have added to the competitiveness and electoral uncertainty. Although India's constitutional design provided for a relatively centralized state with many powers vesting in the Union government, successful operation of its regulatory institutions have paved the way for an operational democracy in a real sense. This has augmented the institutional structure.

2.4.2 Constitutional / Legal Framework

2.4.2.1 Principles underlying the Constitution of India

Napoleon Bonaparte once told his political advisor Talleyrand that a "Constitution ought to be short and clear." To this, the advisor countered, "No Sire, it ought to be long and obscure."[1] Indian Constitution certainly qualifies on the first quality presupposed by the French political advisor. On inauguration, it contained 395 Articles and 8 Schedules, perhaps the lengthiest among democratic countries.

The basic spirit behind the Indian Constitution can best be summarized in the words of Mohandas K. Gandhi (popularly Mahatma Gandhi) (1931)

> I shall strive for a Constitution, that will release India from all thralldom and patronage and give her, if need be, the right to sin. I shall work for
>
> -an India, in which the poorest shall feel that it is their country, in whose making they have an effective voice;

[1] Pylee, MV (1967): p3-4.

-an India in which there shall be no high class and low class of people;

-an India in which all communities shall live in perfect harmony.[2]

The salient features of the Indian Constitution can be captured as under:

(1) Popular sovereignty, as enshrined through universal adult franchise, based on the democratic ideal of 'one man, one vote'. Its practice is safeguarded with free and fair elections conducted by an independent constitutional authority in the Election Commission of India.

(2) Liberal democratic rights as guaranteed by the provisions relating to 'Fundamental rights' and the 'Directive principles of State Policy' (DPSP) with the objectives laid down in the 'Preamble".

Granville Austin highlighted the social purpose behind India's Constitution as:

> The Indian Constitution is first and foremost a social document. The majority of its provisions are either directly aimed at furthering the goals of the social revolution, or attempt to foster this revolution by establishing the conditions necessary for its achievement...
>
> The core of the commitment to the social revolution lies in Part III (Fundamental rights) and Part IV (DPSP). These are the conscience of the Constitution.[3]

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[2] Pylee (1967): p50.

[3] Austin (1966): p50.

The Fundamental Rights provides each citizen with freedom from State coercion or restraints as well as from the privileged few or society as a whole. The DPSP

> aims at making the Indian masses free from passivity engendered by centuries of coercion by society and by nature, free from the abject physical conditions that had prevented them from fulfilling their best selves.[4]

The DPSP is a sort of charter outlining economic freedom for the poor and hence is just a guideline for state action. It echoes the socialist philosophy of the then framers of Indian Constitution. Whereas the DPSP is not enforceable in the Courts, the Fundamental rights can be.

(3) Judicial independence guarantees the democratic freedom. Although more limited in its scope than the US framework, India's judiciary has stood the test of time. It has upheld liberal rights for the citizenry.

(4) Federalism (of a typical variety with a strong center) adequately provides for the preservation of both the infinite socio-cultural diversity and the unity of the country. This is built upon the framework of parliamentary democracy with a cabinet form of government.

After 25 years of the Indian republic's functioning, in 1975 Mrs. Indira Gandhi, the then Prime Minister of India, reiterated:

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[4] Austin (1966): p51.

> The principal requirements of our nation are a centre with enough power to hold the country together and to carry through social transformation; component parts with enough freedom to retain their initiative and individuality; and citizens who are secure in their liberty and conscious of their rights and responsibilities...Right to freedom entails responsibility to defend it.[5]

Thus the Indian Constitution incorporates modern institutional structures with substantive departures to cater to the needs of national integration, security and social homogeneity. At the same time, linguistic and other cultural diversities are also taken cognizance of.

Granville Austin as under best encapsulates the fundamentals laid down by the Indian Constitution:

> With the adoption of the Constitution by the members of the Constituent Assembly on 26th November, 1949, India became the largest democracy in the world. By this act of strength and will, Assembly members began what was perhaps the greatest political venture since it originated in Philadelphia in 1787.[6]

Percival Spear opined,

> The Constitution must be on the whole pronounced a signal success.[7]

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[5] Shakdher (1976): p (ix)

[6] Austin (1966): p308.

[7] Spear (1961): p427.

2.4.2.2 Major Constitutional Amendments

The major amendments during the 1980s and thereafter mark further strengthening of India's democratic foundations and facilitating of mass participation in the institutional functioning. These are as under:

(1) Tenth (Xth) schedule incorporating "provisions as to disqualification on ground of defection" is another landmark constitutional provision. It was inserted effective from 1.3.1985. The act of defection signifies running after spoils of the political process, with shifting of one's political allegiance from one political party / group to another. It questions the credibility of political functionaries and vitiates the very fundamentals of the electoral process. It was a major first step towards cleansing the political system and public life in the democracy. The anti-defection law provides for a defector to lose the membership of the legislature. The only exception can be where one third of the elected representatives of any political party decide to break away from original party (ostensibly on ideological grounds). Although the switching of loyalties still remains, it became very sporadic after the enactment of these provisions. This has put a substantial check on the no-holds-barred rent seeking behavior of political office holders.

(2) The 73rd and 74th Constitutional Amendment Acts (effective from 24.4.1993) are remarkable in terms of institutionalizing decentralization of political power. The new system incorporates direct election to the sub-state levels by the people in the

> same manner as for the Union and State levels. Reservation of seats for women (not less than one third), a state level Election Commission to conduct elections in a free and fair manner and a Finance Commission to ensure financial viability of these sub-statal political institutions (Panchayati Raj Institutions - PRIs, as these are called in India) are the components with far reaching implications. The amendments have not only facilitated the operationalization of democracy but also helped in consolidating the constitutional coherence to rising aspirations of different segments of society.

The above amendments to the Constitution of India clearly demonstrate the maturing of democracy on Indian soil. With this, the acceptance of a modern liberal framework has also contributed considerably to rising electoral competition and uncertainty. Simultaneously it has provided an avenue for infusing new political recruits with increasing decentralization of the polity. As Austin pronounced:

> Equipped with the basic qualifications, attitudes (sense of their rich cultural heritage) and experience for creating and working a democratic constitution, Indians did not default their tryst with destiny.[8]

'The Economist' in its recent "A Survey of India" (Dated Feb 21-27, 2004) has commented:

> India's justified pride in its democratic credentials is an essential part of its international image. (p8)

[8] Austin (1966): p330.

2.5 Emerging Trends in Indian Democracy

2.5.1 Decentralization in democratic India

The institutionalized structure of the decentralization process in India consists of a 3-tier system at the sub-state level. Note that every State in India consists of at least a few districts as the sub-state administrative units. The sub-state levels are:

(a) Village Panchayat at the village level;

(b) Block / Panchayat Samiti at the intermediate level, i.e., between the village and district; and

(c) Zila Parishad / District Panchayat at the district level.

The above three-tier Panchayat system institutionalizes local self-government in the spirit of democratic decentralization. Democracy is extended to the grass-roots level through Panchayati Raj institutions. This has enabled local and regional groups to successfully press their demands and seek their fulfillment within the broad constitutional framework of a centralized state in India. As a result, the legitimacy of the Indian democracy has not only expanded but also deepened. With decentralization, new political manpower has been recruited and consequently new political resources have been infused into the Indian political system. This has resulted in a more inclusive democracy. Decentralization along with democratization has made Indian democracy more meaningful for the masses. Needless

to say, it has also weakened India's rigid social inequality at least to some extent. It thus results in both political liberalism and civil liberalism. Institutionalized political participation at the grass roots level fills the gap and consequently provides the crucial link between democracy and development. Essentially, this has resulted in greater responsiveness from the political executive.

2.5.2 Indian Democracy: Enduring and Bubbling

Amongst the developing nations in the post-colonial phase, India is the only country in which parliamentary government has continued for over 55 years after independence. In the Indian political system, different political parties (affirming divergent ideological stands) compete for the mass vote. Such free and fair competition for electoral support is rarely seen in developing nations. It has benefited the political system and its representative governments with legitimacy. To this extent that democracy has taken roots in India is without doubt. It is more obvious when we look at periodic elections continuing for more than 50 years, free and bubbling media, freedom of assembly and association allowing the electorate considerable avenues for expression of political dissent and protest.

In 1975, Prof. Robert L Hardgrave, Jr. has commented:

> Elections in India have generally been orderly. (P185)
>
> The whole procedure is scrutinized by polling agents representing each candidate. Their presence and assistance also serve to identify voters and prevent impersonations. (p186)

> As individuals become increasingly involved politically and as voting practice thus becomes institutionalized, payment (for vote-buying) declines in importance. (p199)[9]

In its country report on India, Freedom House has assessed the Indian elections as:

> Indian citizens can change their government through elections...Recent elections have generally been free and fair, although violence and irregularities marked balloting in several districts. (The website notes the deviations in Bihar, a few North Eastern states including Manipur.)[10]

2.5.3 Indian Political Parties: Post Independence Development

Political parties are fundamental constituent blocks of any democracy. The development of the political party system as a political institution has also led to strengthening of democracy in India. Three distinct phases best describe development in this respect as under:

(1) From Independence to 1960s

The Indian National Congress was the party, which spearheaded the struggle for independence. Although Congress included people with quite different ideologies, it continued to function as a single party until the late 1960s. Mr. Jawaharlal Nehru dominated the political activities and accepted the institutions and practices of democracy. Democracy at its nascence received a boost from the existence of well-

[9] Hardgrave, Jr. (1975)

[10] Country Report on India at the Website 'www.freedomhouse.org'

functioning civil service, delivery, effective governance and strengthening political stability and the political legitimacy of the Congress Party. But, although the Congress party derived its legitimacy from being the vehicle of Indian independence, political mobilization remained at a very low level. To this extent the political choices of the lower strata of the society were rather constrained in the process.

(2) 1970s and 1980s

This period is the most turbulent one in the development of the Indian political party system. Mrs. Indira Gandhi (daughter of Mr. Jawaharlal Nehru) dominated the political scene and restructured the Congress as a more populist and personalistic organ. Such a power design created a viable political centre around Mrs. Gandhi. It was only she who mattered in the Congress party. It led to the weakening of the institutions of political parties in the Indian political system. In her appeal to the poor of India, she fought 1971 elections on the plank of 'Remove Poverty', which caught the imagination of the downtrodden. Although she failed in delivery on such promises to the poor mass, Mrs. Gandhi politicized the existence of poverty amongst Indian populace. In the process Indian democracy grew in a different dimension, so as to include the lower strata in its core.

However, in such a rapidly politicizing society the absence of cohering institutions was the highlight of these two decades. There were discussions regarding the erring

judiciary and need for the bureaucracy to commit to tow the ideological lines of the Congress party under the leadership of Mrs. Gandhi. And one of the party Presidents during this period even went to the extent of equating India with Indira. When faced with judicial decree adverse to her own election to the Parliament of India, she resorted to emergency provisions ensuring her continuation as Prime Minister. Indian democracy faced its most dramatic and challenging experiences during these two decades. But Indian democracy confirmed its efficacy during this period by voting Mrs. Gandhi first out of, and then back in, to power after a few years.

(3) 1990s and till date

No single party has been able to win a majority in the Parliament since 1989. From then on there has been complete political resurgence in the institutionalized political system with the phasing out of the strong hold of the Nehru / Gandhi family. Whereas identity-based movements supported the growth of alternate parties at the national level, interest and issue-oriented movements remained often locally and regionally based. This led to the emergence of Bharatiya Janata Party (BJP, a Hindu dominated rightist party) at the national level and various regional parties in different states. This was the answer to the variety of national political experiments to find a substitute for the old Congress party. Over time BJP had to moderate its stand on ruling strategy. This helped it to broaden electoral support and seek active involvement of coalition allies in formation of the government. Logic of democratic institutions has wider acceptance than that of extremism or even religion-identity

based nationalism. This resulted in an institutional change, which is much more accommodating and much less conflict-generating. Consequently, the legitimacy of the Indian democracy has penetrated deep into the Indian social psyche.

'The Economist' in its recent "A Survey of India" (Dated Feb 21-27, 2004) has commented:

> Recent state election campaigns have been marked not by communal antagonism, but voters' mature disgruntlement over bad and corrupt government, pot-holed roads, poisonous water and meagre power supplies. (p3)...
>
> ..the BJP concentrated on the failings of the incumbent Congress governments. The results were hailed as a vindication of Indian political maturity. (p9)

2.5.4 Evolving Structure of Political Parties

Substantial change in the structure of political parties can be visualized from the fact that in the 40 years from 1950 to 1990 there were only eight general elections, whereas in the decade of 1990s five general elections were held. Regional nationalism (most often issue based) seems to find better support amongst masses than Hindu nationalism. The instability during the 1990s had the following underlying forces:

(a) Regional parties could prove to be focal points for local demands and issues. But at the same time they made for a collective action problem in forming a national government. This drives the locational context and consequential divergence in issues and problems with consequent no-appeal outside the originating area.

(b) The BJP could not have enough electoral support on the plank of Hindu nationalism to enable it to form a national government. Subsequently, it is only when BJP moderated its position that the regional allies joined it during late 1990s that it was able to form government at the national level.

The above clearly indicates the following institutional trends:

(1) Single party dominance appears to be outdated.

(2) Identity-based support structure is not strong enough to enable any party to capture power at the federal level. In the presence of complex socio-cultural diversities, the religious plank of Hinduism (that identifies India with traditional Hindu thought and culture) could not sway the vast electorate through the length and breadth of India. This implies the strong hold of democratic institutions in the political system. Economic issues also share of concerns that the political structure must grapple with.

Regarding the recent elections to four major state assemblies [in which The Bharatiya Janata Party (BJP), the predominantly Hindu nationalist party wrested three states from the Congress] John Elliott also wrote in the 'New Statesman' on 12.15.2003:

India's Bharatiya Janata Party (BJP) has just won elections in three important states and it has done so without playing its usual Hindu nationalist, or Hindutva, card.

Instead of relying on anti-Muslim sentiments, it defeated Congress, India's main opposition party –which is stuck in a time warp under its dynastic leader, Sonia Gandhi- with development-oriented slogans of bijli, sadak and pani. (Electricity, roads and water).

(3) The political scene is dotted with a party structure involving centralization (like BJP and Congress) but at the same time also decentralization (with region-specific, state-based political forces).

(4) These forces are leading to the development and emergence of a typical two-party system on the Indian political scene; simultaneous with the existence and strengthening of the regional parties. Each regional or state party has joined either of the major parties at the federal level. Today the National Democratic Alliance (NDA) headed by BJP had support of 302 members (total membership in Lok Sabha being 543). BJP on its own has strength of 182 but the 27 regional parties that have joined in coalition have given it another 120 members of parliament. Most of the regional parties (except for 3 major ones) have strength from 1 to 4 members only each. Similarly, the other alliance headed by Congress also has the support of several small regional parties.

As the research on democratic regimes and role of political parties therein has shown, the socio-cultural diversities clamor for separate political agents to represent each such diversified group, the trend will support for having multiple parties in such a case. At the same time, the logic of the majoritarian principle anchoring the electoral practice drives the institutional framework to have a two-party system. In

case of India, we have a unique combination in terms of the existence of regional and state parties at the state level that are regrouped into two broad alliances at the national level.

2.5.5 Competitiveness of Elections

Indian parliamentary democracy is based on the foundational combination of adult suffrage, secularism, and federalism. The democracy in India has not only taken root, but also these roots have been more widely and deeply spread. With the emergence of two party-led systems, the competitiveness of elections has also been established beyond doubt. Wherever there is a substantial presence of a local state party in a state the major opposition party in the state is either one of the two major parties or some other party. Basically, the electoral competition is evolving into a two-party structure, both at the state and federal levels. This is made possible with the character of inclusiveness of Indian democracy. The competitiveness of elections is also clear when we analyze the position that the aggregate voting level of both the Congress and BJP is in close proximity of 25% each. Of the remaining 50% about 17% has gone to other national parties and the balance has gone to the state and regional parties. Thus, although the constitutional framework is one of a centralized state, in practice, the moderate accommodation of demands from different interest groups (essentially those based on ethnicity) and some decentralization of power have not only ensured the competitiveness of the Indian elections but also strengthened India's democracy.

2.6 Emerging Trend - A Regulatory State

Immediately after independence M.K. Gandhi, Vallabh Bhai Patel and Subhash Chandra Bose left the scene perhaps prematurely. As a result, Jawaharlal Nehru and his supporters in the party had the complete freedom to design a state framework facilitating the functioning of a dominant party system and a planned economy with the support of the civil service. With the failure of socialism over large part of the globe, the role of the state has come to be recognized as primarily that of a regulatory one. Such a regulatory character is also better suited to coalition governments in a multi-party system. In particular, an all-encompassing administrative and political set up provides little scope for negotiation, which is precisely what a coalition government needs. As noted above, the governmental structure is basically evolving into a two-party framework.

With strength of regional parties, the states as federating units also came to be more independent and competitive with one another within a competitive economic structure. Expansion of info-media fuelled the expectations of the people throughout India. This has ensured a greater uncertainty about the electoral outcome. Regulatory institutions like the Judiciary and the Election Commission have become more assertive as the power of the political executive and the legislative bodies have receded. The political space vacated by these two major institutions, i.e., the political executive and legislature, has created a vacuum and an opportunity for the regulatory institutions emphasizing their constitutional roles as the regulatory mechanisms of the democratic polity. With an increase in the uncertainty about the performance at the hustings, the decision-making behavior of the

political executive has also undergone far-reaching changes in the face of increasing uncertainty. With a vast mass of the people living in or near abject poverty, incumbent political leaders cannot afford to neglect the needs of poor masses. Hence the need to satisfy the basic needs of the poor constrains decision-making, in so far as development projects are concerned. We further elaborate on this later on.

2.7 Electoral Participation

Participation of the electorate in the voting process has risen close to 60% average after 1965. Unlike in the developed world, it is the members of marginalized group that cast votes in large numbers. Power in the Indian political system is a direct outcome of the coalition formation at lower levels. This has been substantiated with the growth of regional / state parties. With this everyone in this game has a vested interest in maintaining democratic operations. Thus elections have acquired greater legitimacy as a major instrument with political functionaries and for political changes. Political parties consolidate their own support base in terms of different social groups by ensuing their mobilization and participation during elections. This has given rise to the awareness amongst the citizens about the efficacy of the electoral process. Key features like democracy, federalism, secularism and decentralization although long in existence have undergone large changes over time. This achievement of democracy can no longer be taken granted by any political institution. Hence, the growing sanctity of the democratic elections and greater uncertainty associated with it.

2.8 Emerging Trend in Economic Policy-making

Along with these subtle changes in India's democratic / political structure, the economic system has also undergone changes in terms of policy makers' behavior. The development of capitalism in India, however, has remained weak. No individual entity / group had enough strength of its own to influence the state decision- making conclusively. But, at the same time, the diverse interest groups induced the state to take decision enabling them to share the spoils of the system. Needless to say, aggregate welfare has been the victim. A large chunk of the state's financial resources is used up in subsidizing ever-increasing non-development expenditure. With staggering burden of public debt fiscal crises continue. Tension prevails between the demands of better-off states for a competitive framework vis-à-vis the economically weaker states (with substantive political strength like Bihar, U.P. etc.). This political logjam makes the state and analyses of the inter-state infrastructure development quite interesting.

2.9 Implications for Present Research

The above analysis brings out the following conclusions, especially relevant for the proposed research:

(1) The constitutional framework has established a trend supporting decentralization of the polity. This resulted in federating units recognizing the demands of the citizens.

(2) With increasing political awareness, the maturing democracy has escalated uncertainty with respect to election outcomes. This also entailed that the regulatory institutions like the Election Commission of India and the judiciary could assert their dual role, as envisaged under the Constitution.

(3) The political party system is slowly emerging into a two-party coalition-based framework. This further influences the decision-making behavior of the incumbent political executive. The increasing competitiveness of elections has further accentuated this dimension.

(4) With greater and wider political participation (especially by the lower strata of the society) the development path adopted must take care of the needs of the vast populace, most of whom live below the poverty line.

CHAPTER 3

EXISTING LITERATURE: A BRIEF SURVEY

3.1 Introduction

Political economy is the broad discipline at the interface between economics and politics. Its subject matter is that of political science like theory of the state, voting rules, party politics etc. but its methodology is that of economics in viewing the citizen / voter as a rational, utility maximizer.

3.2 Democracy and State

3.2.1 Democracy. Allocative Efficiency and Redistribution in,

Democracy is the institutional set up that channels the collective choice through the mechanism of formal voting. And the state, political parties and electoral rules are the mechanisms through which democracy is operationalized and collective choices are enforced. The state can be visualized as having two basic objectives; Allocative efficiency and redistribution. Allocative efficiency satisfies the collective needs of all members of the community and helps to achieve Pareto-optimality. Whereas redistribution addresses the

wants of a particular cluster / sub-set of it, it can also be viewed as a move towards Pareto optimality. To illustrate, when the State taxes the rich and spends the revenue for education for the poor, it in turn provides the human capital, which can augment the gross domestic product of the community. If so, this makes all members of the society better off and hence is a move towards Pareto improvement.

3.2.2 State in Democracy

The State was envisaged as a basic means of resolving externality issues. However, the Coase theorem as under (Ronald Coase, 1960) denied the necessity of this.

> In the absence of transaction and bargaining costs, affected parties to an externality will agree on an allocation of resources that is both Pareto optimal and independent of any prior assignment of property rights.[11]

The above theorem was thus demonstrated for only two parties. But, subsequently there were claims and counter claims regarding the validity of the Coase theorem when many parties are involved.

Bernholz (1997) proved that with property rights well defined and no transaction costs, the Pareto frontier can be reached only in the presence of binding internal and external contracts. To the extent that the State defines initial property rights and enforces contracts, the role of the State can be sufficiently supportive. Thus, in theory, the need for a State has been

[11] Mueller (2003): p28.

established beyond doubt so as to ensure Pareto optimality through the enforcement of collective choices on all individuals. The legitimacy of the state action can be ensured through and by the democratic institutions.

3.3 Voting in Democracy

Voting continues to be the basic mechanism through which democracy is operationalized. The instrument of voting must follow either the unanimity rule or the majority rule. Since unanimity is impossible in a large polity, the simple majority is generally followed as the optimal majority rule. Simple majority is the smallest majority by which one can;

(a) definitely select an option, and simultaneously

(b) deny the possibility that a conflicting position might obtain winning position.

Viewed from this angle the simple majority rule is optimal. It best operates when the issues are unidimensional. Poole and Rosenthal (1985, 1991) have analyzed the issues voted in the US Senate and the House during two centuries (1785 to 1985). They find that 81% of the senate and 83% of the house votes are on one dimension only. This establishes quite clearly the utility of the simple majority rule.

The Condorcet Jury Theorem of 1785 first established the usefulness of the majority rule. Mathematically, Condorcet's seminal contribution was based on certain strong assumptions.

Subsequently May (1952) provided theoretical support for majority rule with four basic conditions of decisiveness, ambiguity, neutrality and positive responsiveness. The results were further confirmed by Rae (1969) and Taylor (1969) (the Rae Taylor majority rule). Thus, the normative foundations for majoritarian democracy have been laid.

3.4 Representative Democracy: Its Dimensions

In a large polity representative democracy is the only possible avenue for the expression of collective preferences of citizens. In this regard, the existing literature in political economy can be broadly categorized as pertaining to three basic areas of research like voters' behavior in selection of representatives, the behavior of citizens' representatives before the elections during campaign and while in office; and policy outcome and its salient features under representative democracy.

3.4.1 The Selection of Representatives by the Citizens

3.4.1.1 Median Voter Theorem

Arrow (1951) in his famous contribution known as the "Impossibility Theorem" concluded that the solution to the problem of adding individual preferences for arriving at a common policy objective is impossible. In 1957 Anthony Downs made a seminal contribution, which is celebrated as "Downs Median Voter Theorem". Down's model follows from the fundamental premise;

> Parties form policies in order to win elections, rather than win elections in order to formulate policies[12]

With the above basic assumption and single-peaked preferences of the voters, Downs theorem forecasts that in a democracy different political parties would converge to more or less a common agenda, that would be close to the median voter position based on the necessity to win elections. This also lays the foundation for the opportunistic theory. Downs theorem basically follows the remarkable results shown earlier by Hotelling (1929). With political leaders / representatives engaged in two party competitions, the apparent stability of electoral parties follows from that the candidates' positions are not scattered over the entire spectrum of policy space but in fact tend to be concentrated at the middle.

Stokes (1963) positioned the addition of valence issues in such policy space. Valence issues are defined, as ones for which there is a common agreement amongst the voters that the voters are better with more than with less. Localization of policy platforms in policy space along with existence of valence issues increases likelihood of arriving at equilibrium. In a Hotelling-Downs platform, the winning combination will lie in close proximity to the center of the voters' ideal point, i.e., near the median voter position.

Arrow's impossibility theorem and the Downs median voter theorem needed practical testing. Whereas the findings of Kollman, Miller and Page (1992) were in conformity with the Downs position, Wittman (1973, 1977) and Poole and Rosenthal (1997) found the

[12] Downs (1957): p28.

importance of ideological dimension, i.e., favoring partisan political cycle models. Both Gramlich and Rubinfeld (1982) and Turnbull and Mitias (1999) have found the existence of a sufficient amount of white noise with the introduction of representatives in the democratic process between median voter preferences and final outcome. Thus, even though most of the empirical findings pertain largely to USA (sometimes including a few developed / OECD countries), the findings were not conclusive. This brings out clearly that modeling the government in the political economy is in a nascent and still evolving phase.

3.4.1.2 Probabilistic Voting Model

With multi-dimensional issues, the median voter principle does not work well. Put simply, when no policy dominates another completely, a candidate seeking election can always locate herself by a different policy (that may be preferred by more than 50% of voters) than her opponent. It results in the discontinuous location of different candidates in policy space. In the presence of such multi-dimensionality of policy space, probabilistic voting models offer unique equilibrium.

In probabilistic voting models, voters vary in their characteristics. Some voters are attached importance due their capability of swinging with reference to policy offerings. Such swing voters are highly responsive to policy favors. Probabilistic voting models introduce uncertainty and thereby provide smooth mapping from discontinuous policy space to aggregate voting outcome. These models build upon the assumption of continuous

probability functions with regard to utility functions. This differentiates it crucially from the median voter models.

Electoral competition rewards the responsive voters under the probabilistic voting assumption. Thus these models provide a very useful tool to probe positive and normative questions about voting theory and its applications. It enables us to differentiate between political competitors (unlike the median voter principle where only policies differ), in terms of their competence, ideological antecedents and other factors as well. These are, therefore, more close to reality.

Coughlin (1982, 1992) established that, as long as an individual voter's utility is directly related to the probability of winning, her vote in support of a particular candidate's platform, there would be equilibrium within a Pareto frontier with the standard properties. Thus, probabilistic voting models-related literature made rich contribution to the analysis of voting pattern and electoral competition. Such competition may even discipline rent seeking to a large extent.

3.5 Rent Seeking

Rents can be broadly defined as the benefits of all kinds accruing to office-holders. These can be monetary (private appropriation of societal output) as well as non-monetary (social standing, prestige associated with holding of office). In a wider sense, a monopoly can

extract rent by charging a price for its product, higher than optimum. Rent can be endogenous or exogenous and its extraction can take different forms. The most obvious is 'theft', with appropriation of social resources for private consumption. Here the political leader appropriates the fiscal residuum. The other is 'usufruct', that is enjoying goods and services (perks of office-holding) in excess of the next best opportunity. This benefit flows from use of public property. Such usufruct quantum varies directly with the size of the public sector and degree of centralization in the decision-making.

Rents benefit the rent-seeker (or rent-extractor) at the cost of citizenry. Government activities that provide scope for rent seeking have distortionary effects and corollary distributional consequences. These effects have further enriched rent-seeking applications in models dealing with government. Rent can also be considered to be a source of bargaining between the political executive and legislators over the locus of decision-making. It can also originate from asymmetric structure of information availability, with voters on one side and the politician (especially the incumbent) on the other.

In the median voter model, the candidates cannot be differentiated except on the policy platform. Simultaneous convergence to the median voter position implies that endogenous (that is monetary) rents are competed away. The competition then closes on to the exogenous rent of holding office. Here the competition is between office-seeking politicians instead of the rent-seeking ones. The voters not exhibiting any liking for any particular competitor, the prize of holding office consequent to winning of elections ensures honesty from politicians.

In the case of probabilistic voting models, the competitors are differentiable and no longer perfect substitutes to each other, implying that policy platforms are not decisive for electoral outcome. Thus with intrinsic differences prevailing and economic policy being no more the only determinant of elections, rents remain in equilibrium. Such equilibrium rents can be associated with inefficiency in production of public goods, level of competence of the political executive, asymmetric information, ideological dispersion and many other factors. Although equilibrium public goods are optimally provided for, positive equilibrium rents are one of the salient features. The basic thrust is the presence of a differentiating criterion other than (also aside with) policy. Even in such models, the swing voters are the old downsian electorate, who view the competitors as perfect substitutes.

Enforceability, verifiability and observability add other dimensions to the process. If commitments from political candidates cannot be enforced, or are neither verifiable nor observable, it results into an incomplete contract between the vote-seeker and the voter. With such incomplete contracts, delegation (after election) of decision-making amounts to relinquishing real power. The elected political leader can then exploit this and extract equilibrium rent, wherever circumstances so facilitate. Such a design refers to inefficient electoral competition. In the alternate, an efficient electoral competition must incorporate the absence of such differentiating criterion. Reputational concern can also be used as the correcting mechanism. But while taking care of certain fragilities, such a reputational concern-based mechanism design has other deficiencies, especially when voters have conflicting policy preferences; Persson and Tabellini (2000) constructed such a model with both endogenous and exogenous rents. The model results in Bertrand competition only for

the exogenous rent. Because the endogenous rent is reduced to zero. Bertrand competition uses price adjustments for arriving at equilibrium. Consequently the price, that is the endogenous rent in this case goes to zero.

3.6 Multiparty System

Representative democracy and voting by the citizens presuppose frequent seeking of re-election by the sovereign. The political process is a reflection of the society it represents. With socio-cultural and ethnic diversities in the society, different identity groups seek their representation. The result is a fillip to emergence of a large number of small political parties. With existence of many political parties, when each represents a distinct socio-cultural group, every participating political party wins to some extent. This is evident when most such parties win at least a few seats. This confers on every political party an adequate longevity enabling their participation in subsequent elections. Because the distinct group identity sustains such a party. To cater to the credentials for championing particular group-interest, a party occupies a particular place in the ideological space and tends to be there. In a multi-candidate setting, the median voter's position may also not be pivotal. The situation becomes more complex with first-past-the-post system.

And whenever no single party is able to get a simple majority, such parties with fewer seats occupy the unique bargaining position for negotiating their place in the government. Baron and Ferejohn (1989) have found legislative bargaining in such an eventuality. The policy

space here is dispersed and spread out. Often such smaller political parties compromise their partisan stand with respect to political preferences / ideological stand-point in order to increase their influence in policy making.

Axelrod (1970) has established the "Minimal-Connected-Winning (MCW) Hypothesis". It postulates that parties, which agree to constitute a winning coalition, should be adjacent to one another in a single policy dimension. In such a situation the central party occupies a position similar to the median one (Laver and Schofield, 1990). This is not to rule out the possibility that such connectedness may vary when there is a shift from single-dimensional to multi-dimensional issue space. Such variations largely explain the turbulence of coalition politics.

The above findings support Duverger's Law (Maurice Duverger, 1954) that under the plurality rule there is a clear tendency to proximate a two party system. This is based on the principle of voters' rationality wherein the voters desert the minor parties in favor of two leading parties.

3.7 Multi-party Fundamentals and Two-party Trend

A multi-party political structure is the tendency that emerges from a multi-ethnic, multi-lingual society with socio-cultural plurality. Since the multiparty system is a reflection of prevailing diversities and the need of their political representation. Consequently, large

numbers of parties are able to establish roots. This tendency toward a multiparty structure gets nurtured in the political process and acquires strength of its own on the conditionality of multi-candidate electoral constituencies (Duverger Hypothesis). Duverger's Hypothesis postulates that more than two parties will compete for votes in a situation where more than one representative is to be elected from one electoral district. A two party system is hypothesized as the outcome in a framework with purely majoritarian voting rules. Cox (1997) has also established this result.

The above theoretical framework and research thereon imply that wherever there is a first-past-the-post system, the electoral practice in single candidate electoral districts would converge to a two party system. And as we have observed earlier, large numbers of parties are likely to exist in the presence of large number of ethnic and social groups. The ethnic, religious and ideological heterogeneity of a state is reflected by multi-dimensionality of the issue space, giving rise to existence and sustenance of many parties. However, the above complexity would be superimposed by a trend toward emergence of a two party system, arising out of a majoritarian electoral system. Consequently, it is the minimum-connected-winning-hypothesis that provides the link between the socio-cultural diversity and the emergence of two party systems in democratic developing nations like India.

And in a two party system inherent stability would be there with a majority government. Simultaneously, change in government following the elections is also more likely in a two party system than in a multi party one. The duration of the cycle of change would depend on the political culture, the socio-economic performance and the expectations of citizens while

incorporating the voters' appreciation of past performance of both the groups. This theoretical postulate is supported by the realities of developing countries like India.

With a trend towards a two-party structure, the multiple parties would also synchronize their ideological stands in the policy space around two pivotal points that the leading parties may take. Of the two variants, the winning proposal would be closer to the median one and obviously it would be closer to some central area of the issue space. Schofield (1993, 1996) has conceptualized a region on the uncovered set, as the 'Political Heart'. The political heart would lie certainly within (or coincident with) the Pareto set, the area founded by the ideal points of all parties. However, for this phenomenon to be observed, free and fair elections and other pre-requisites of democracy must be there.

In a multiparty system, the central / core party holds the key position. In policy space, its position is in similarity with the median voter. With a majoritarian electoral system the diverse groups may be denied proper voice in the political process in the absence of an electoral system based on the principles of proportional representation. This is the cost that political stability needs to be augmented with. However, for ensuring political coherence it is a must that such group identities (who are in a minority) are not alienated completely. For that would render the political process incomplete, away from the basic tenets of democracy.

Coalitional politics has a strong debilitating effect on cabinet stability. Electoral uncertainty further accentuates incentive constraints on economic policy. The political executive manning the government may also be unstable. Consequently, one may find constantly

changing policies as the literature on cycling hypothesizes. Wherever the government finds it difficult to effect changes in the face of trends towards globalization and liberalization, one comes across divergence in what the government does and what it pronounces periodically under the compulsion of coalition politics. (Jenkins, 1999).

3.8 Electoral Competitiveness and Number of Parties

The success of democracy relies heavily upon the electoral competitiveness of political parties / representatives. The number of political parties is very crucial in this context. This is also indicative of competitive character of the electoral process. However, in a diversified and complex society, the number of existing political parties per se would be a misnomer. To illustrate, suppose we have the following two situations:

a) where each of ten political parties existing gets 10% of votes cast / seats; and
b) where the existing ten parties get 67%, 19%, 9%, 1% (2 parties each) and 0.6% (5 parties each) of votes / seats.

In case (a), obviously all ten parties are effective. But in case (b), only three parties are effective. Furthermore, the number of effective parties needs also to be necessarily linked to number of seats and/or to number of votes. (Especially where electoral process is based on the principles of proportional representation).

Taagepera and Shugart (1989) developed methods for calculating statistics for the effective number of parties, based on number of votes and number of seats respectively as under.

Effective Number of Parties based on number of Votes (ENV) = $1/\sum_{p=1}^{n}(v_p/v)^2$

Where v_p is the number of votes that party 'p' received in the election with 'v' being total number of votes cast and 'n' is the number of political parties.

Effective Number of Parties based on number of Seats (ENS) = $1/\sum_{p=1}^{n}(s_p/s)^2$

Where s_p is the number of seats that party 'p' received in the election with 's' being total number of seats available in the election and 'n' is the number of political parties.

In a majoritarian electoral system, generally ENV < ENS, because in a multi-party system number of seats are disproportionately higher to number of votes for the winning political party. And obviously, a political party's existence depends a lot on its presence in the legislature at least. Hence, in an electoral system based on proportional representation system we have ENS ≥ ENV, but in a first-past-the-post system we have invariably ENS >> ENV always for the winner. And ENS is a better indicator of effectiveness of the party and its competitiveness in such systems. Furthermore, with prevalence of coalition politics, it is essential that the coalition partners be joined together while arriving at this statistic. Alternatively, a minimum of 10% of seats / votes can also be adopted as a qualifying

criterion to judge the competitiveness of the electoral process. Then only a political party may be included in ENS / ENV. This is significant when we have a multitude of political parties vying for a status in a diversified socio-cultural setup. In addition, free and fair elections and use of violence for intimidating the voting process can also be taken as good indicators.

3.9 Voting

3.9.1 Voting by the Rational Voter

Most voting models presume voters to be rational. The rational voter hypothesis was further analyzed in detail by Tullock (1967) and Riker and Ordeshook (1968, 1973) after Downs. This gave rise to what is called, 'paradox of voting' which explains why no rational utility maximizer citizen should ever vote. For, it is better for him to allow his preferred candidate to lose because it is unlikely that one vote may decide the election outcome. The act of voting also carries with it the risk of accident in the process of doing so (however small though probability might be). In such a scenario the potential cost would far exceed the potential gain from the act of voting. Still millions of people do vote. This gives rise to the paradox. The paradox was explained by Ferejohn and Fiorina (1974) through the mechanism of considering the rational voter as a minimax-regret-strategist. The rational voter minimizes the possibility of regret which may arise in the event that her vote may be decisive (of course with a very tiny probability). Voter would have to regret when she abstains and later on finds

that her forgone vote would have been the decisive one. The "Minimax-Regret-Strategy" thus rationalizes voting by the voters.

The empirical evidence in support of the rational voter hypothesis is also given by Matsusaka and Palda (1993) Greene and Nikolaev (1999); and Thurner and Eymann (2000). It had also been found that voter participation directly increases with years of education, income and number of parties in the developed countries. In a multi-party system, as we analyzed earlier, all the parties win to some extent. This has a reinforcing effect on the voting of all voters. As a result, voting percentage goes up in a multi-party system compared to a two party system.

Fiorina (1976) formulated 'Expressive Voter Hypothesis'. It is hypothesized that a citizen votes to express an opinion on the possible outcome. And therefore, she thinks that her voting is important. The expressive voter hypothesis is also borne out by different surveys. To sum up, the voter intends to achieve the possibility of highest benefits by voting.

3.9.2 Retrospective Voting

Political scientist, V.O. Key Jr. (1966), formulated the "Retrospective Voters Hypothesis" according to which,

> The patterns of flow of the major streams of shifting voters graphically reflect the electorate in its great, and perhaps principal, role as an appraiser of past events, past performance, and past actions. It judges retrospectively; it commands prospectively

> only in so far as it expresses either approval or disapproval of that which has happened before.[13]

In a space spectrum delineating different hypotheses on voters' voting behavior, the rational voter hypothesis and the retrospective voter hypothesis are very close to each other. According to the rational voter hypothesis, the voter is rational and optimizes her utility by voting for a party which (when being in power) would be most beneficial to her utility. The retrospective voter principle stipulates that in retrospective-analysis based voting; the voter takes into account past events and actions of political parties and simultaneously emphasizes the prospective gains from a particular choice (sort of rational expectations).

3.10 Macro-economic Models of Political Economy

Politico-macroeconomic models provide an economic platform for analyzing macroeconomic performance and its impact on political competition. Amongst the different sub-topics in political economy, it is these politico-macroeconomic models that have been most researched, emphasized and empirically tested.

[13] Key, Jr. (1966): p61.

3.10.1 Political Parties: Partisan and Opportunistic

Political parties have usually been categorized broadly on the basis of the ideological orientation and as being either partisan or opportunistic. A political party is partisan when it has an ideological orientation and its ideology influences its policy choice. A political party is opportunistic when according to the Downs Median Voter premises "it is winning elections that count most". Evidence suggesting that politicians manipulate macroeconomic output with the objective of retaining power is widespread. Tufte (1978), Blais and Nadeau (1992), Alesina, Roubini and Cohen (1997), Schuknecht (2000) are amongst the major studies providing some evidence. Partisan biases have been supported by the findings of Tufte (1978), Hibbs (1994), Alesina, Roubini and Cohen (1997). But, on the other hand, Blais, Blake and Dion (1993) have concluded that there is little empirical evidence supporting partisan effect in cross-country data-analysis.

The opportunistic orientation of the political parties has been found by Nordhaus (1975), Cukierman and Meltzer (1986), Rogoff and Sibert (1988), Rogoff (1990), and Persson and Tabellini (1990). Most of these findings pertain to the US economy, but there are also some that pertain to other OECD countries.

In a Downsian model, with policy convergence between the parties the ideological differentiation tends to disappear. Therefore, to explain policy divergence, one has to introduce some other dimension wherein the candidates are imperfect substitutes for one another. Such a phenomenon can even easily be incorporated in post-election politics in

which new fragility may derive from the non-feasibility of enforcing binding commitments on the political leaders.

3.10.2 Voters: Myopic and Rational

Voters can be either myopic or rational. Myopic voters have a preference for low unemployment, high income and low inflation in the short run irrespective of subsequent consequences. But, the rational voter is more sophisticated making use of rational expectations (RE) hypothesis and tools of analysis and is primarily forward-looking. A seminal contribution by Kydland and Prescott (1977) reconciles the inflationary bias even without voter myopia. It describes the bias arising out of time in-consistency problems. This was preceded by Lucas's more fundamental contribution giving rise to rational expectations as the basis of analyses during 1970s. With rational expectations, the political business cycle must theoretically disappear. This was named "Determinacy Paradox" by O'Flaherty and Bhagwati (1997), which state that if the voter were fully rational, no advice would work.

Opportunistic models suggest that the voter's choice is completely fluid, determined by her position in the choice space. At the same time, liking for particular parties and their ideological orientation is always possible, at least to a limited extent.

Similarly, the opportunistic character of the political party can be justified by virtue of the fact that a political party would never be able to pursue any of its objectives, unless it would first win elections. However, once the elections have been won, a political party may decide

to be closer to its ideological preferences in the policy space. Such a partisan functioning would depend on the margin of electoral victory over its opponent, the overall number of seats that it has in the legislature and the duration of time before the next elections.

3.10.3 Differentiating amongst Political Parties

Rogoff and Sibert (1988) differentiated amongst the political parties in terms of competence giving rise to different output quantum. Moreover, the rational voter differentiates among the political competitors on the basis of their competence differential. Similarly, the rational voter can demonstrate his (her) party preference based on the quantum of rents taken by each political party.

3.11 Mid Term Cycle

An interesting study is the celebrated book by Alesina and Rosenthal (1995). From US data, it concluded the following:

(1) Presidential elections are more influenced by political business cycles than elections for the Senate and the House of representatives. Both partisanship and competence constitute the building blocks needed for successfully analyzing the voting outcome.

(2) There is a mid term cycle in which the party occupying the White House tends to lose in mid term elections. This implies divided government, which voters seem to want.

(3) Voters prefer moderate policy outcomes. Hence voters' rationality is the driving factor behind the observed mid term cycle. Therefore, the voters vote such that the party occupying the White House is balanced with the presence of the opposition in the Congress. This is notwithstanding the basic assumption that a polarized citizenry is reflected in terms of a partisan political party structure.

(4) However, the above outcome does not drive a categorical result. Voting behavior does not necessarily reflect rational behavior in that at any time the voter can oppose the political party, she preferred only a short period, e.g., two years, before.

(5) The voters resort to the constitutional framework of checks and balances to better exploit executive-legislature interaction in policy formulation. Thus there is some incongruence between the existence of the partisan outlook of the political parties and the voters' not so rational fundamentals.

(6) The resulting policy-space finally becomes a low dimensional one. Because it is always a moderate policy outcome that the electorate supports.

(7) Such a mid-term cycle does not explain fully the underpinnings of the electoral process. To illustrate, if voters prefer only moderate outcomes, then both political parties need not adopt different standpoints. They can just as well be very close to each other as in the Downsian median voter theorem. This also leaves open whether or not the political parties are a reflection of basic structure of voters' preferences. What forces shape the political parties' partisan preferences when the final policy outcomes are moderate and middle-of-the-road?

3.12 Relevance of Political Macroeconomic Models

Note that most of these models and empirical findings pertain to US and other developed countries. Although rational expectations and rational choice paradigm are a success, the partisan orientation of the political structure cannot be brushed aside altogether. To sum up, no single hypothesis seems to account for all the variations.

3.12.1 Institutional Structure: Its Relevance

The impact of institutional design on macroeconomic policy has been analyzed by Alesina and Drazen (1991); Roubini and Sachs (1989); Grilli, Masciandaro and Tabellini (1991); and Alesina and Perotti (1995). As analyzed above, a majoritarian electoral system pushes the political structure to be a two-party one. Even rent seeking can also take different forms coming about through different channels depending upon existing levels of corruption,

politician-criminal nexus and so on. Therefore, both a country's social structure and existing institutional design matter a great deal for research in political economy.

3.12.2 Informational Asymmetry

"Informational Asymmetry" is also another major dimension for research. With rational expectations (RE) and choice based thereon, voters may not possess perfect information. This leaves some scope for the politician to be strategic and opportunistic. By and large from 1985 onwards, politico-macroeconomics has incorporated RE models. The RE models are further augmented with the existence of policy makers' competence, and informational asymmetry.

3.13 Developing Countries' Situation

Thus far, therefore, existing political economic research and empirical evidence pertain mostly to the developed world. Perhaps for this reason, with little poverty prevailing in such countries, it has not been of much relevance. When we consider the developing country context, however, a model must possess additional dimensions so as to have greater explanatory power. The politico-macroeconomic model that is examined here is aimed specifically for a developing country and especially for India where a competitive democracy prevails with the poor voters, who live below poverty line while having equal political rights of voting. Rents are of two types, i.e., endogenous and monetary rent

referring to the prevailing corruption and non-monetary, i.e., that which a political party / leader derives while in office. The impact of the policy making on the developing process (specifically on the level of infrastructure development) is analyzed.

The model can be called a rational opportunistic one with the following objectives:

(1) Opportunistic policy cycle is generated in the model based on rational expectations.

(2) The retrospective voter hypothesis is the basis for optimization of representative citizens' utility. Thus voters are retrospective and rational. That is, the voters take into account the present incumbent's past performance and incorporate it while deciding to vote for or against it.

(3) The focus is largely on the composition of government spending which varies from state to state within India as well as over time. It has strong implications for the development of physical infrastructure.

(4) The competence factor coupled with information asymmetry brings out the cost of most competent (rent that the politician is able to appropriate) in terms of rational opportunistic cycles.

(5) The retrospective analysis can yield opportunistic behavior and generate rents to politicians even when voters are rational. This is in the sense that the voter must

judge the present incumbent with one component based on his competence during the year and the other with a probabilistic construction.

CHAPTER 4

THE POLITICAL ECONOMY OF STATE OFFICE HOLDER BEHAVIOR IN INDIA

4.1 Introduction

Concept of "Democracy" operates in a paradigm that includes both the institutional structure and the legal framework. At its very core lies the need to ensure the accountability of public officials and the adequacy of government performance. Periodic elections are the major instrument for ensuring this. The electorate engages in elections as a device for disciplining the policy makers and thereby increasing the accountability of office-holders. The threat of non-reelection constrains the opportunistic behavior of rent-seeking political leaders. At the same time, elections play a role in rewarding competence and superior performance.

Uncertainty about reelection / continuation in office has a major bearing on the decision making process. While satisfying a certain minimum level of performance expectations on the part of the voters, political leaders maximize their rent. The constraint set of the policy maker is thus shaped by uncertainty about voting outcomes. Analyses of the objectives and constraints of the political executive can be used to explain why policy makers do what they

do. Such analyses are especially relevant in developing economies and especially in those like India which try to achieve political unity within a highly diversified socio-cultural milieu.

In the belief that a theoretical construct can be very useful in this respect, we develop a model to better understand the mechanism and the constraints that the political leader faces. To determine the validity and relevance of the political economy model, we subsequently attempt to test the model empirically. This is the purpose of this research. Since efficient and timely implementation of infrastructure development projects is extremely important for achieving development, it receives special focus in this study.

4.2 Motivation for the Study

The motivation for the research derives largely from my work experience in India, at various decision-making levels. The experience has been both in policy making and implementation within the Indian Administrative Service. The trade off in this respect can be best explained by the following illustration:

(a) Suppose that the state exchequer can provide $1 million every year for the next 10 years, thus implying that the total fund availability over the 10-year period is $10 million. Suppose also that there are 10 projects, each costing $1 million. With an

optimum allocation of financial resources, each project can be completed in 2 years, with an equal amount (i.e., $0.5 million) being provided to a project each year.

An optimum solution to the above obviously is that in the first year, work should be initiated on two projects. The two projects should be selected on the basis of some criterion like number of people likely to be benefited, ease of implementation, deprivation / poverty level of the covered area and so on. By the end of second year these first two projects should be completed. Benefits from these would start accruing immediately thereafter. In the third year, two other projects should be taken up from the remaining eight projects. In this way, all the projects should be implemented sequentially.

More often than not we find that all the 10 projects are approved simultaneously, each continuing for 10 years in the development stage, hence remaining incomplete throughout. This deprives the local area and the residents thereof of the benefit equal to 40 project years within the first 10 years alone. This is because, had the decision making been as suggested above, two projects initiated and completed every two years, the benefit would have been there for 16 project years from the first and 12 project years for the next two projects completed by end of the fourth year and so on until the end of the ten years. By contrast approval of new projects in the subsequent period often results in insufficient allocations of funds to ongoing projects.

(b) We further enrich the illustration as follows:

Suppose that 65% of each project's required outlay consists of expenditure on materials and 35% on the labor. Suppose also that the two different sequences of expenditure in terms of these labor and material components are as follows:

Stage I (30% labor and 10% material)
(Sequentially)

i)	Labor component	15%
ii)	Material component	10%
iii)	Labor component	15%

Stage II (5% labor and 55% material)

iv)	Material component	50%
v)	Labor and Material	10%

In a developing country perspective like India, this is a typical breakdown of expenditures in the labor and material components in general irrigation and road projects, which provide primarily employment opportunities for unskilled labor.

With pervasive poverty and unemployment / underemployment the government is perceived to be more competent if it can provide employment to the unskilled rural labor force, especially during agriculturally non-active periods. This is a means of gaining approval of larger public expenditures on labor, thus mitigating the consumption shortfalls of poor households for basic needs like food and clothing. When new projects are approved, at the beginning of implementation the expenditure allocation consists of 30% towards labor and 10% in material component in 3 to 1 proportion.

With people's basic consumption needs pressing and resource constraint prevailing, new projects are approved before the older projects can be completed. Incomplete projects are often either abandoned or allowed to proceed at a very slow pace, leading to degeneration of the partly-created asset. Thus, we find many incomplete projects that are put on hold while new ones are approved time and again. This is more due to severe financial constraints, in the face of overwhelming demand on the government to provide wage employment to unemployed unskilled poor population.

On the one hand, it meets the basic economic requirements of consumption and gives political mileage simultaneously to the party in power. Intuitively, it is obvious that it results in economic inefficiency, although it can be said to be vote maximizing in the short run and hence politically expedient. Its implications are very clear, resulting in qualitatively and quantitatively poor infrastructure, which is also inadequate due to its thin and wide spatial spread. The compulsions of poverty and hence the necessity to meet the immediate consumption needs of the vast populace is the determinant of such a policy-outcome.

Let us consider the following data comparing drought management in the U.S. state of California with that in the Indian state of Rajasthan. To put them in proper perspective, the states of California and Rajasthan have populations of 35 million and 56 million, respectively; their GDPs are about $1200 billion and $15 billion, respectively.

In the worst five years of drought (1987 – 1992), the state of California incurred expenditure on drought relief of $107 million (for the total period of 5 years) as follows:

Table 4.1 **EXPENDITURE ON DROUGHT IN CALIFORNIA (1987-1992)**

Purpose / Activity	Amount ($ million)
Water Supply augmentation	34.8
Water Recycling Project	10.0
Forestry and Fire protection	33.6
Fisheries and Wild life (Incl. revenue loss offsetting)	24.2
Miscellaneous	4.49
TOTAL:	107.09

By contrast, in Rajasthan (meteorological / agricultural) year 2002-2003 was one of the worst drought years. The expenditure from the state exchequer for this single-year of severe drought was as follows:

Table 4.2 **EXPENDITURE ON DROUGHT IN RAJASTHAN (2002-2003)**

Purpose / Activity	Amount ($ million)
Employment generation	370.52
Cattle conservation measures	74.81
Input Subsidy	62.13
Drinking Water augmentation	14.80
Nutritional Supplement	8.89
Gratuitous Relief	2.04
Miscellaneous	1.75
TOTAL:	534.94

In Rajasthan state, approximately 20% of the population was provided the wage employment during peak-drought and the expenditure amounted almost to 3.56% of state GDP. Thus the demand for wage employment by the population was a high priority for the government. Yet, even within a developing country like India, we find wide variation between different states. In a pioneering study, wherein scope is limited to the comparative study of three states (Kerala, West Bengal and Uttar Pradesh) Amartya Sen (1997) commented as follows:

> Kerala's achievements in the social fields have been quite remarkable, including an achieved life expectancy of well over 72 years (69 for males and 74 for females by 1991) that compares well with China's (69 years) and South Korea's (71 years) achievements, despite the much greater economic advancement of these other countries.
>
> At the other end, Uttar Pradesh (UP) remains one of the most backward states in India. Had this state of 140 million people been an independent country, it would have been not only one of the largest, but also one of the most socially deprived countries in this world giving its citizens less than some of the worst performing economies in sub-Saharan Africa.[14]

Note that on a size of population basis, UP would have been ranked only behind China, India, Indonesia, Brazil, Russia and the US in the entire world. India's states of Orissa and Bihar rank even lower than UP (within the scope of study for the book) in development indicators. Thus, studying UP can be compared to that of Bangladesh and Ethiopia.

A World Bank study (2003) has characterized Indian poverty as follows:

> Pervasive in India, poverty is becoming more concentrated in the country's lagging states and rural areas. More than half of India's poor now live in Bihar, Madhya

[14] Dreze and Sen (1997): p3.

> Pradesh, Orissa and Uttar Pradesh – more than two-thirds in rural areas. In rural areas, the poverty incidence is highest amongst agricultural workers, many of them small-scale farmers or casual laborers....
>
> India's poor suffer from lower incomes and from lower access to and quality of such public services as basic health, education and infrastructure, all low in quality.[15]

The wide differences in poverty and other indicators between different Indian States need no further emphasis. Hence, an inter-state study of India can be very rewarding and research worthy.

4.3 Scope of Present Research

In this research, the individual states of India are taken as the units of analysis. A theoretical model is developed keeping in view the politico-economic context in a developing country. The scope is the infrastructure development projects, especially where unskilled labor is provided wage employment, like irrigation and road works. This is not to deny the importance of other programs like redistribution, transfer payments, special poverty-alleviation efforts and so on.

The model attempts to depict the situation in a typical less developed / developing economy, characterized by a low level of per capita income and widespread poverty. Preceding an election, many new projects are announced in an attempt to signal the competence of the incumbent political party. As a result, the total amount of resources available is spread over a

[15] World Bank (2003): p (ii).

large number of new projects. Given the severity of financial resource constraints and the political rent to be gained from announcing the start of new infrastructure projects, often only token allocations (which provide primarily temporary employment in term of public consumption goods), this leads to an economically inefficient outcome. It is proposed to undertake empirical research to verify this model on the basis of budgetary expenditures in the states of India.

4.4 Basic Tenets of the Model

Following are the salient features of political and economic decision making in a developing economy.

(i) Policy makers are opportunistic. They utilize all available avenues to further their electoral prospects and more importantly to cultivate their political constituency.

(ii) The announcement of new development projects increases their chances of reelection and continuation in office. It is looked upon as a special privilege conferred by the incumbent political party in the particular neighborhood and increases the party's competence in voters' perception. Because, with widespread poverty and a sizeable section of the society living below poverty line (about $1 per day per capita in India) such projects provide employment opportunities and consequently the means of livelihood to such marginalized sections of the society.

However, voters take into account the past performance of the incumbent government and are retrospective on this account, as well.

(iii) This not only results in announcements of large numbers of projects, but such projects are also geographically dispersed. The thin and wide dispersion of projects, along with the lack of adequate financial resources results in unusual delays in the implementation of such development projects and lowers benefit-cost calculations.

The focus here is to develop a theoretical model. The theoretical construct must recognize the following dimensions of the issue.

(i) Incumbent political decision-makers faced with competitive elections practice opportunistic behavior, this resulting in excessive dispersion of initial project approvals, in both spatial and quantum dimensions.

(ii) Conflicts among policy makers often aggravate the situation further. The structure of the government and budgetary institutions (like committees of legislature) allows this to be even more widespread. Hence, different legislators representing different social, economic strata demand new projects for their areas, even if with only token initial allocations. This is perceived as competence signaling. This is especially obvious in the Indian context characterized by social heterogeneity and diversity.

(iii) Such announcements can serve as a strategic variable linking the current to future governments, especially in the context of the severe financial constraints prevailing in developing countries.

(iv) Interaction between the legislature and executive within a parliamentary system (as in India), where the very existence of the political executive is contingent on having a majority in the legislature, gives the legislators more power in their claims on new projects.

I develop a theoretical model, capturing the essentials of the reality in such a decision-making process. Large numbers of new projects are announced, each having a small allocation. This implies that a large share of budgetary resources will be devoted to employment generation and thereby allow the local households to better their day-to-day household consumption needs. This contributes more towards fulfilling the immediate consumption needs of the electorate than to increasing the permanent capital asset base. In the process, it adds many projects to the shelf of incomplete projects and explains why infrastructure development lags behind what it should be in a developing economy like India. Due to the lack of financial resources sufficient for taking the large number of projects to completion, the assets of the incomplete projects also deteriorate in quality.

The theoretical construct, thus, must take cognizance of the following dimensions:

a) Citizens obtain higher utility from wage-employment because, it meets their household consumption needs,

b) Rational and opportunistic behavior of political leaders, and

c) While providing for rent, non-monetary benefits of holding office enjoyed by the politician and its impact on the policy decisions.

4.5 The Model

4.5.1 The Preference of a Representative Voter

The citizenry consists of large numbers of identical voters, though varying in wealth. Since it is a study of different states, the relative deprivation of these different states would be relevant to the analysis. The impact on the infrastructure projects of inter-state income differential can be evaluated. Each citizen derives utility from private and publicly supplied consumption goods, and public infrastructure / investment goods. The citizen's utility at time t is given by

$$\max_{\tau_t, p_t, g_t, s_t} \quad u^c{}_t = h\left(\frac{\bar{y}}{y}, P\right)\left[u(p_t, g_t) + \beta v(dk_t)\right] + f(g_t, k_t, s_t) \qquad (1)$$

subject to

$$p_t = y_t - \tau_t, \tag{2}$$

$$dk_t = (\tau_t \varepsilon_t - g_t - s_t)(1-r), \tag{3}$$

$$k_t + dk_t = k_{t+1}, \text{and} \tag{4}$$

$$dk_t, p_t, s_t, g_t \geq 0.$$

where y_t is the exogenous income,

τ_t is the tax collected by the government,

p_t is the private consumption good,

g_t is the govt.-provided consumption good,

ε_t is indicative of competence of the government,

s_t is the expenditure on sovereign regulatory functions, such as police, judiciary, jails and etc,

r is the rent proportion,

dk_t is the new addition to the capital asset base,

k_t is the capital asset base available to the voter at the beginning,

β is the discount factor,

$\frac{\bar{y}}{y}$ indicates the income differential; the numerator is the GDP per capita, of the state that has the highest among the Indian states while the denominator is of the particular state,

P is the ratio of people living below the poverty line and

f is the function bringing out the utility from complementarities between the consumption goods, the existing infrastructure, and the law and order situation. We differentiate between the consumption and investment goods, keeping in view the reality of developing economies.

u, v and f are all standard strictly concave functions, with $u_1, u_2, v', f_1, f_2, f_3 > 0$, satisfying the usual Inada conditions, i.e.,

$$u(0) = 0$$

$$u'(0) = \infty$$

$$u'(\infty) = 0.$$

$$\lim_{k \to 0} v(k) = -\infty$$

The coefficient h indicates the relative importance of consumption for the utility of representative agent. The concavity implies that at lower levels of income per capita the utility is more than at higher levels. Hence this captures its multiplicative impact on utility given the same consumption quantity. To illustrate, the poorer the citizen, the higher would be $\bar{y} / y$. Consequently, an extra $ of consumption offered to such a representative citizen would shift his / her utility by a larger magnitude.

P is the poverty measure, specifically the percentage of the state's population which lives below the poverty line. A larger poverty ratio implies a large percentage of poor people in that particular state. With greater poverty, more population would be poor and hence more would tend to obtain greater utility from the same amount of consumption. Thus small economic benefits would ensure greater utility change among a larger percentage of the population.

Thus the tradeoff between political position and economic benefits is captured in terms of these two parameters. As we analyze, we can see that this unique linkage contributes substantially to our analysis. A poorer state would have higher value for *h*-term (incorporating income level and prevailing poverty) and consequently an extra $ of consumption would increase its utility by a greater magnitude. Similarly, the higher is *P* (Poverty ratio), the more likely the poor would be a majority which would get greater utility from the same amount of consumption.

4.5.2 Technology

In each period, the representative citizen receives *y* units of exogenous income. The government collects τ_t, a lump sum tax from the citizen. The citizen is consequently left with private consumption good:

$$p_t = y_t - \tau_t, \qquad (2)$$

In addition to the taxes, the model takes into account the resource-augmenting capability of political leaders, which influences the final output. We index such administrative competency by ε. High ε signifies a more competent administrator. A highly competent leader provides a given level of public goods at a relatively lower level of taxes.

Incorporating competence in a simple way we have the public goods function given by

$$dk_t = (\tau_t \varepsilon_t - g_t - s_t)(1-r), \qquad (3)$$

where dk_t is the additional public investment good added to the existing asset k_t at time t. Thus, we have

$$k_t + dk_t = k_{t+1} \qquad (4)$$

In the above equation (3) g_t is the government expenditure (on such irrigation and road projects), which mostly goes for providing employment to poor unskilled labor, and thereby for immediate consumption needs of such poor households, s_t is the expenditure on sovereign regulatory functions such as police, judiciary, jails and etc., r is the rent. f is the function bringing out the utility from complementarities between the consumption goods; the existing infrastructure and law and order situation, in the following utility component:

$$f(g_t, k_t, s_t)$$

In period t, the citizen's utility depends upon the public consumption good (g_t) and the asset base, existing at the beginning of the period t, k_t. He can derive utility from new addition dk_t, only from the next period where it becomes a part of the asset base, (completed infrastructure) i.e., k_{t+1}.

4.5.3 Stochastic Structure

The society chooses its leader from amongst its citizens, as in a democracy. The administrative competence differentiates the citizens. For each political leader (l), the administrative and leadership competence evolves according to the following serially correlated stochastic process.

$$\varepsilon_t = \alpha_{t-1} + \alpha_t \qquad (5)$$

Where each α is an independent drawing from

$$\begin{aligned} \rho \quad &\equiv \text{prob}\,(\alpha = \alpha^H), \\ 1 - \rho &\equiv \text{prob}\,(\alpha = \alpha^L), \text{ and} \\ \alpha^H &> \alpha^L > 0. \end{aligned} \qquad (6)$$

We assume that competence follows a first-order moving average process. This simplifies our analysis to a two-period framework.

Asymmetry of information is crucial to the model. This exists in the following two ways.

a) Voters do not know about the opponent at the time they must vote. Thus, the opponent's competence is inferred from the probability structure.

b) At time t, the citizen knows only about the incumbent's competence in the previous period (i.e., ε_{t-1} or $\propto_{t-1}$, a component of current period's competency). But the political leader does know his own competence, $\propto_t$. This gives rise to asymmetry of information between the incumbent political leader and the citizen. This also makes rent possible.

4.5.4 The Political Leader's Utility Function

In a democratic setting, the political leaders are chosen from amongst ordinary citizens through a voting system. The leader derives utility as a citizen in the same way as a normal citizen does. But, in addition, the political leader receives rent and non-monetary benefits (like the prestige, social standing, ego-boost and etc.) while holding office. So leader's utility function is given by

$$u^l = u^c + r(\tau_t, dk_t) + R(g_t, dk_t) \qquad (7)$$

u^c is the component available to every citizen. R, the non-monetary benefits that the political leader enjoys by holding office (For example, social prestige, standing, ego rent etc.) is in

addition to the rent given by $r(\tau_t, dk_t)$. R depends upon g_t, government supplied consumption goods. The higher g_t is the larger will be the political rent. dk_t is the addition to the permanent asset. Although the representative citizen has to wait until period (t + 1), to receive the benefits from dk_t the political leader (incumbent) gets political mileage with the approval of project and the initial budgetary provision made therefor. This also brings out the informational advantage of the leader. Rent prospects are not incorporated in the ordinary citizen's utility function, because of the infinitesimal probability of a voter getting elected to office with a large population base.

Note that the fact that the citizen's utility function is one component of the leader's utility (it being a democratic structure) implies that the political leader is interested in social welfare. That is she puts some weight both on social welfare and the rent, which she receives while holding office.

4.5.5 The Timing of Events and the Information Structure

The timing of events is as follows:

t - 1			t
Leader observes α_t and sets τ_t, g_t dk_t and thereby k_{t+1}.	Voter observes τ_t, g_t, k_t and knows α_{t-1}.	Voting takes place.	Winner takes office.

Figure 4.1 Timing of Events.

The sequence is repetitive, except that elections are held every other period. Thus we get the timing of events as under.

t - 1	t	t + 1	t + 2
(≡ t = 0)	(Election)		(Election)

Figure 4.2 Timeline showing Sequence of Elections

Asymmetry of information is crucial to the model. This exists in the following two ways.

(a) Voters do not know anything about the opponent at the time of the election. Thus the opponent's competence is inferred from the probability structure of competence.

(b) At time t, the citizen knows only about incumbent's competence in the previous period (i.e., ε_{t-1} or $\propto_{t-1}$, a component of current period's competence). Since the leader does know his own competence, $\propto_t$, this gives rise to asymmetry of information between the incumbent political leader and the citizen.

It may be noted here that after observing τ_t, s_t and g_t at period t, logically the citizen can guess (although not exactly infer) about the incumbent leader's competence. However, the same cannot be confirmed until the following period, when the citizen certainly comes to learn of $k_{t+1} = k_t + d k_t$ and $\varepsilon_t = \propto_{t-1} + \propto_t$. Thus, the political leader has a temporary edge in information availability and its structure. One may think of such an information structure from the angle of costs associated with information gathering.

Expenditure on sovereign regulatory functions is also a choice of the political leader. There is a trade-off while selecting s_t. It reduces the addition to the capital asset base, on one hand, and, on the other, supplements the utility arising from the complementarities between the consumption goods, the existing infrastructure and prevailing law and order situation.

Regarding the opponent, the only knowledge available is the probability distribution of $\propto$, as we described earlier. The representative citizen can decide about vote on the basis of expected utility, given the probability distribution of $\propto$ and available information at time t.

4.6 Equilibrium with Full Information

We first analyze the equilibrium under full information, i.e., where voting citizens can observe $\propto_t$ prior to voting. With no informational imbalance or asymmetry, the rent disappears. That is, the leader (in such a case she can be equated to a benevolent dictator) would optimize the citizen's utility function. So the problem is to maximize the following function:

$$\max_{\tau_t, p_t, g_t, s_t} \quad u^c{}_t = h\left(\frac{\overline{y}}{y}, P\right)\left[u(p_t, g_t) + \beta v(dk_t)\right] + f(g_t, k_t, s_t) \qquad (1)$$

subject to

$$p_t = y_t - \tau_t, \tag{2}$$

$$dk_t = (\tau_t \varepsilon_t - g_t - s_t), \tag{3}$$

$$k_t + dk_t = k_{t+1}, \text{ and} \tag{4}$$

$$dk_t, p_t, s_t, g_t \geq 0.$$

Substituting the budget constraint in the above equation we get,

max

$$\tau_t, s_t, g_t \qquad u^c{}_t = h(\underline{\bar{y}}, P)\,[\,u(y_t - \tau_t, g_t) + \beta v(\tau_t \varepsilon_t - g_t - s_t)\,] + f(g_t, k_t, s_t) \tag{8}$$

subject to $\quad g_t, (y_t - \tau_t), (\tau_t \varepsilon_t - g_t - s_t) \geq 0.$

We have the following first order conditions:

$(\tau_t:)$ $\quad -h u_\tau + h\beta v_\tau = 0.$

$$\Rightarrow \quad u_\tau = \beta v_\tau \tag{9}$$

$(g_t:)$ $\quad h u_g - h\beta v_g + f_g = 0$

$$\Rightarrow \quad h u_g = h\beta v_g - f_g \tag{10}$$

$(s_t:)$ $\quad -h\beta v_s + f_s = 0$

$$\Rightarrow \qquad h\beta v_s = f_s \qquad (11)$$

The above points to a unique { $g^*(\varepsilon)$, $\tau^*(\varepsilon)$, $s^*(\varepsilon)$ } which would be the solution to the problem. The maximized utility becomes:

$$u^*\ [g^*(y, \varepsilon), \tau^*(y, \varepsilon), s^*(y, \varepsilon), \ y, \ \varepsilon, \ \underline{y}, \ P\ ] \qquad \Rightarrow \quad u^*(y, \ \varepsilon, \ \underline{y}, \ P).$$

The utility increases with y, g, ε, $\underline{y}$ and P and decreases with τ.

Given the functional forms (which we detail out in 4.9.2 later), we can analyze the results of the above equilibrium. It may be noted here that the above case implies basically a "no political leader situation". In such a case, the optimum consumption good (both private and public included) is given by

$$g_f \quad = \quad (h_1 \underline{y} + h_2 P)\beta a / b c.$$

The optimum level of tax, expenditure on sovereign functions and the net addition to capital base would be as follows:

$$\tau_f \quad = \quad y - \beta a \varepsilon + (h_1 \underline{y} + h_2 P)\beta a / b c$$

$$s_f \quad = \quad (h_1 \underline{y} + h_2 P)\ \beta a (1 - \varepsilon)\ / b c \ - \ a k / b$$

$$dk_f = y\varepsilon + ak/b - 2(h_1 \bar{y}/y + h_2 P)\beta a(1-\varepsilon)/bc - \beta a \varepsilon^2$$

Consequently, the maximized utility would be:

$$u_f = (h_1 \bar{y}/y + h_2 P)\beta a(y\varepsilon + ak/b) - (h_1 \bar{y}/y + h_2 P)^2 \beta^2 a^2 (1-\varepsilon)/bc - (h_1 \bar{y}/y + h_2 P)\beta^2 a^2 \varepsilon^2/2, \text{ and}$$

$$Rent_f = 0$$

An f subscript indicates the absence of rent (Because of full information). This indicates one end of the spectrum wherein there is no scope for either rent or non-monetary benefits for the political leader.

4.7 Citizen's Optimization under Asymmetric Information

Under asymmetric information, voters cannot directly observe ε_t and dk_t. The information as to the same is available only in next period (t + 1). Under such circumstances, the stochastic structure that we characterized earlier, gives us the result.

The citizen's expected utility with the incumbent leader in office, takes into account the probability of $\alpha_t = \alpha^H$ (with probability=ρ) and α^L (with probability equal to $1 - \rho$) otherwise. So we have

$$E_t(u^{ci}_{t+1}) = \rho u^c_t(\varepsilon^H, \underline{\bar{y}}_y, P) + (1-\rho) u^c_t(\varepsilon^L, \underline{\bar{y}}_y, P) \qquad (12)$$

where $\varepsilon^I = \alpha_{t-1} + \alpha^I, \quad I = H, L.$

and we ignore the discounting in both cases for simplicity.

The voters have no knowledge about the opponent at the elections. Hence, the probability structure gives:

$$E_t(u^{co}_{t+1}) = \rho[\rho u^c_{t+1}(\alpha^H + \alpha^H) + (1-\rho) u^c_{t+1}(\alpha^L + \alpha^H)] +$$
$$(1-\rho)[\rho u^c_{t+1}(\alpha^H + \alpha^L) + (1-\rho) u^c_{t+1}(\alpha^L + \alpha^L)]$$

$$= \rho^2 u^c_{t+1}(\alpha^H + \alpha^H) + 2\rho(1-\rho) u^c_{t+1}(\alpha^H + \alpha^L) +$$
$$(1-\rho)^2 u^c_{t+1}(\alpha^L + \alpha^L). \qquad (13)$$

$$\Rightarrow \quad E_t(u^{co}_{t+1}) = \rho^2 u^c_{t+1}(\varepsilon^{HH}, r, y, \underline{\bar{y}}_y, P)$$
$$+ 2\rho(1-\rho) u^c_{t+1}(\varepsilon^{HL}, r, y, \underline{\bar{y}}_y, P) + (1-\rho)^2 u^c_{t+1}(\varepsilon^{LL}, r, y, \underline{\bar{y}}_y, P).$$

Obviously, the incumbent will be voted to power if and only if,

$$E_t\,(u^{ci}_{t+1}) \;\geq\; E_t(u^{co}_{t+1}). \qquad (14)$$

The above inequality puts a constraint on the incumbent leader in terms of $\underline{g}$ (a minimum) and $\bar{\tau}$ (a maximum). Thus, the citizen's utility function puts a constraint on the incumbent, if he values political office and wants to get re-elected. That is, it marks operational latitude in a (g, τ) space. It may be noted here that, even if for analytical purposes, the citizen assigns a different probability structure to opponent political party; it would not change our analytical result. This is because, once the probability structure and competency attached are known, we can find the two constraints, i.e., $\underline{g}$ (a minimum) and $\bar{\tau}$ (a maximum).

4.8 Leader's Utility Optimization Problem under Asymmetric Information.

The leader's utility is given by

max

$$\tau_t, s_t, g_t \quad u^l_t = h\left(\underline{\bar{y}}^{y}, P\right)[u(p_t, g_t) + \beta v(dk_t)] + f(g_t, k_t, s_t) + r(\tau_t, dk_t) + R(g_t, dk_t), \qquad (15)$$

This is equivalent to (incorporating budget constraint)

$$u^{l}_{t} = h\left(\frac{\bar{y}}{y}, P\right)\left[u(y_t - \tau_t, g_t) + \beta v(\tau_t \varepsilon_t - g_t - s_t)(1-r)\right] + f(g_t, k_t, s_t) + r(\tau_t \varepsilon_t - g_t - s_t) + R\left[g_t, (\tau_t \varepsilon_t - g_t - s_t)(1-r)\right] \quad (16)$$

subject to $g_t, (y_t - \tau_t), (\tau_t \varepsilon_t - g_t - s_t) \geq 0.$

We get the following first order conditions:

$(\tau:)$ $h(-u_\tau + \beta v_\tau) + r_\tau + R_\tau = 0$

$$\Rightarrow \quad h u_\tau = h\beta v_\tau + r_\tau + R_\tau \quad (17)$$

$(g:)$ $h(u_g - \beta v_g) + f_g - r_g + R_g = 0.$

$$\Rightarrow \quad h u_g + f_g = h\beta v_g + r_g - R_g \quad (18)$$

$(s:)$ $-h\beta v_s + f_s - r_s - R_s = 0.$

$$\Rightarrow \quad f_s = h\beta v_s + r_s + R_s \quad (19)$$

The above first order conditions, we may interpret as under:

(a) $h u_\tau = h\beta v_\tau + r_\tau + R_\tau \quad (17)$

The marginal utility in consumption good with change in tax must equal the discounted value of the marginal utility in investment good and the marginal change in rent and non-monetary political benefits due to the change in tax.

$$\text{(b)} \qquad h\,u_g + f_g = h\beta v_g + r_g - R_g \qquad (18)$$

The marginal utility of the change in the consumption good must equal difference between the discounted opportunity cost of foregone utility in the investment good plus the foregone rent and change in non-monetary political benefits.

$$\text{(c)} \qquad f_s = h\beta v_s + r_s + R_s \qquad (19)$$

The marginal utility with respect to the change in allocation for sovereign functions must be equal to the opportunity cost of foregone investment good plus the difference in the endogenous rents and non-monetary political benefits.

These conditions are consistent with economic intuition. We have taken here the case which provides for both the rent and non-monetary political benefits (a real world politician). Subsequently, we also analyze cases where the political leader only cares for endogenous rent and does not bother about non-monetary benefits of holding political office (sort of mercenary). Another end of the spectrum can also be the political leader who values very highly the political office and does not intend to take any rent (a real benevolent without any

monetary rent). To visualize the implications clearly and to better understand the model's working we specify the functional forms in each of these cases.

4.9 Functional Forms and Inferences

4.9.1 Optimization under Asymmetric Information (with rent 'r' and no non-monetary benefits, 'R = 0')

We have the following functions, as outlined above. The utility of the representative citizen is given by

$$u^c_t = h\left(\frac{\bar{y}}{y}, P\right)\left[u(y_t - \tau_t, g_t) + \beta\, v(\tau_t\, \varepsilon_t - g_t - s_t)(1-r)\right] + f(g_t, k_t, s_t) \quad (1)$$

is assumed to take the following form:

$$u^c_t = \left(h_1 \frac{\bar{y}}{y} + h_2 P\right)\left[\tfrac{1}{2}(y_t - \tau_t + g_t)^2 + \beta\, a\,(\tau_t \varepsilon_t - g_t - s_t)(1-r)\right] + c\, g_t(a k_t + b s_t). \quad (20)$$

The rent is appropriated by the political leader. Therefore, it does not figure in the citizen's above utility function. But, while optimizing the political leader's utility function includes the rent as under:

$$u^c_t = \left(h_1 \frac{\bar{y}}{y} + h_2 P\right)\left[\tfrac{1}{2}(y_t - \tau_t + g_t)^2 + \beta a(\tau_t \varepsilon_t - g_t - s_t)(1-r)\right] + c\, g_t(a k_t + b s_t) + n r(\tau_t \varepsilon_t - g_t - s_t) \quad (21)$$

Clearly, as would seem realistic in a developing country, the consumption good gives more utility than the public investment good. Hence, the square of the consumption good is what appears, to before, it is multiplied by the relative income differential ($\bar{y}/y$) and poverty ratio (P).

With the above, we obtain the following first order conditions.

$$(\tau:) \quad -\left(h_1 \frac{\bar{y}}{y} + h_2 P\right)\{(y - \tau + g) + \beta a \varepsilon (1-r)\} + n r \varepsilon = 0 \quad (22)$$

$$(g:) \quad \left(h_1 \frac{\bar{y}}{y} + h_2 P\right)[(y - \tau + g) - \beta a(1-r)] + c(ak + bs) - n r = 0 \quad (23)$$

$$(s:) \quad -\left(h_1 \frac{\bar{y}}{y} + h_2 P\right)\beta a(1-r) + b c g - n r = 0 \quad (24)$$

This enables us to get the optimizing solution of g_r, τ_r, s_r and the corresponding values of dk_r, $Rent_r$ and u_r ; with subscript r indicating the presence of endogenous rent only as follows:

$$g_r = \left(h_1 \frac{\bar{y}}{y} + h_2 P\right)\beta a(1-r)/bc + n r / b c \quad (25)$$

$$\tau_r = y - \beta a \varepsilon + \left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a / b c + \beta a r \varepsilon$$

$$- \left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a r / b c - n r \left(\varepsilon / h - 1 / b c \right) \quad (26)$$

$$s_r = \left[\left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a (1-r) + n r \right] (1 - \varepsilon) / b c - a k / b \quad (27)$$

$$dk_r = (1-r) \left(y \varepsilon + a k / b \right) - \left[\left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a (1-r) + n r \right]$$

$$2(1-\varepsilon)(1-r) / b c - \beta a \varepsilon^2 (1-r)^2 - n r (1-r) \varepsilon^2 \left(h_1 \frac{\bar{y}}{y} + h_2 P \right)^{-1}$$

(28)

$$u_r = \left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a (1-r) \left(y \varepsilon + a k / b \right) - \left[\left(h_1 \frac{\bar{y}}{y} + \right. \right.$$

$$\left. h_2 P \right)^2 \beta^2 a^2 (1-r)^2 - n^2 r^2 \left] (1-\varepsilon) / b c + \left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta^2 a^2 \right.$$

$$(1-r)^2 \varepsilon^2 / 2 + n^2 r^2 \varepsilon^2 \left(h_1 \frac{\bar{y}}{y} + h_2 P \right)^{-1} / 2 \quad (29), \text{ and}$$

$$Rent_r = r \{ \left(y \varepsilon + a k / b \right) - \left[\left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a (1-r) + n r \right] 2 (1-\varepsilon) /$$

$$b c - \beta a (1-r) \varepsilon^2 - n r \varepsilon^2 \left(h_1 \frac{\bar{y}}{y} + h_2 P \right)^{-1} \} \quad (30)$$

The citizen's utility would be as calculated above. But the optimum values are given by the political leader's utility-based optimized solution, which includes the rent that is taken by the leader only.

4.9.2 Optimization with Full Information (without either rent or non-monetary benefits)

With full information, it is presumed that the rent would be reduced. Taking the other end of the spectrum, i.e., when both the rent is zero and non-monetary benefits are absent, we get the following different optimizing solution of g_f, τ_f, s_f and the corresponding values of dk_f, $Rent_f(=0)$ and u_f ; with subscript f indicating the availability of full information and thus the absence of rent of any kind.

$$g_f = (h_1 \bar{y}/y + h_2 P)\beta a/bc. \quad (31)$$

$$\tau_f = y - \beta a \varepsilon + (h_1 \bar{y}/y + h_2 P)\beta a/bc \quad (32)$$

$$s_f = (h_1 \bar{y}/y + h_2 P)\beta a(1-\varepsilon)/bc - ak/b \quad (33)$$

$$dk_f = y\varepsilon + ak/b - 2(h_1 \bar{y}/y + h_2 P)\beta a(1-\varepsilon)/bc - \beta a \varepsilon^2 \quad (34)$$

Consequently, the maximized utility would be:

$$u_f = (h_1 \bar{y} + h_2 P)\beta a(y\varepsilon + ak/b) - (h_1 \bar{y} + h_2 P)^2$$

$$\beta^2 a^2 (1-\varepsilon)/bc - (h_1 \bar{y} + h_2 P)\beta^2 a^2 \varepsilon^2/2, \qquad (35) \text{ and}$$

$$Rent_f = 0 \quad \text{(One end of the spectrum)} \qquad (36)$$

4.9.3 Optimization by the Leader under Asymmetric Information (with both rent 'r' and non-monetary benefits 'R')

Next, we analyze the case where both the endogenous rent and non-monetary benefits are present. The utility function is given by

$$u^l_t = h(\bar{y}, P)\,[\,u(y_t - \tau_t, g_t) + \beta\, v(\tau_t \varepsilon_t - g_t - s_t)$$

$$(1-r)\,] + f(g_t, k_t, s_t) + r(\tau_t \varepsilon_t - g_t - s_t)$$

$$+ R\,[\,g_t, (\tau_t \varepsilon_t - g_t - s_t)(1-r)\,] \qquad (16)$$

takes the following functional form:

$$u^l_t = (h_1 \bar{y} + h_2 P)\,[\,\tfrac{1}{2}(y - \tau_t + g_t)^2 + \beta\, a(\tau_t \varepsilon_t - g_t - s_t)(1-r)]$$

$$+ c\, g_t (a k_t + b s_t) + n\, r(\tau_t \varepsilon_t - g_t - s_t) + \tfrac{1}{2} l g_t^2$$

$$+ m(\tau_t \varepsilon_t - g_t - s_t)(1 - r) \qquad (37)$$

With the above, the first order conditions are:

$$(\tau:) \quad -(h_1 \frac{\bar{y}}{y} + h_2 P)(y - \tau + g) + (h_1 \frac{\bar{y}}{y} + h_2 P)\beta a \varepsilon (1-r) + nr\varepsilon + m\varepsilon(1-r) = 0 \tag{38}$$

$$(g:) \quad (h_1 \frac{\bar{y}}{y} + h_2 P)(y - \tau + g) - (h_1 \frac{\bar{y}}{y} + h_2 P)\beta a(1-r) + c(ak + bs) - nr + lg - m(1-r) = 0 \tag{39}$$

$$(s:) \quad -(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a(1-r) + bcg - nr - m(1-r) = 0 \tag{40}$$

Solving we arrive at the optimizing solution of g_R, τ_R, s_R and the corresponding values of dk_R, $Rent_R$ and u_R; with subscript R indicating the presence of both the rent and non-monetary political benefits due to asymmetric information.

$$g_R = [(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a + m](1-r)/bc + nr/bc \tag{41}$$

$$\tau_R = y - \beta a \varepsilon (1-r) - [m(1-r) + nr](h_1 \frac{\bar{y}}{y} + h_2 P)^{-1}\varepsilon + \{[(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a + m](1-r) + nr\}/bc \tag{42}$$

$$s_R = \{[(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a + m](1-r) + nr\}(1-\varepsilon)/bc$$

$$-\{[(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a + m](1-r) + nr\} l/b^2 c^2 - ak/b \quad (43)$$

$$dk_R = (1-r)(y\varepsilon + ak/b) - \{[(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a + m](1-r) + nr\}$$

$$2(1-\varepsilon)(1-r)/bc - [m(1-r)+nr](1-r)\varepsilon^2 / (h_1 \frac{\bar{y}}{y} + h_2 P)$$

$$-\beta a \varepsilon^2 (1-r) + \{[(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a + m](1-r) + nr\}$$

$$(1-r) l/b^2 c^2 \quad (44)$$

$$u_R = (h_1 \frac{\bar{y}}{y} + h_2 P)\beta a(1-r)(y\varepsilon + ak/b) - \{[(h_1 \frac{\bar{y}}{y} +$$

$$h_2 P)\beta a + m](1-r) + nr\}\{(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a(1-\varepsilon)$$

$$+ \tfrac{1}{2}\beta ab c\varepsilon^2 - \tfrac{1}{2}[m(1-r) + nr]bc\varepsilon^2 (h_1 \frac{\bar{y}}{y} + h_2 P)^{-1}$$

$$- [m(1-r)+nr](1-\varepsilon - l/bc)\} / bc \quad (45) \text{ and}$$

$$Rent_R = r(y\varepsilon + ak/b) - r\{[(h_1 \frac{\bar{y}}{y} + h_2 P)\beta a + m](1-r)+nr\}$$

$$\{ 2(1-\varepsilon) / bc + \varepsilon^2 (h_1 \frac{\bar{y}}{y} + h_2 P)^{-1} - 1 / b^2 c^2 \} \quad (46)$$

where the subscript R indicates the presence of both non-monetary benefits and rents.

The optimum g_t in all cases is directly related to the relative income differential and the poverty measure. (People living below poverty line ratio) This is besides other factors that may also form part of the constant. Such factors can be funds available from external assistance (from other governments and multilateral agencies); the amount allocated to such development sectors of economy (like roads and irrigation projects in the present case.) amongst others. Development indicators like the literacy rate and the number of people in the marginalized and disadvantaged sections of society can also be very crucial factors explaining the amount government spends to provide for the immediate living needs of the poor, with the obvious cost in terms of adverse qualitative impact on infrastructure development. We take up these when we test the model empirically. It may also be noted that the resulting citizen's utility upon optimization in the presence of political leader differs from what the citizen can get with full information.

Under asymmetric information, with the political leader (who has information advantage over the citizen) optimizing, the allocation for consumption goods increases. Thus the presence of political rent results in sub-optimal utility.

4.9.4 Optimization by Benevolent Leader (with no rent, r = 0 and high valuation of office / non-monetary benefits R)

We also take up the case of a leader who values the office and yet does not want rent. We have many such leaders first time with the developing countries becoming independent. It is a sort of benevolent political leader. We analyze the case where no endogenous rent is provided, but the non-monetary benefits are highly valued by the political leader. The utility function then would be

$$u^l_t = h(\bar{y}, P)\,[\,u(y_t - \tau_t, g_t) + \beta\, v(\tau_t \varepsilon_t - g_t - s_t)\,] + f(g_t, k_t, s_t) + R\,[\,g_t, (\tau_t \varepsilon_t - g_t - s_t)\,] \quad (47)$$

This takes the following functional form:

$$u^l_t = (h_1 \bar{y} + h_2 P)\,[\,\tfrac{1}{2}(y - \tau_t + g_t)^2 + \beta\, a\,(\tau_t \varepsilon_t - g_t - s_t)\,] + c\, g_t (a k_t + b s_t) + \tfrac{1}{2} l g_t^2 + m(\tau_t \varepsilon_t - g_t - s_t) \quad (48)$$

With the above, the first order conditions, we get, as follows:

$$(\tau:) \quad -(h_1 \bar{y} + h_2 P)(y - \tau + g) + (h_1 \bar{y} + h_2 P)\,\beta\, a\, \varepsilon + m\varepsilon = 0 \quad (49)$$

$$(g:) \quad (h_1 \bar{y} + h_2 P)(y - \tau + g) - (h_1 \bar{y} + h_2 P)\,\beta\, a + c(ak + bs) + lg - m = 0 \quad (50)$$

$$(s:) \quad -(h_1 \frac{\bar{y}}{y} + h_2 P)\,\beta a + b c g - m = 0 \qquad (51)$$

On optimizing we arrive at the solution of g_B, τ_B, s_B and the corresponding values of dk_B, $Rent_B$ and u_B ; with subscript B indicating the presence of only the non-monetary benefits.

$$g_B = [(h_1 \frac{\bar{y}}{y} + h_2 P)\,\beta a + m]/bc \qquad (51)$$

$$\tau_B = y - \beta a \varepsilon - m (h_1 \frac{\bar{y}}{y} + h_2 P)^{-1} \varepsilon$$

$$+ [(h_1 \frac{\bar{y}}{y} + h_2 P)\,\beta a + m] / b c \qquad (52)$$

$$s_B = [(h_1 \frac{\bar{y}}{y} + h_2 P)\,\beta a + m]\,(1-\varepsilon) / b c$$

$$-[(h_1 \frac{\bar{y}}{y} + h_2 P)\,\beta a + m]\,l / b^2 c^2 - a k / b \qquad (53)$$

$$dk_B = (y\varepsilon + a k / b) - [(h_1 \frac{\bar{y}}{y} + h_2 P)\,\beta a + m][2(1-\varepsilon) - l / b c]$$

$$/ b c - m \varepsilon^2 / (h_1 \frac{\bar{y}}{y} + h_2 P) - \beta a \varepsilon^2 \qquad (54)$$

$$u_B = \left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a \left(y\varepsilon + ak/b \right) - \left[\left(h_1 \frac{\bar{y}}{y} + h_2 P \right) \beta a + m \right]$$

$$l m / b^2 c^2 - \left[\left(h_1 \frac{\bar{y}}{y} + h_2 P \right)^2 \beta^2 a^2 - m^2 \right] \left[(1-\varepsilon) / b c \right.$$

$$\left. + \tfrac{1}{2} \varepsilon^2 \left(h_1 \frac{\bar{y}}{y} + h_2 P \right)^{-1} \right] \qquad (55) \text{ and}$$

$$Rent_B = 0 \qquad (56)$$

4.10 Inferences from the Model

An analysis of the optimized values gives us the following picture:

$$g_B > g_f > g_R > g_r \qquad (57)$$

$$\tau_r > \tau_R > \tau_f > \tau_B \qquad (58)$$

$$s_f > s_r > s_B > s_R \qquad (59)$$

$$dk_f > dk_B > dk_r > dk_R \qquad (60)$$

$$u_B > u_f > u_R > u_r \qquad (61)$$

$$Rent_r > Rent_R > Rent_f \; (= Rent_B = 0) \qquad (62)$$

The above result gives us the following intuitive conclusions:

(1) When the political leader values holding office and there is political competitiveness (revealed in terms of political uncertainty), the citizen is better off. Especially, when the leader is benevolent and does not appropriate any endogenous rent.

(2) However, in the modern world a benevolent leader, who values his public duties very high and does not appropriate rent, is generally not available for a long duration. Hence, in the reality the voter is best off in the absence of any rent for the office-holder. This is possible with full information.

(3) With poverty prevailing widespread, since the availability of consumption goods and their allocation signals competence, the political system delivers it.

(4) In a developing country setting, with financial constraints (like in India), it is more "rational" behavior rather than "partisan" behavior that governs the policy decisions.

(5) The incumbent leader is voted out more by anti-incumbency factor / considerations than by the strength of opponent, drawn here from the stochastic structure. The retrospective voter votes against the incumbent political leader if no effort is made by her for augmenting the household consumption deficit.

Asymmetric information gives rise to the political rents and accentuates the skewness in the allocation of funds toward public consumption goods. The political leader has an incentive to bias the allocation favoring consumption goods. This bias in allocation is further

accentuated if the level of per capita income is especially low or percentage of people living with poverty is especially high. The discount rate is another important factor. Amidst poverty, poor people strongly discount future income. In such a case, the government responds to the popular demand for consumption income by increasing employment opportunities. In cases of drought or other sources of negative external shocks the bias towards consumption and away from long-term capital investment will be especially strong.

Chapter 5

Empirical Evidence, Analysis and Findings

5.1 Infrastructure Development and Growth

Quality Infrastructure and public services are essential ingredients to ensure economic growth. The World Bank President, Dr. James D. Wolfensohn in his 1998 address to the World Bank – IMF Annual Meetings emphasized

> Experience world wide indicates that poverty reduction and sustainable development require sound macroeconomic policies, open trade relations, and increases in human and physical capital. But sustainable development also requires a comprehensive framework that includes (1) good governance; (2) sound legal, incentive and regulating frameworks that protect property rights, enforce contracts, and stimulate competitive markets; (3) a sound financial sector, adequately regulated and supervised with a basis in internationally accepted accounting and auditing standards; (4) health, education, and social services that reach the poor, women , and girls effectively; (5) quality infrastructure and public services to promote rural development and livable cities; and (6) policies to promote environmental and human sustainability.[16]

Better infrastructure (whether in the public or the private domain), when provided, accelerates economic growth. Datt and Ravallion (1996), e.g., found that those states in India that were better placed in terms of infrastructure could achieve greater long run consumption

[16] World Bank (2000): p1.

growth and economic development. With no clear trade-off existing between growth and redistribution, infrastructure development can also be a means of achieving greater equity. Worldwide experience shows that the state is largely responsible for providing physical infrastructure, and especially so in developing countries.

5.2 Scope of Present Research

Widespread poverty and unemployment require the government to provide jobs to the poor, who are not only illiterate and unskilled but also extremely numerous. For this, public works projects (especially road and irrigation projects) are the avenue resorted to by the State in India. But adequate allocation of funds is necessary to complete the work. And even after a roadwork or an irrigation project is constructed, further financial resources are needed for its upkeep and maintenance. In the face of uncertainty regarding funding, quality tends to suffer. The scope of the present research focuses on infrastructure development in the form of road works and irrigation projects, because it is in such infrastructure projects that employment opportunities can be increased for unskilled workers.

5.2.1 Plan Funds in State Budget

The budgetary resources of state governments of India are broadly divided into Plan and Non-Plan funds. Plan funds are generally for the new and ongoing development activities /

projects. Non-plan funds are meant for day-to-day government expenditure like regulatory, police, judiciary and other sovereign state functions.

Within the plan funds, the state government earmarks financial allocations for different sectoral activities such as for agriculture, energy, irrigation, and education. We confine our attention to allocations from state plan funds for the irrigation projects and road works. This is because in the construction / maintenance of such projects large scale employment opportunities are generated for the unskilled labor. We can further categorize a particular year's allocations in two components. The first part is such where a large amount of such budgetary allocations is spent in providing wage employment to unskilled laborers. In these works, creating employment opportunities is accorded priority, especially notwithstanding whether the project would be completed or not. The other is the one where the objective of project completion is resorted to notwithstanding the resulting opportunities for employment generated in the process. It is the first part where projects are least likely to be completed. This is because an infrastructure development project necessitates funds in an appropriate mix (of material and labor components) instead of only material or only wage labor. This leaves the project unfinished and affects the quality content of the infrastructure. The latter part provides little in the way of employment opportunities, especially for unskilled labor.

5.2.2 Optimizing Solution

Optimization by the political leader under asymmetric information (4.9.3) yielded the following solution for government-provided consumption good to the citizen.

$$g_R = [(h_1 \frac{\bar{y}}{y} + h_2 P) \beta a + m] (1 - r) / b c + n r / b c \qquad (41)$$

$$\text{i.e.,} \quad g_R = [m(1-r) + n r] / b c + h_1 (1 - r) \beta a / b c (\frac{\bar{y}}{y}) + h_2 (1 - r) \beta a / b c (P) \qquad (63)$$

This can be simply written as

$$g_R = \gamma_0 \text{ (Constant term)} + \gamma_1 (\frac{\bar{y}}{y}) + \gamma_2 (P) + u_t \qquad (64)$$

where u_t is the standard error tem.

5.3 Data

The Indian Union consists of twenty eight States and seven Union Territories. Data for all the states are not easily available, especially for the smaller ones. However, data pertaining to fourteen major states, namely Andhra pradesh (AP), Assam, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh (MP), Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu (TN), Uttar pradesh (UP) and West Bengal (WB), were collected and form part of the empirical evidence. The data pertaining to Bihar, MP and UP include the same for the newly (in year 2000) carved out states of Jharkhand, Chhatisgarh and Uttaranchal, respectively. These fourteen states account for more than 90% of India's population and GDP. Annual State Plan documents are the major sources of the data collected.

5.3.1 Road Sector

India's road network is the second largest in the world. It consists of the following categories of roads.

Table 5.1: **ROAD NETWORK IN INDIA (2001)**

Sl. No.	Road Category	Road Length (in Miles)	Share of Road Length	Share of Traffic Load
1	National Highways	36,320	1.70%	40%
2.1	State Highways	77,688	3.64%	40%
2.2	Major District Roads	178,689	8.36%	
3	Rural Roads (Other District Roads and Village Roads)	1,843,774	86.30%	20%
	Total:	2,136,471	100%	100%

Thus, National Highways (NHs), accounting for only 1.7% road length, carry 40% of the road traffic. Similarly, State Highways (SHs) and Major District Roads (MDRs) with 12% of the road length carry another 40% of the traffic load. Although most of the NHs, SHs, and MDRs are black-topped, few rural roads are paved.

The rural road network has two important deficiencies. First, about 40% of the villages are yet to be connected by all-weather roads to nearby main markets. During the monsoon season this cuts many villages off from the outside making them islands for part of the year. A World Bank study(2003) estimates that "20-30% of the agricultural, horticultural and forest produce is wasted due to the lack of roads to carry the produce to markets and

processing centers." Second, poor maintenance results in severe deterioration and often renders these non-trafficable. The World Bank study(2003) states that "the quality of construction and maintenance work is generally poor, resulting in overall low service lives for the roads." Thus, low quality connectivity is accorded priority in rural areas. India's tenth plan document notes:

> A study by the World Bank showed that US $45 billion equivalent invested in main roads in 85 countries has been eroded over last 20 years through lack of maintenance. This would have been averted by preventive maintenance at a cost of less than US $12 billion.[17]

In a typical roadwork, the construction sequence consists of earthwork and its compaction; consolidating it with tiny and small stone pieces; and then at the end topping it with bitumen. At the start, it requires, largely unskilled labor input. In the Indian context digging earth and carrying it (especially small distances) and breaking big stones into small pieces is usually done by the unskilled labor. Bitumen constitutes the major material cost along with the expenses on equipment like road rollers, paver machines etc. Yet, this comes mostly in the completion stage of the road construction process. A typical road construction work, if not bitumen-covered, involves an expenditure of which approximately 80% is unskilled labor. Since rural roads are generally not black-topped, these provide good avenues for employment generation. Note that the quality of public good (road here) made available is not only poor but also deteriorates rapidly without adequate protection and consolidation by way of bitumen cover. This leaves 85% of the road network very poorly constructed and

[17] India, Government of; Planning Commission (2003): p. 951.

maintained. Most of the funds allocated for rural roads are expected to cater to the employment needs of poor households. While working in India at the district and sub-district levels, I have even observed that during droughts the road works provide the maximum labor engagement. This is because there being no connectivity to 40% of the villages, works can be taken up almost every corner of the State. Most of the time it is only the earth work that is done, which is primarily intensive in unskilled labor. Keeping in view the above situation, funds spent on rural roads are taken as a proxy for funds spent on incomplete road works. It mostly goes for rural employment to meet the immediate consumption needs of the poor. This data has been compiled from the Annual State Plan documents of each year from 1979-1980[18] onwards.

5.3.2 Irrigation Sector

Irrigation projects are divided into three categories; major irrigation projects that provide irrigation for Culturable Command area (CCA) of 10,000 hectares (Ha) and more; medium projects designed for more than 2000 Ha but less than 10,000 Ha of land; and minor irrigation projects, catering to CCA of 2000 Ha or less. Irrigation is a very vital input for agriculture and especially in India where the rainfall pattern is very erratic. The temporal dispersion of rainfall renders it undependable for modern intensive agricultural practices. The desert portions of western India receive only 4 inches of rainfall in about 5 days in a year, whereas the heaviest rainfall (a world record) is 440 inches in 15 days in parts of north-eastern India. The latter region is called the wet desert, being unsuitable for agriculture. The

[18] Note that Indian fiscal runs from April to March.

average rainfall for the entire country is 1170mm (47 inches), taking place in about 15 rainy days and less than 100 hours altogether in a year. (Source: Tenth Five Year Plan 2002-07, Planning Commission, Government of India)

The allocation of irrigation funds for minor irrigation projects has varied over time as shown in Table 5.2.

Table 5.2: **Allocation for Minor Irrigation Projects**

Period	Percentage of Irrigation funds in Minor Irrigation Projects.
1980-85	36.11%
1985-90	40.72%
1990-92	45.87%
1992-97	37.52%

Source: Report of the National Commission for Integrated Water Resources Development (1999), Ministry of Water Resources, Government of India

The National Commisssion for Integrated Water Resources Development in its report (1999) has observed:

> Funds do not seem to be a problem so far as minor irrigation works are concerned. Questions have been raised about the longevity of the schemes and their viability. There is also the doubt that the same schemes are being done over again, once in a few years.[19]

[19] Report of the National Commission for Integrated Water Resources Development (1999), Ministry of Water Resources, Government of India, New Delhi, p. 245.

Similar is also the situation pertaining to flood control and command area development works, which together account for less than 5% of the funds allocated to irrigation.

Major and medium irrigation projects are generally built across rivers. This involves major concrete works (involving large quantity of cement, iron and other materials) a high skill content in construction labor and heavy equipment and machinery. The proportion involving employment of unskilled labor is correspondingly very small. By contrast, the minor irrigation works are based on local water resources. These include such activities as deepening village ponds, constructing a small height (upto 4 or 5 feet only) water conserving earthen wall near a catchment in close proximity to a watershed, rain water harvesting and storage structures are typical minor irrigation works. These necessitate large quantities of unskilled labor input but little else. Hence, funds allocated to these activities largely go for employment generation. The geographic dispersion of the minor irrigation works makes it an appropriate choice in this regard. Thus the position pertaining to rural roads in case of road sector is reflected in the case of minor irrigation projects, flood control measaures and command area development works.

As seen from Table 4.2 above, the allocations of irrigation funds for minor irrigation projects are relatively high and have risen over time at least until the mid-1990s. Very often, the state governments resort to institutional financing to augment the pool of funds / budgetary allocations available for minor irrigation works so as to provide for the consumption needs of poor households. The lack of adequate funding results in the failure to line water channels. Such channels consequently are of inferior quality. The high level of water

percolation and dissipation from these channels greatly limits their irrigation potential. The life time of such projects is also limited by the resulting poor quality of such projects.

Thus, of the amount spent on minor irrigation projects, flood control measures and command area development works, a large share goes to employment generation for unskilled labor. But, the resulting public assets are of poor quality. We take expenditure on these irrgation sub-sectors (mostly on incomplete assets) as the ones largely meeting the needs of employment for the poor.

5.4 Equation for Regression

We have the model given by the following equation:

$$\begin{aligned} ICT = {} & \gamma_0 + \gamma_1 (GDPF) + \gamma_2 (BPLR) \\ & + \gamma_3 (PRJE) + \gamma_4 (EAPF) \\ & + \gamma_5 (LITR) + \gamma_6 (SCTR) + u_t. \end{aligned} \quad (65)$$

where ICT = Ratio of expenditure on incomplete road works and irrigation projects (contributing largely to rural employment generation) to total expenditure in both these sectors (equal to g_R),

GDPF = State GDP per capita differential (= $\frac{\bar{y}}{y}$), indicating relative deprivation of a state,

BPLR = Ratio of the population in a state living below poverty line,

PRJE = Total state plan expenditure on roads and irrigation projects as a ratio of state GDP,

EAPF = Expenditure on externally assisted projects in a state as a proportion to state GDP,

LITR = Literacy rate of the state, and

SCTR = Ratio of population belonging to SCs and STs in the state.

γ_0 is the constant term, other γ s are the respective coefficients and u_t is the error term.

The above equation takes the state government's expenditure on such roads and irrigation projects (ICT) wherein a large part goes to rural employment generation as the dependent variable. To increase the explanatory power of the empirical testing, other variables are also incorporated. These further enrich the model and give us a rich insight into the functioning of the model and conclusive evidence regarding the theoretical construct behind it.

5.5 Dependent Variable:

ICT – Ratio of Amount spent mostly for providing Unskilled Employment to Total Funds allocated for Roads and Irrigation sectors

The data pertaining to road works and irrigation projects have been collated from the concerned state annual plan documents. The dependent variable, ICT, thus is the ratio of amount spent on rural roads, minor irrigation projects, flood control measures and command area development works out of the total state plan funds alloted in both these sectors, i.e., roads and irrigation. This is the amount which creates employment opportunities for poor unskilled labor. Since quality is generally lost sight of in such projects, the higher is this ratio, the poorer infrastructure quality would be. Thus, the variable ICT is equivalent to a quality measure of infrastructure development, especially in the road sector and irrigation projects.

5.6 Independent Variables

5.6.1 GDPF – GDP Factor

GDPF is an exogenous variable indicating the income differential of a particular state with regard to the state having highest per capita GDP in that year.

$$\text{GDPF} = \frac{\bar{y}}{y}$$

Where the numerator is the GDP per capita of the state with highest value amongst the 14 major states of India and the denominator is the same for the concerned state.

These figures are based on 1993-94 prices and are available in the website of the Ministry of Statistics and Program Implementation, Government of India. GDPF is a measure of relative deprivation within the states. An increase in GDP per capita of a state would lower the GDPF of that state. Hence, any increase of GDP per capita and ensuing economic development in the state economy is by itself an improvement in the employment opportunities in that state. Hence, the demand for government to provide employment would be reduced. Thus the model forecasts that with GDP per capita of the state decreasing, GDPF would rise and ICT would rise. Therefore, the relationship between GDPF and ICT should be positive.

5.6.2 BPLR – Below Poverty Line Ratio

BPLR indicates the percentage of population living below poverty line (which is equivalent to about US $1 per day per person.). Poverty head counts have been done in the National Sample Survey in India in 1977-78, 1983-84, 1987-88, 1993-94, and 1999-2000. The BPLRs for intervening years have been calculated on the basis of rates worked out in these survey data, available from the Planning Commission of India's website. An increase in BPLR indicates an increase in the percentage of poor in that state. As poverty becomes more widespread, the demand for employment generation would also move up. Thus, there is a direct positive relationship between BPLR and ICT.

5.6.3 EAPF – Externally Assisted Projects (EAPs) Factor

The role of external assistance in the economic growth in developing countries has received much attention. At the local level, one of the effects of increased external assistance is that it adds to the qualitative dimension of infrastructure projects. As such, it should increase employment opportunities for local citizens. All Indian states attempt to obtain bilateral and multilateral foreign assistance (either grant or loan) for development projects. Therefore we include the following variable.

EAPF (Factor regarding Externally Assisted Projects - EAP) =

Expenditure on EAPs / State GDP.

This factor has been calculated as the ratio of Expenditure on EAPs to state GDP. This data was collected through personal efforts from within the Ministry of Finance, Department of Expenditure (State Plans Division), Government of India. An increase in EAPF should increase employment opportunities in the state economy. To that extent, the pressure on state government for generating employment opportunities for unskilled labor on the state apparatus should be reduced. Thus, the coefficient associated with EAPF should be expected to have a negative sign.

5.6.4 PRJE – Ratio of Project Expenditue to State GDP

The state governments in India earmark funds for the state roads and irrigation projects out of the state plan. A large allocation to these sectors would certainly help any state government to face the need for employment generation in that state. This can happen either with an increase of the size of the plan or with a larger share being earmarked for these activities. Either way, the impact can be assessed by including the following variable:

PRJE (Project expenditure) = Total Expenditure on roads and Irrigation / State GDP.

PRJE is the ratio of total state plan expenditure on road works and irrigation projects to state GDP. A higher allocation to these activities gets translated as a higher PRJE. Obviously, with larger amount made available there would be a corresponding decrease in the amount spent towards employment generation because a larger amount is likely to be spent to complete the projects. This implies a negative association of PRJE with ICT.

5.6.5 LITR – Literacy Rate

Human resource development has been recognized as an essential input for economic growth. Basic education is considered as the most important factor. We take into account the literacy rate (LITR) prevailing in each state and empirically test its influence on ICT.

Decadal literacy rates are available based on census data collected every ten years in India. Thus we have the data for 1981, 1991 and 2001. The growth rate has been computed and used to interpolate the data points for the intervening years. A literate person is more aware of democratic rights and the value of the vote that she casts. Thus, an increase in literacy frees the citizen from the traditional structure and its imperatives and consequently allows the ciitizen to exert more pressure on the political executive. This then should be reflected in a higher allocation for employment generation, resulting in an increase in ICT. Thus, there ought to be a positive relationship between LITR and ICT.

In the regression, however, we find that the literacy ratio does not have a significant relationship with ICT, until we take out the outliers. It has the coefficient sign in the anticipated direction, even when we regress at the first instance. Without the outliers we find very significant positive relationship in the literacy rate and the amount spent by the state government for creating employment opportunities for the poor households. However, with increased literacy, the rational voter may also not expect the political decision-making to be tilted as much. This is because the long run consequences of a disproportionately large expenditure (a very high ICT) for employment generation does not augur very well for the economy.

5.6.6 SCTR – Scheduled Castes and Tribes Ratio

India is a highly startified society, in terms social antecedents like caste, ethnicity, and language. Backward classes of Indian society have been specifically identified and

scheduled in the Indian constitution. The 'Directive Principles of State Policy' (DPSP) in the Constitution of India enjoins the government to take special measures to ameliorate the socio-economic backwardness of such scheduled sections of the society. Undoubtedly, a SC / ST person is more likely to face poverty. National surveys have established that there is a higher incidence of poverty in these groups, as evident from the following Table 5.3.

Table 5.3 **Poverty among SCs / STs (1993-94)**

Category	In Rural Areas	In Urban Areas
SCs	48.32 %	49.84 %
STs	51.96 %	40.74 %
Others	31.43 %	29.44 %
Total	37.23 %	32.28 %

We take the percentage of population belonging to SCs and STs (SCTR – Scheduled Caste and Tribe Ratio) as an independent variable and test its predictive ability. We find that after removing the unusual observations (14 data points) the proportion belonging to the very marginalized sections of the society is statistically significant. Hence we find on regression the result for SCTR being robust once regression is carried out without the outliers.

5.7 Regression Findings

We estimate the following equation.

$$\begin{aligned} ICT = {} & \gamma_0 + \gamma_1 (GDPF) + \gamma_2 (BPLR) \\ & + \gamma_3 (PRJE) + \gamma_4 (EAPF) \\ & + \gamma_5 (LITR) + \gamma_6 (SCTR) + u_t \end{aligned} \qquad (65)$$

5.7.1 With GDPF, BPLR and PRJE

First, we regress ICT on GDPF, BPLR, and PRJE. We obtain the following results.

```
. regress ict gdpf bplr prje
```

Source	SS	df	MS		
Model	1.06200762	3	.35400254	Number of obs	= 280
Residual	2.99975075	276	.010868662	F(3, 276)	= 32.57
				Prob > F	= 0.0000
				R-squared	= 0.2615
				Adj R-squared	= 0.2534
Total	4.06175837	279	.014558274	Root MSE	= .10425

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	.0312944	.0144291	2.17	0.031	.0028893	.0596994
bplr	.2250876	.0611931	3.68	0.000	.1046231	.3455521
prje	-10.63261	1.122801	-9.47	0.000	-12.84295	-8.422267
_cons	.3674828	.0232653	15.80	0.000	.3216829	.4132828

The above regression result tells us that all three independent variables included in this specification are significant, with R-squared being 26.15%. Moreover, the signs of the coefficients are as predicted by the model. The explanatory power of the theoretical model is therefore quite apparent.

5.7.2 With GDPF, BPLR, PRJE and EAPF

We extend the model partially by adding the EAPF as one of the independent variable to get the following regression output.

. regress ict gdpf bplr prje eapf

Source	SS	df	MS	Number of obs	=	280
				F(4, 275)	=	25.28
Model	1.09197234	4	.272993085	Prob > F	=	0.0000
Residual	2.96978603	275	.010799222	R-squared	=	0.2688
				Adj R-squared	=	0.2582
Total	4.06175837	279	.014558274	Root MSE	=	.10392

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	.0323242	.0143962	2.25	0.026	.0039834	.060665
bplr	.2069252	.0619642	3.34	0.001	.0849408	.3289095
prje	-10.24076	1.143663	-8.95	0.000	-12.49221	-7.989313
eapf	-3.843311	2.30726	-1.67	0.097	-8.385448	.6988263
_cons	.3788876	.0241804	15.67	0.000	.3312854	.4264897

This increases the explanatory power of the model to some extent. But, at the same time, the EAPF variable does not appear to be very significant. However, sign of its coefficient is as expected in the model.

5.7.3 With GDPF, BPLR, PRJE, EAPF and LITR

We add the Literacy rate (LITR) and regress to get the following:

. regress ict gdpf bplr prje eapf litr

Source	SS	df	MS	Number of obs =	280
				F(5, 274) =	20.42
Model	1.10274676	5	.220549351	Prob > F =	0.0000
Residual	2.95901162	274	.010799312	R-squared =	0.2715
				Adj R-squared =	0.2582
Total	4.06175837	279	.014558274	Root MSE =	.10392

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	.0353261	.0147066	2.40	0.017	.0063738	.0642785
bplr	.2204873	.0634346	3.48	0.001	.0956062	.3453685
prje	-9.784046	1.231684	-7.94	0.000	-12.20881	-7.35928
eapf	-4.403682	2.374497	-1.85	0.065	-9.078259	.2708945
litr	.0540263	.0540887	1.00	0.319	-.0524559	.1605085
_cons	.3371517	.0482764	6.98	0.000	.2421119	.4321914

This further increases the explanatory power of the model and increases the significance of the GDPF and EAPF variables. However, the literacy rate has the appropriate sign, it continues to be statistically insignificant.

5.7.4 With GDPF, BPLR, PRJE, EAPF, LITR and SCTR

We now include all the independent variables as per the equation (65) and carry out the regression. The results obtained are:

. regress ict gdpf bplr prje eapf litr sctr

Source	SS	df	MS	Number of obs	=	280
				F(6, 273)	=	17.45
Model	1.12599953	6	.187666589	Prob > F	=	0.0000
Residual	2.93575884	273	.010753695	R-squared	=	0.2772
				Adj R-squared	=	0.2613
Total	4.06175837	279	.014558274	Root MSE	=	.1037

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	.0362089	.0146878	2.47	0.014	.0072931	.0651246
bplr	.2157829	.0633813	3.40	0.001	.0910047	.3405611
prje	-9.653562	1.232279	-7.83	0.000	-12.07954	-7.227585
eapf	-5.576426	2.500094	-2.23	0.027	-10.49834	-.6545128
litr	.0918751	.0597974	1.54	0.126	-.0258476	.2095977
sctr	.1513425	.1029206	1.47	0.143	-.0512764	.3539614
_cons	.283283	.0605208	4.68	0.000	.1641362	.4024299

The four variables, GDPF, BPLR, PRJE, and EAPF turn out to have coefficients with the appropriate signs and are statistically significant.. Both the literacy rate and the SCs and STs ratio still are not significant at 5% level. Note that their significance is at 15% level. In an economy with widespread poverty, the greatest impacts are those of GDPF and BPLR. The appropriate coefficient signs attached to these parameters at the same time attest the efficiency of the theoretical construct in this case.

5.7.5 Impact of Liberalization

Indian economy has undergone substantial structural changes subsequent to the liberalization measures introduced in 1991. We introduce a time dummy to measure the impact of this and would expect its effect to be negative as with market operating the economy would provide employment opprtunities elsewhere, especially in the private sector. To that extent the dependence on government should go down. The result is as follows.

. regress ict gdpf bplr prje eapf litr sctr dper

Source	SS	df	MS	Number of obs	=	280
				F(7, 272)	=	14.92
Model	1.12706643	7	.16100949	Prob > F	=	0.0000
Residual	2.93469194	272	.010789309	R-squared	=	0.2775
				Adj R-squared	=	0.2589
Total	4.06175837	279	.014558274	Root MSE	=	.10387

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	.0396036	.018248	2.17	0.031	.0036784	.0755289
bplr	.2049887	.0721719	2.84	0.005	.0629021	.3470753
prje	-9.725728	1.255471	-7.75	0.000	-12.1974	-7.254053
eapf	-5.279304	2.676554	-1.97	0.050	-10.5487	-.009908
litr	.1028036	.0692485	1.48	0.139	-.0335277	.2391348
sctr	.1609917	.1075607	1.50	0.136	-.0507656	.372749
dper	-.0064018	.0203582	-0.31	0.753	-.0464816	.0336779
_cons	.2762791	.0645832	4.28	0.000	.1491326	.4034255

Although the coefficient of DPER is negative, it is not statistically significant. This can be understood in the backdrop of the Indian economy, characterized by widespread poverty and

very low level of per capita income. In all likelihood, the effects of the liberalization measures have been for a very short period and not yet sufficiently pervasive and strong to bring out any appreciable change in the political economy.

5.7.6 Linear Regression Model Assumptions

The assumptions associated with the linear regression model (LRM) are tested as follows:

(1) Linearity of the Parameters:

Our regression model is based on the equation as follows:

$$\begin{aligned} ICT = {} & \gamma_0 + \gamma_1 (GDPF) + \gamma_2 (BPLR) \\ & + \gamma_3 (PRJE) + \gamma_4 (EAPF) \\ & + \gamma_5 (LITR) + \gamma_6 (SCTR) + u_t. \end{aligned} \quad (65)$$

As evident, all the parameters are linear, as detailed out in sections 5.5 and 5.6 above.

(2) Full Rank availability:

The linear independence of the independent variables is a necessary pre-condition for adopting LRM methods. We test for multi-collinearity of all the variables to get

the following result with Pearson coefficients. The results clearly show that there is no multi-collinearity, the Pearson coefficient values being less than 0.6. Thus the independence of the variables on which we regress is clearly established, meeting this pre-requisite.

Correlations: ICT, GDPF, BPLR, PRJE, EAPF, LITR, SCTR

	ICT	GDPF	BPLR	PRJE	EAPF	LITR
GDPF	0.138 0.021					
BPLR	0.121 0.044	0.576 0.000				
PRJE	-0.402 0.000	0.264 0.000	0.380 0.000			
EAPF	-0.192 0.001	-0.018 0.760	-0.108 0.070	0.150 0.012		
LITR	0.087 0.144	-0.424 0.000	-0.492 0.000	-0.455 0.000	0.172 0.004	
SCTR	-0.009 0.883	0.184 0.002	0.226 0.000	0.218 0.000	0.198 0.001	-0.442 0.000

Cell Contents: Pearson correlation
P-Value

(3) Properties of the Error Terms

The most important of all the assumptions pertain to the error terms. Zero conditional mean, i.e.,

$$E(u/x) = 0,$$

is the basic assumption. We examine the properties of the error term and get the following histogram:

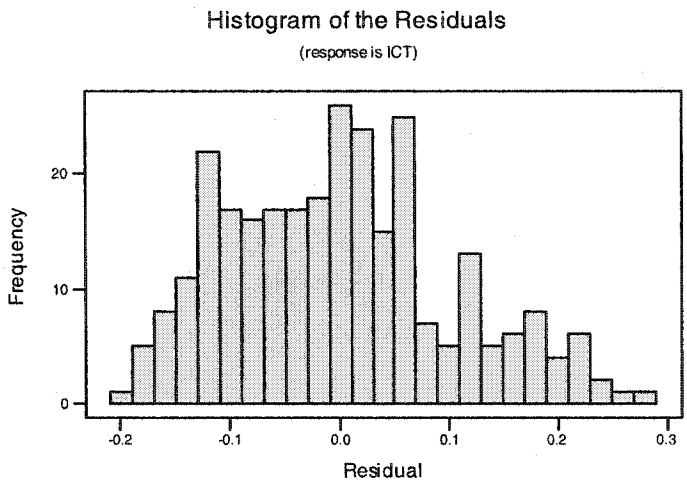

Figure 5.1 Histogram of the Residuals' Distribution

The histogram shows that the expected value of the error terms is close to zero. Normality assumptions are also supported with this. Thus, the assumptions with regard to the error term are met.

(4) Homoscedasticity

Homoscedasticity refers to the constant variance assumption, i.e., $var\,(u/x) = \sigma^2$. Figure 5.2 provides a graph of fitted values with the standardized residuals. The diagram clearly verifies the homoscedasticity requirement.

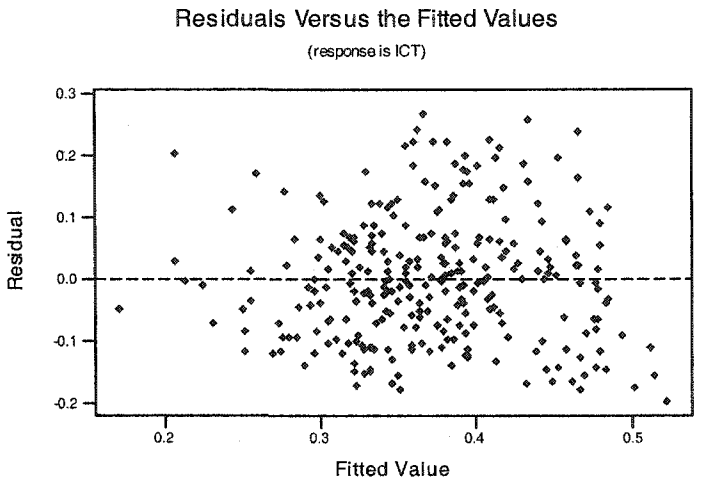

Figure 5.2 Distribution of Residuals vs. Fitted Values

However we find a few outliers. The unususal observations are the following:

Unusual Observations

Obs	GDPF	ICT	Fit	SE Fit	Residual	St Resid
13	1.77	0.43340	0.25992	0.02854	0.17348	1.74 X
14	1.70	0.41170	0.20638	0.03251	0.20532	2.09RX
21	2.02	0.59820	0.37354	0.01134	0.22466	2.18R
26	1.71	0.60670	0.36310	0.00873	0.24360	2.36R
27	1.73	0.57220	0.35509	0.01037	0.21711	2.10R
28	1.80	0.58490	0.36095	0.01033	0.22395	2.17R
31	1.85	0.62940	0.41581	0.00939	0.21359	2.07R
38	2.39	0.69480	0.43404	0.01385	0.26076	2.54R
178	2.37	0.26930	0.25595	0.03425	0.01335	0.14 X
198	1.01	0.60780	0.38255	0.01751	0.22525	2.20R
199	1.00	0.63800	0.36728	0.01765	0.27072	2.65R
252	2.17	0.44930	0.38126	0.02935	0.06804	0.68 X
259	2.24	0.63880	0.40906	0.01140	0.22974	2.23R
263	1.50	0.70680	0.46615	0.01847	0.24065	2.36R

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence.

Of the 280 observations, only 4 exert a large influence and 11 observations point to a large standardized residual. Thus there are only 14 unusual observations, well within normal acceptability.

(5) All the regressors and data pertaining to them are given independently and therefore meet the non-stochastic criterion.

Thus we conclude that the assumption characteristics of linear regression method for running OLS regression are sufficiently satisfied.

5.7.7 Regression without Outliers

We regress after taking out the 14 unusual observations listed above and get the result as follows:

ICT = 0.240 + 0.0320 GDPF + 0.251 BPLR - 9.22 PRJE - 7.18 EAPF + 0.122 LITR + 0.198 SCTR

Predictor	Coef	SE Coef	T	P
Constant	0.23963	0.05633	4.25	0.000
GDPF	0.03198	0.01344	2.38	0.018
BPLR	0.25123	0.05875	4.28	0.000
PRJE	-9.216	1.137	-8.11	0.000
EAPF	-7.184	2.673	-2.69	0.008
LITR	0.12200	0.05592	2.18	0.030
SCTR	0.19804	0.09595	2.06	0.040

S = 0.09351 R-Sq = 32.2% R-Sq(adj) = 30.7%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	6	1.07661	0.17943	20.52	0.000
Residual Error	259	2.26461	0.00874		
Total	265	3.34121			

Regression result with remaining 266 data points shows that all the independent variables are now statistically significant in the relationship with ICT. The signs are all as predicted by the theoretical model. Literacy rate and the ratio of population belonging to SCs / STs also are now significant as we analyzed earlier. Thus all the socio-economic variables have good explanatory capability and have significant statistical relationship with the amount the state government spends in creating employment opportunities for the unskilled poor.

5.8 Political Dimension

Political leader's utility function includes the representative citizen's utility function in addition to the endogenous rent and non-monetary political benefits. Yet, thus far in the empirical analysis the political dimension has been omitted. The purpose of this section is to rectify this by bringing in the impact of elections.

5.8.1 Impact of Election

The Election Commission of India (ECI) successfully restrains the incumbent political party from making public announcements, promises, taking new policy initiatives and indulging in ribbon-cutting exercises in the period preceding the election. Indeed, the 'Model Code of Conduct' is strictly enforced. Even the executive ability to transfer and repost government officials requires prior clearance from the ECI, for it to be legal once elections are announced. The disciplinary powers over the government functionaries during the election process vest solely with the ECI. Thus, free and fair elections are ensured both in letter and spirit. Given this policy regime, we take into account the year prior to the election year in which the incumbent government can make an impact on the public psyche with regard to competence signaling.

In the years between 1980 and 2000, there were 68 state elections (to state assemblies). The state of Uttar Pradesh had 6 elections. The states of Assam, Punjab and West Bengal had 4 elections each. The remaining 10 states had 5 elections each.

5.8.2 Findings as to Impact of Elections

5.8.2.1 With Dummy for Election-eve Year

We take the election-eve year as the dummy (DELE) and regress to evaluate impact of the elections on ICT. The regression results are as follows:

. regress ict gdpf bplr prje eapf litr sctr dele

Source	SS	df	MS		
Model	1.12667718	7	.160953883	Number of obs	= 280
Residual	2.93508119	272	.01079074	F(7, 272)	= 14.92
				Prob > F	= 0.0000
Total	4.06175837	279	.014558274	R-squared	= 0.2774
				Adj R-squared	= 0.2588
				Root MSE	= .10388

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	.0363158	.0147193	2.47	0.014	.0073376	.065294
bplr	.2156667	.063492	3.40	0.001	.0906684	.340665
prje	-9.660167	1.234681	-7.82	0.000	-12.09091	-7.229421
eapf	-5.578359	2.504408	-2.23	0.027	-10.50885	-.6478713
litr	.0918077	.0599009	1.53	0.127	-.0261206	.2097361
sctr	.1510055	.1031065	1.46	0.144	-.0519827	.3539937
dele	-.0038419	.0153309	-0.25	0.802	-.0340243	.0263405
_cons	.2841387	.060721	4.68	0.000	.1645958	.4036817

The coefficient of the election-eve year dummy has no significant impact.

5.8.2.2 With Dummy for Second year prior to Election

Regressing after inclusion of a Dummy for the second year prior to election (DELS) we get the following result:

. regress ict gdpf bplr prje eapf litr sctr dels

Source	SS	df	MS		
Model	1.12695911	7	.160994159	Number of obs	= 280
Residual	2.93479926	272	.010789703	F(7, 272)	= 14.92
				Prob > F	= 0.0000
Total	4.06175837	279	.014558274	R-squared	= 0.2775
				Adj R-squared	= 0.2589
				Root MSE	= .10387

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
gdpf	.036	.014729	2.44	0.015	.0070026	.0649974
bplr	.2170292	.0636247	3.41	0.001	.0917697	.3422887
prje	-9.685139	1.238873	-7.82	0.000	-12.12414	-7.246139
eapf	-5.49425	2.51939	-2.18	0.030	-10.45423	-.5342674
litr	.0901243	.0601845	1.50	0.135	-.0283622	.2086109
sctr	.1490466	.1033798	1.44	0.151	-.0544797	.3525729
dels	-.0046176	.0154838	-0.30	0.766	-.0351009	.0258658
_cons	.2857457	.0611819	4.67	0.000	.1652954	.406196

Clearly, the second year prior to election dummy also does not have any significant influence on ICT

5.8.2.3 With Dummy for Third year and both the years

Finally, we introduce dummies for the third year prior to election (DELT) and for both the second and third years put together (DELST). With these variables included the results are as follows.

. regress ict gdpf bplr prje eapf litr sctr delt

Source	SS	df	MS		
Model	1.13071561	7	.161530801	Number of obs	= 280
Residual	2.93104276	272	.010775893	F(7, 272)	= 14.99
				Prob > F	= 0.0000
Total	4.06175837	279	.014558274	R-squared	= 0.2784
				Adj R-squared	= 0.2598
				Root MSE	= .10381

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
gdpf	.0359059	.0147101	2.44	0.015	.0069458	.064866
bplr	.2174893	.0634991	3.43	0.001	.0924772	.3425015
prje	-9.657455	1.233564	-7.83	0.000	-12.086	-7.228908
eapf	-5.505827	2.504947	-2.20	0.029	-10.43737	-.5742785
litr	.0880121	.0601432	1.46	0.145	-.0303933	.2064175
sctr	.14675	.1032604	1.42	0.156	-.0565411	.3500412
delt	-.0103469	.0156403	-0.66	0.509	-.0411382	.0204445
_cons	.2881799	.0610338	4.72	0.000	.1680213	.4083385

. regress ict gdpf bplr prje eapf litr sctr delst

Source	SS	df	MS		
Model	1.13281099	7	.161830141	Number of obs	= 280
Residual	2.92894738	272	.010768189	F(7, 272)	= 15.03
				Prob > F	= 0.0000
Total	4.06175837	279	.014558274	R-squared	= 0.2789
				Adj R-squared	= 0.2603
				Root MSE	= .10377

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
gdpf	.0354441	.0147291	2.41	0.017	.0064465	.0644417
bplr	.220246	.0636717	3.46	0.001	.094894	.3455981
prje	-9.727615	1.236619	-7.87	0.000	-12.16218	-7.293053
eapf	-5.323725	2.521873	-2.11	0.036	-10.2886	-.3588536
litr	.0841512	.0606207	1.39	0.166	-.0351941	.2034965
sctr	.1416833	.1037035	1.37	0.173	-.0624804	.3458469
delst	-.0102643	.0129056	-0.80	0.427	-.0356719	.0151434
_cons	.293615	.0619392	4.74	0.000	.1716738	.4155561

In both the above sets of regression findings, these additional election year dummy variables have no significant impact on ICT.

5.8.2.4 Inference from Regression

Thus, we find no significant relationship between timing of elections and the expenditure that the state government incurs on generating employment opportunities for the unskilled poor households. This supports the retrospective voter hypothesis, where the voter takes into account the performance of the government in all the years when the incumbent government holds political office than in the election year alone. In all the above regression findings, even the R-squared value does not increase appreciably. Thus including dummies for election year impacts does not add to the explanatory power of the model, but shows the robustness of our prior results to change in specifications.

5.8.2.5 Khemani (2000): A Political Economy Study of India

(1) The Model

Khemani (2000) develops a model for the study of political cycles arising from elections in Indian states. Her results show no evidence of increased spending just before elections. She takes into account two components of policy manipulation; fiscal policy and public service delivery (in terms of road works).

The model consists of three periods: pre-election, election and post-election. The voter must vote in the election period and the total output is consumed in the post-election period. The politician's utility is given by

$$U_p = [\, x - c(e_1)] \;+\; \delta\, [\, x - c(e_2)\,] \;+\; \delta^2 x \;*\; Pr.\,(Reelection)$$

where x is the fixed rent that the politician gets every year in which she (he) holds office irrespective of the quantum of output,

$c(\,)$ is the cost of effort function, and

δ is the discount rate.

No effort is made in the third period, as the world ends thereafter.

Voters care about

$$y_t = \theta + e_t + \varepsilon_t$$

where y is the output variable,

θ is the incumbent politician's time-invariant competence,

e is the politician's effort, and

ε is the error term.

Production technology is linear and stochastic.

The career and reputation concerns of the politician give rise to a short-run political cycle wherein higher efforts are made by the politician just before the election period. Voter is retrospective, not myopic.

(2) Findings

Her study concludes as follows:

(a) Larger efforts in road construction (especially National Highways) are made just before elections. State roads and rural roads are not within the scope of the study. The increase in road construction is also statistically significant at the 10% level.

(b) The increases in fiscal effort are smaller in size than those on roads. She ascribes this to the increased level of effort of the political leader.

(c) There is no election-eve spending. Increase in investment spending is accompanied by a simultaneous decrease in consumption spending (like salaries, subsidies).

(d) The study finds no interaction effect of the local election with local conditions like literacy, poverty or inequality on highway construction.

(e) So far as fiscal policy is concerned, taxes are reduced on specific commodities, related to manufacturers and traders. There are no changes in taxes on items of mass consumption.

(f) The study notes the following contradictory observations between statutory mandated elections and mid-term elections.

Variable	**Scheduled Election**	**Midterm Election**
Taxes	Negative	Positive
Capital Spending	Positive	Negative
Current Spending	Negative	Positive

But the study offers no explanation for these contradictory findings.

(g) There is no significant difference across states.

(h) Political leaders discount the future heavily due to the uncertainty involved. The model does not provide reward for higher level of efforts from the politician, but does provide punishments in the form being voted out of office.

In another paper, Khemani (2001) finds that voters are myopic so far as national elections are concerned. Inflation and inequality are the issues involved in the national elections. However, the voter is more vigilant in state elections.

(3) Inference

The above study is relevant for us. It studies the state elections in India with a political economy model. We observe the following deficiencies in the findings of Khemani (2000).

(i) While studying the state elections, the study notes special efforts in respect of National Highways. Note that National highways in India are completely funded by the Government of India. It is only logical, therefore, that no impact on state budget would be seen. Instead, state roads and rural roads, which fall in the purview of state governments, are outside the scope of the study.

(ii) The decrease in consumption spending is not explained. Since this includes salaries and subsidies, which are seldom reduced, this finding seems hard to believe, except by way of postponement of liability on this account to later years. It has been often observed that around election period, no incumbent government would like to alter subsidies in a negative way. So this calls for more detailed study.

(iii) Although the effect of local conditions is found on effort to be insignificant, this is not surprising for the federal spending in local jurisdictions.

(iv) The reason why she got conflicting findings between scheduled elections and midterm elections was not explained.

(v) Although there is no signaling under asymmetric information, competence of the political leader drives the model. The assumption regarding the time-invariant character of the competence of the political leader is perhaps not very realistic.

(vi) The model does provide neither for non-monetary benefits nor a quality dimension in infrastructure spending.

(vii)The rationale for different findings as to voter's characteristics, myopic for national elections but not for local elections, calls for more in-depth analysis.

(4) Scope and Features of Present Study

The following improvements are incorporated in the present study.

(a) Study of Indian state elections are related to an area, for which the state government is responsible and vested with authority.

(b) Infrastructure quality is the subject of concern with regard to a developing economy. We relate socio-economic parameters to their impact on the quality of infrastructure developed. We find a robust relationship.

(c) The quantum of rent is not fixed. It varies with respect to how the political leader values office holding. The non-monetary benefits of holding political office count a lot. Our model includes these realistic assumptions.

(d) The model provides scope for signaling under asymmetric information with a stochastic competence term.

(e) The voter is characterized as being retrospective, evaluating the political leader's performance for all the intervening years of holding office between two elections.

(f) We also take into account indicators of human resource development like the literacy rate and the position of a group within the society, like SCs / STs in India. After removing the unusual data points, we find that these indicators also help explain the expenditure that the government incurs for generating employment opportunities for the poor while causing an adverse impact on infrastructure quality.

(g) The timing of election does not exercise any impact in the regression findings. This corroborates the findings of Khemani (2000), in the World Bank.

Thus, the theoretical model that we test receives strong empirical support unlike the above study.

5.8.3 Change of Incumbent Political Party and Its Impact

Further analysis is carried out to assess the significance especially where the incumbent political party in the state government lost out to the opponent in elections. Of 68 state elections held during the period 1980 to 2000, the incumbent political party was voted out in 41 of these elections, i.e., almost 60% of the time. We introduce a dummy for the change of government (DGOV) and get the following result by running the regression.

. regress ict gdpf bplr prje eapf litr sctr dgov

Source	SS	df	MS		
Model	1.1357334	7	.162247628	Number of obs =	280
Residual	2.92602498	272	.010757445	F(7, 272) =	15.08
				Prob > F =	0.0000
				R-squared =	0.2796
				Adj R-squared =	0.2611
Total	4.06175837	279	.014558274	Root MSE =	.10372

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	.0356715	.0147012	2.43	0.016	.0067288	.0646141
bplr	.2176261	.0634219	3.43	0.001	.0927658	.3424864
prje	-9.696855	1.233334	-7.86	0.000	-12.12495	-7.268762
eapf	-5.581404	2.500535	-2.23	0.026	-10.50427	-.6585416
litr	.0875064	.0599839	1.46	0.146	-.0305854	.2055981
sctr	.1520211	.102941	1.48	0.141	-.0506413	.3546835
dgov	.0183915	.0193343	0.95	0.342	-.0196725	.0564555
_cons	.2839989	.060536	4.69	0.000	.1648202	.4031777

Once again this clearly shows that there is no significant effect on ICT of a change of government. This can be also viewed in the light of our earlier findings of no-impact of the elections.

5.8.4 Analysis with Mean values of Parameters

5.8.4.1 Data with Election-eve year Values

We further carry out analysis using only the election year observations. Since of the 68 election years, 10 state elections were held in 1980, we have remaining 58 data-points. The regression findings are as given in the following result sheet. As can be seen, this reduces the Adjusted R-squared values from the original regression. Clearly the data for the year before the election does not yield any satisfactory result. Rather the only variable with a statistically significant effect on ICT is 'Project Expenditure' (PRJE).

. regress ict gdpf bplr prje eapf litr sctr

Source	SS	df	MS		
Model	.206018887	6	.034336481	Number of obs	= 58
Residual	.503391088	51	.009870413	F(6, 51)	= 3.48
				Prob > F	= 0.0059
Total	.709409974	57	.012445789	R-squared	= 0.2904
				Adj R-squared	= 0.2069
				Root MSE	= .09935

ict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
gdpf	-.0009955	.0317703	-0.03	0.975	-.064777	.062786
bplr	.2468221	.1409022	1.75	0.086	-.0360508	.529695
prje	-11.58908	2.878166	-4.03	0.000	-17.36724	-5.810922
eapf	.9474667	5.190476	0.18	0.856	-9.472849	11.36778
litr	.0089479	.1238938	0.07	0.943	-.2397792	.2576751
sctr	.0381769	.2138119	0.18	0.859	-.3910683	.4674221
_cons	.408577	.1276078	3.20	0.002	.1523938	.6647603

5.8.4.2 Data with Mean values of all previous years after last Election

As a further exercise in trying to integrate political variables, we instead of only information for election-eve year, take the average of the values of independent variables for all years between successive elections, with 68 observations available. The result is as follows:

. regress avict agdpf abplr aprje aeapf alitr asctr

Source	SS	df	MS		
Model	.279202705	6	.046533784	Number of obs	= 68
Residual	.505188506	61	.008281779	F(6, 61)	= 5.62
				Prob > F	= 0.0001
Total	.78439121	67	.011707331	R-squared	= 0.3559
				Adj R-squared	= 0.2926
				Root MSE	= .091

avict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
agdpf	.0278808	.0268144	1.04	0.303	-.0257378	.0814995
abplr	.2703116	.1104525	2.45	0.017	.0494482	.491175
aprje	-9.772296	2.224305	-4.39	0.000	-14.22007	-5.324523
aeapf	-8.342779	5.273966	-1.58	0.119	-18.88873	2.203168
alitr	.0496399	.1096191	0.45	0.652	-.169557	.2688369
asctr	.2468389	.1847993	1.34	0.187	-.1226901	.6163679
_cons	.2803897	.1068886	2.62	0.011	.0666528	.4941266

Once again this data for between election years does not show any satisfactory result. Only the variables of average Poverty Ratio (ABPLR) and Project Expenditure (APRJE) retain a statistically significant relationship. Neither it increases the explanatory power of the theretical model.

5.8.4.3 Based on Mean values of 3 years preceding Election

We regress the average values of 3 years preceding the election and obtain as follows:

. regress aict agdpf abplr aprje aeapf alitr asctr

Source	SS	df	MS		
Model	.19472759	6	.032454598	Number of obs	= 56
Residual	.407013478	49	.008306398	F(6, 49)	= 3.91
				Prob > F	= 0.0029
Total	.601741068	55	.010940747	R-squared	= 0.3236
				Adj R-squared	= 0.2408
				Root MSE	= .09114

aict	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
agdpf	.0229845	.030986	0.74	0.462	-.0392843	.0852533
abplr	.2572562	.138646	1.86	0.070	-.0213634	.5358758
aprje	-10.00205	2.710821	-3.69	0.001	-15.44965	-4.554451
aeapf	-4.616576	5.141617	-0.90	0.374	-14.94904	5.71589
alitr	.0697509	.1211462	0.58	0.567	-.1737015	.3132032
asctr	.0969568	.201728	0.48	0.633	-.3084307	.5023443
_cons	.3110612	.1176294	2.64	0.011	.0746761	.5474464

All the parameters fail to show any significant impact except 'Project Expenditure' (PRJE). Even the Adjusted R-squared value falls. Thus this confirms our earlier failure to detect any significant impact of state elections on the amount spent for employment opportunities to meet the consumption shortfalls of poor households. Even the average GDPF and average EAPF with significant relationship in our original regression, reveal insignificant impact. Even the findings for the literacy rate and the ratio of Scheduled Castes and Scheduled Tribes in total population are further reduced in terms of its P value.

5.8.5 Logit Analysis with Change of Government

One possible implication of our political economy model can also be that unless the minimum requirements of generating employment for the poor households are met, it might result in change of the incumbent political party in the government. To test this we treat the change of government as a binary dependent variable and evaluate the impact of 'Poverty Ratio' (BPLR) and ICT. We get the following results:

```
. logit  dgov ict bplr

Iteration 0:  log likelihood =  -101.53742
Iteration 1:  log likelihood =  -100.865
Iteration 2:  log likelihood =  -100.85892
Iteration 3:  log likelihood =  -100.85892

Logit estimates                           Number of obs   =        280
                                          LR chi2(2)      =       1.36
                                          Prob > chi2     =     0.5074
Log likelihood = -100.85892               Pseudo R2       =     0.0067

------------------------------------------------------------------------------
        dgov |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ict |    1.191138   1.504086     0.79   0.428    -1.756817    4.139092
        bplr |   -1.328545   1.422949    -0.93   0.350    -4.117475    1.460385
       _cons |   -1.990019    .750653    -2.65   0.008    -3.461272    -.518766
------------------------------------------------------------------------------
```

From the above result it is clear that neither the ICT nor BPLR has any significant impact on the change of the incumbent political party in the state government after the elections. This can be understood in the backdrop of our earlier finding wherein the election dummies did not indicate any significant impact in our model.

5.9 Data Analysis

Trend analysis of the data is carried out, next, to further evaluate and confirm the relationship between these variables. For this purpose, mean is worked out of each significant variable state-wise for two period intervals. The first pertains to the period 1980-1990 and the second 1991-1999, apart from one for the complete period. This is because Indian economy underwent wide ranging economic reforms and liberalization in 1991. This enables us to analyze graphically the relationship between different variables.

5.9.1 ICT ~ GDPF

Each state is represented by a point for a block period. We obtain the graphs for different block periods as under:

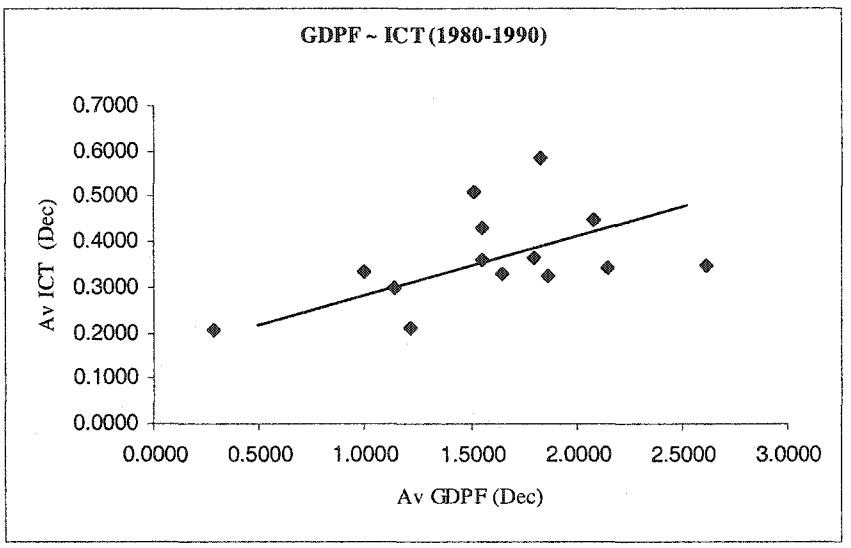

Figure 5.3 Average GDP Factor and ICT (1980 – 1990)

The graphs confirm the trend as expected. An increasing GDPF indicates a falling GDP per capita of the state. We also graph the relation for the whole period to get the following result.

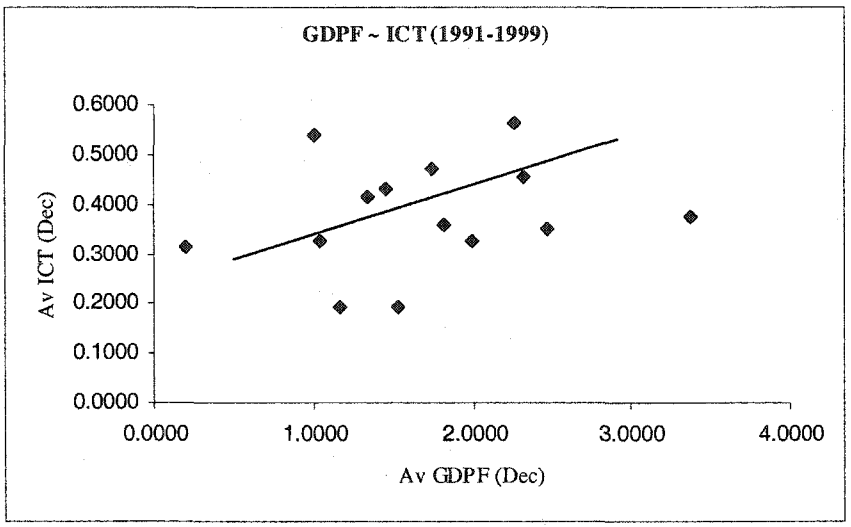

Figure 5.4 Average GDP Factor and ICT (1991 – 1999)

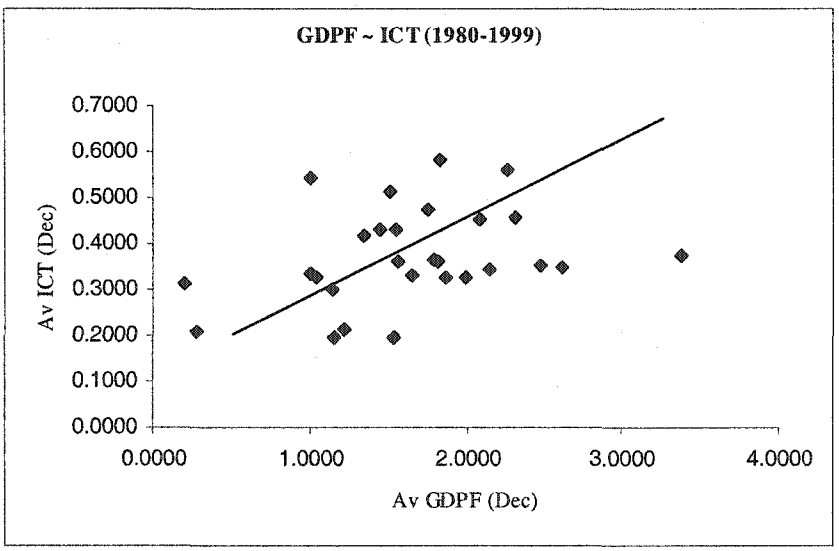

Figure.5.5 Average GDP Factor and ICT (1980 – 1999)

5.9.2 ICT ~ BPLR

By plotting the percentage of people living below poverty line (BPLR) and the amount spent for the projects largely on employment generation we get the graphs. The graphs shows clearly the trend in confirmity with the model. With more people living below poverty line, the state government will be incurring more expenditure on the incomplete projects and towards employment of the unskilled poor labor. To analyze the trend for the whole period we plot graph and get as follows:

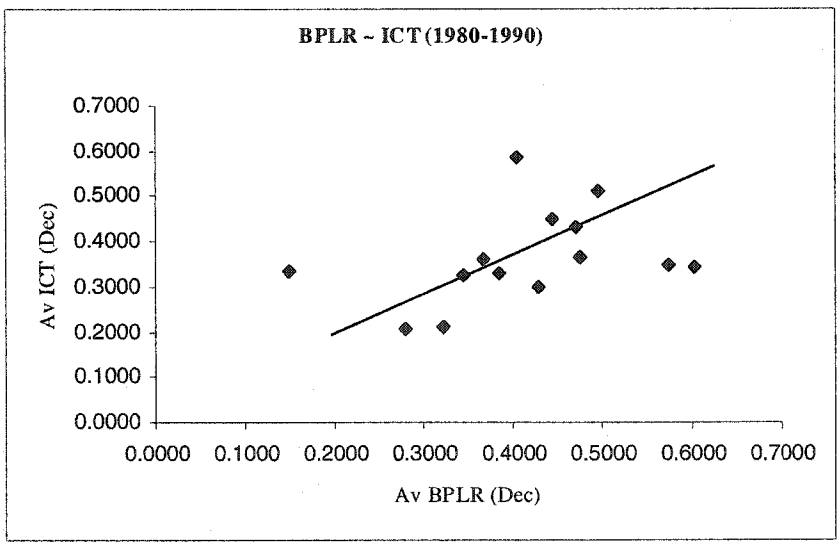

Figure 5.6 Below Poverty Line Ratio and ICT (1980-1990)

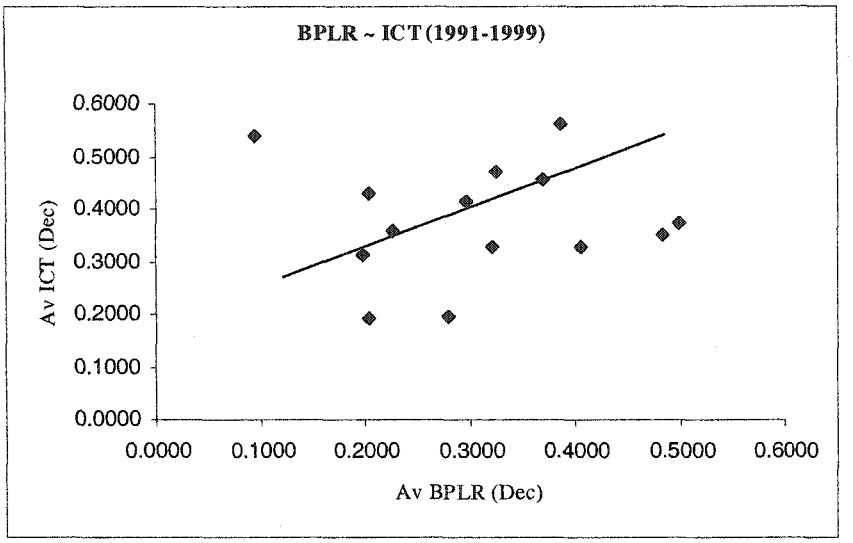

Figure 5.7 Below Poverty Line Ratio and ICT (1991-1999)

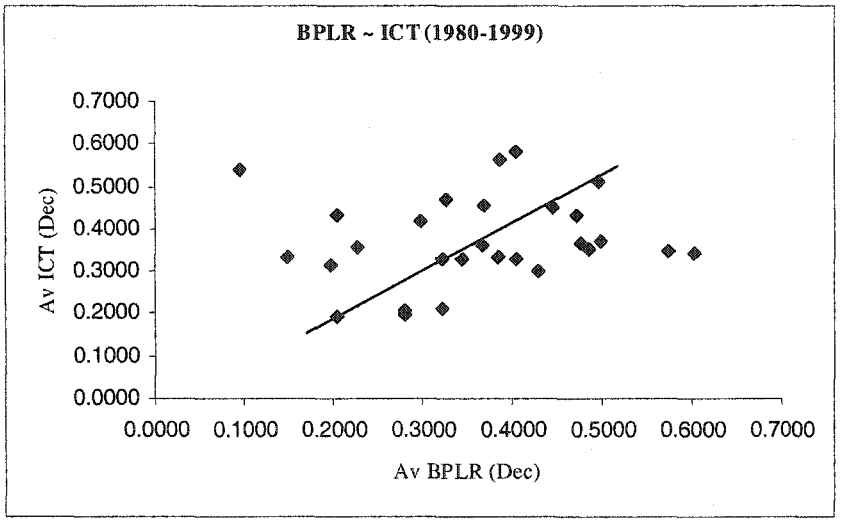

Figure 5.8 Below Poverty Line Ratio and ICT (1980-1999)

We see similar trend graphs. There is no change in different periods.This confirms our regression result that time factor is not statistically significant. Thus our findings of

regression, in accordance with the theoretical model, are confirmed by the above graphs for different periods and for the complete period.

5.9.3 ICT ~ External Assistance

The regression findings indicated improvement in the projects both quantitatively and qualitatively, with ICT falling with increase in external assistance.

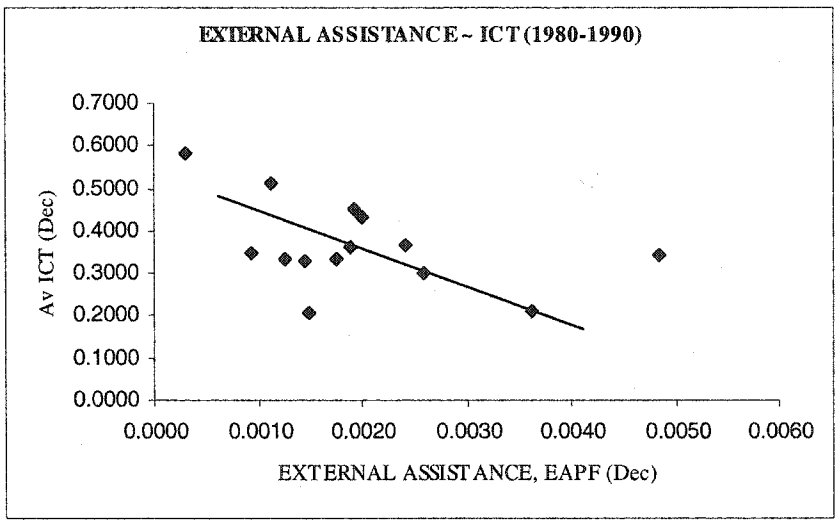

Figure 5.9 External Assistance to GDP and ICT (1980-1990)

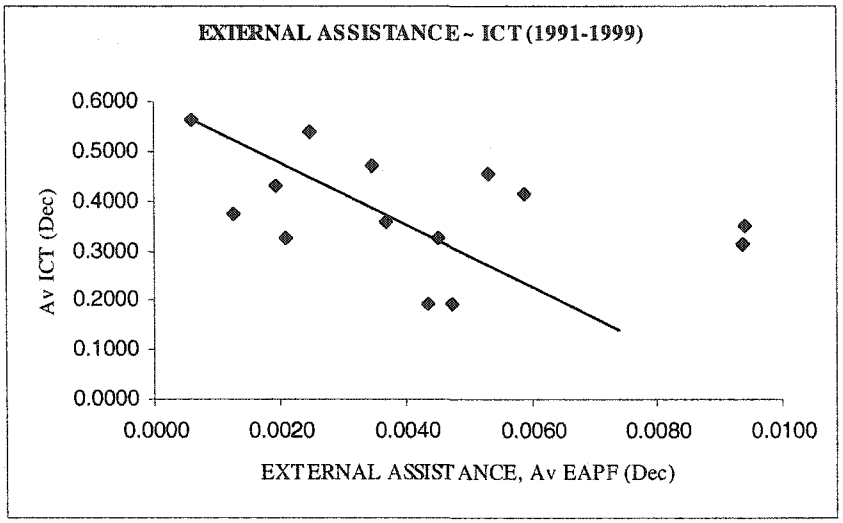

Figure 5.10 External Assistance to GDP and ICT (1991-1999)

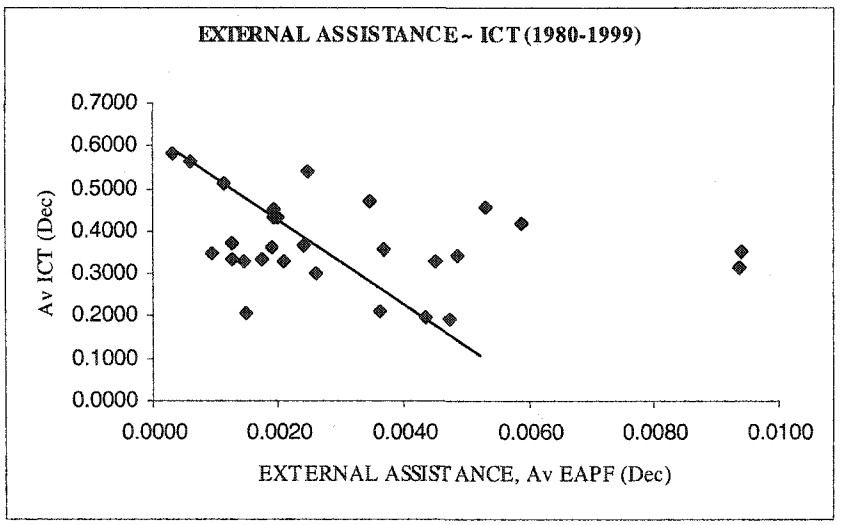

Figure 5.11 External Assistance to GDP and ICT (1980-1999)

The above graphs and the trend lines are in confimity with our theretical model and regression findings.

5.9.4 ICT ~ Project Expenditure

We have earlier analyzed the impact of increase of the total amount available for the road works and irrigation projects.The regression findings show a negative relationship between the quality content and project expenditure as a share to state GDP. The more is available for project expenditure, the less would be the requirement to spend on incomplete projects as a proportion. Consequently, more projects would be completed, contributing to long-run economic growth. We do a graph-based analysis of it and find that it confirms our predictions.

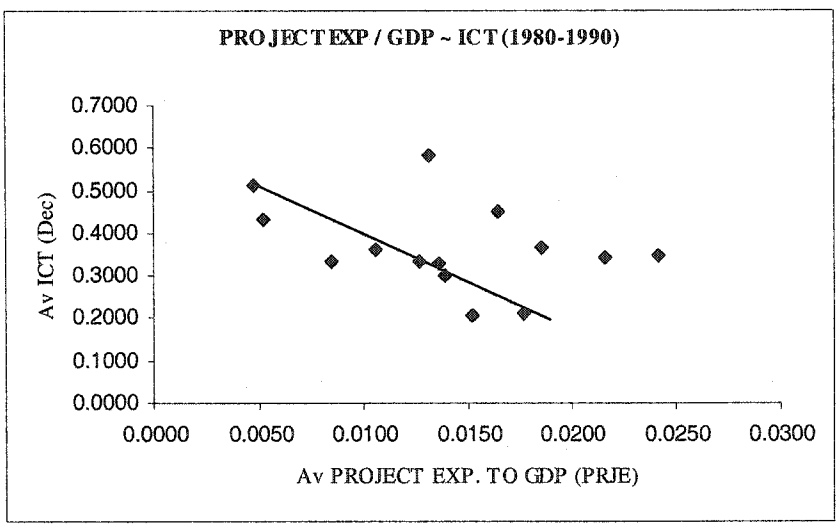

Figure 5.12 Project Expenditure to GDP and ICT (1980-1990)

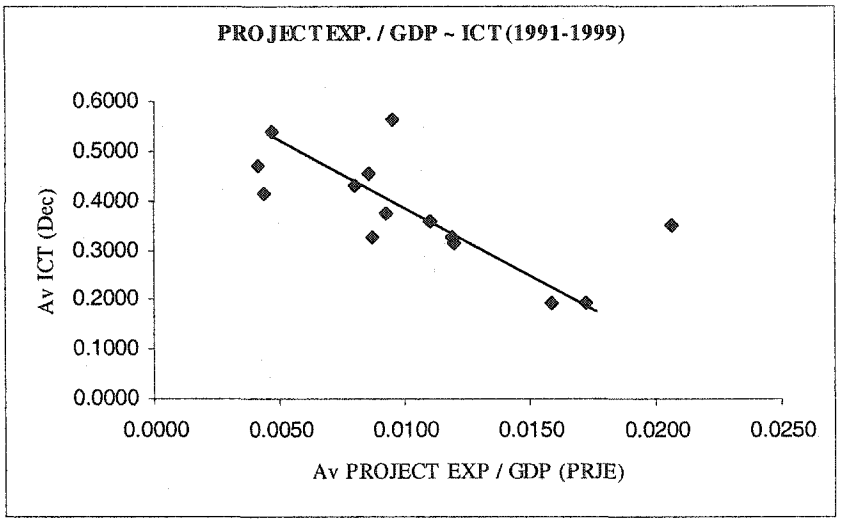

Figure 5.13 Project Expenditure to GDP and ICT (1991-1999)

The following is the graph for both the block periods:

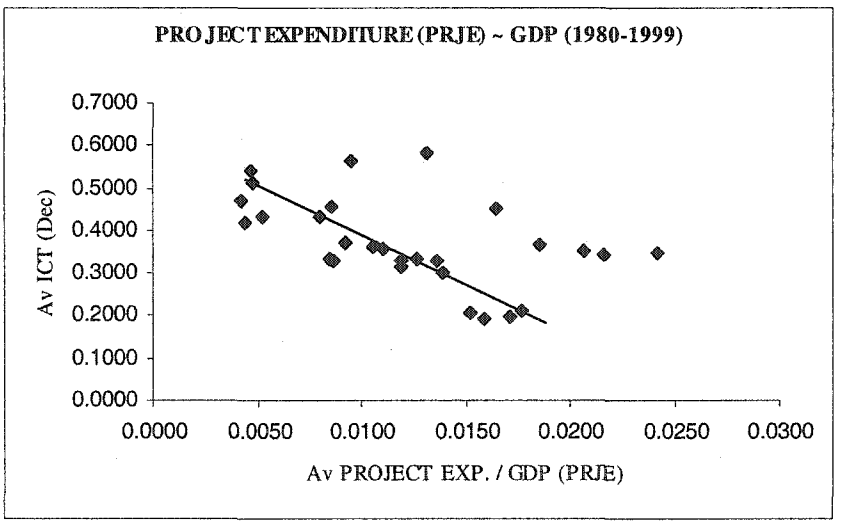

Figure 5.14 Project Expenditure to GDP and ICT (1980-1999)

5.10 Rural and Urban areas

Unlike in the developed countries, cities / towns in India mostly form a part of habitation continuum, except probably for the cities with population of a million and above. Urban agglomerations in developing countries and especially India can be characterized as follows:

(1) In India the poor people tend to live in the peripheral urban areas rather than in the city center, which is just opposite to the position in the western world.

(2) Depending upon employment opportunities, regular travel between the peripheral urban and nearby rural areas is quite common.

(3) The difference in incidence in poverty between rural and urban areas is also within a 10% or even smaller band limit.

(4) Except for large cities, most of the urban living spaces are spatially quite congested. The rural areas nearby are within a few kilometers of the city center in such towns. As a result, both the urban and rural poor seek employment opportunities either within the town or in the nearby rural areas. Both are often faced with the shortfalls in the immediate consumption needs of their households.

The above features emphasize that it is the poor whose fragile position contributes most strongly to our understanding of the incomplete projects phenomenon.

Chapter 6

Conclusion

6.1 Explanatory Power of the Model

Regression results show that the variation in GDP factor (relative deprivation within the country) and changes in the BPL ratio significantly affect ICT in the right direction. With the increase in sectoral allocations (PRJE) there is a negative change in ICT as expected by the fundamentals of the theoretical proposition. With larger amount of funds available from externally assisted projects the ICT goes down indicating a relaxation of pressure on the home resources for providing means of livelihood to poor.

Neither the literacy rate nor the proportion of SC / ST population have statistically significant effects. Of course, these variables have the coefficients with the right sign. Overall we have very good explanatory power associated with the model in terms the empirical evidence and the regression findings.

6.2 Political Dimension

6.2.1 Impact of Election

Our findings point to absence of any significant impact of the timing of elections. The retrospective voter, of course, takes into account the previous performance of the incumbent government during all the years when she votes. The political dimension is captured by incorporating the utility of the citizenry within that of the leader. With pervasive and widespread poverty, the consumption needs of the poor households (who count in large numbers and hence are politically important) has to be catered to by the government almost on a regular basis. This probably leaves little else to be considered and acted upon on the eve of elections. Thus, whereas in a broader sense, the political factors exert a significant impact in government decision making in infrastructure development (especially in road works and irrigation projects), around election there is no significant deviation or change in these effects.

6.2.2 Decentralization and Its Impact

Political accountability with local empowerment is the main focus of ongoing efforts favoring decentralization. With the ballot box electing 3 million grassroots level political actors (including at least 1 million women and 660,000 persons belonging to SCs / STs), decentralization has opened the avenues for democratic participation by a sizable number of political entrepreneurs. Legal entitlements, equality and empowerment are breaking down the traditional hierarchical orders. Chattopadhyay and Duflo (2004) have asserted that

reservations favoring women in Panchayati Raj institutions (grass root level political set up as these are called in India) have tilted the balance in favor of those public goods most desired by marginalized groups and appropriate preferences for particular infrastructure works.

6.2.3 Evolving Institutional Design Supporting Democracy

On the evolving design of institutional architecture, the Economist in its recent 'A Survey of India' (Feb. 21 – 27, 2004) has reported as follows:

> In office, politicians switch allegiance as quickly as you can say, "Join the Cabinet". A new law tightens anti-defection provisions further and, perhaps more usefully, limits the number of ministers a state government can have....
>
> ...Election Commission rules now require candidates for office to reveal their educational background and criminal record. Along with a free press and an activist Supreme Court, the commission is one of a number of stubbornly independent unelected institutions that help to protect Indian democracy from the elected politicians. (p.12)

Thus recent statutory enactments are an effort in the direction of enforcing some political discipline, thereby reducing the rent seeking behavior of elected politicians. Political developments are in the direction of putting a more disciplined institutional framework in place. Such an institutional structure like free and fair elections, absence of rent extraction possibilities and competent political recruitment also has its implications for the political party system and its future evolution.

6.3 Economic Growth and Quality of Infrastructure

Our theoretical framework implies that in the presence of poverty and relative income deprivation political expediency is best met by providing a large amount for employment generation from the meagre state resources. With consequential poor quality of infrastructure, long-term economic development suffers in the process. Thus, it brings the issues of economic efficiency, Pareto optimality and political credibility to the fore. To establish new mass support, political configurations / parties are trying to drive this point before the voter but imposing a heavy price for citizens to bear in the long run. We analyze the impact of ICT on economic growth rate graphically as under:

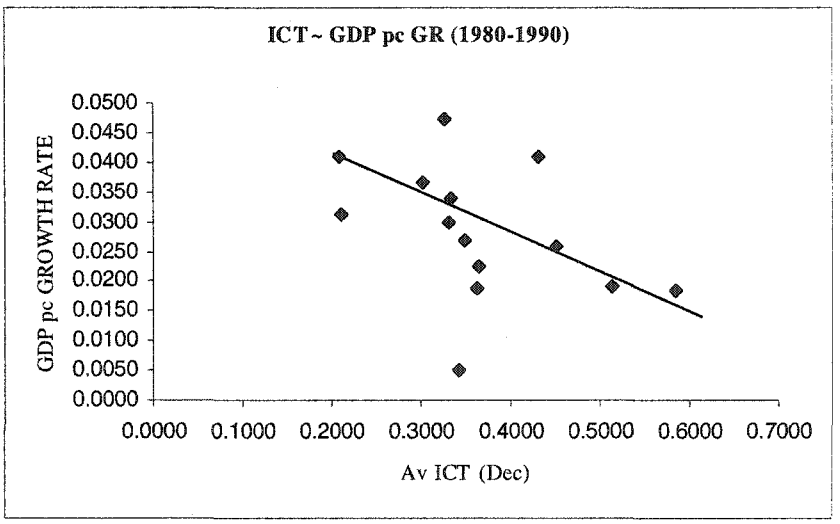

Figure 6.1 ICT and GDP pc Growth Rate (1980-1990)

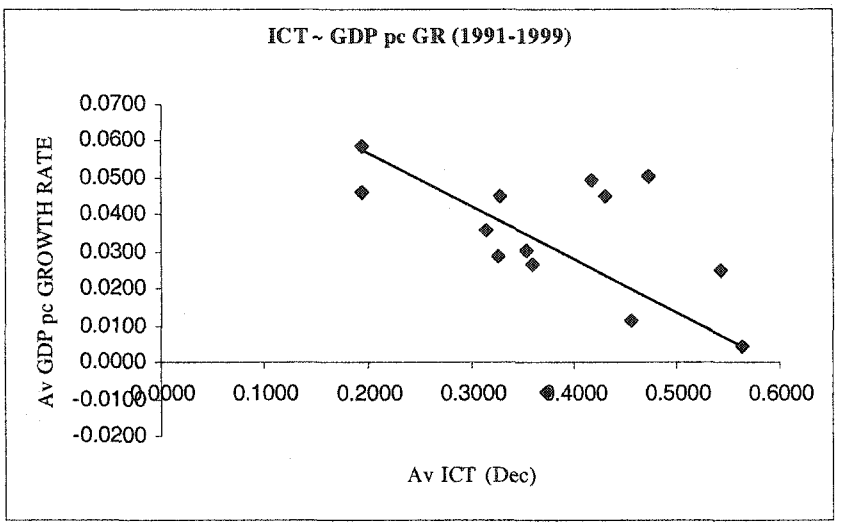

Figure 6.2 ICT and GDP pc Growth Rate (1991-1999)

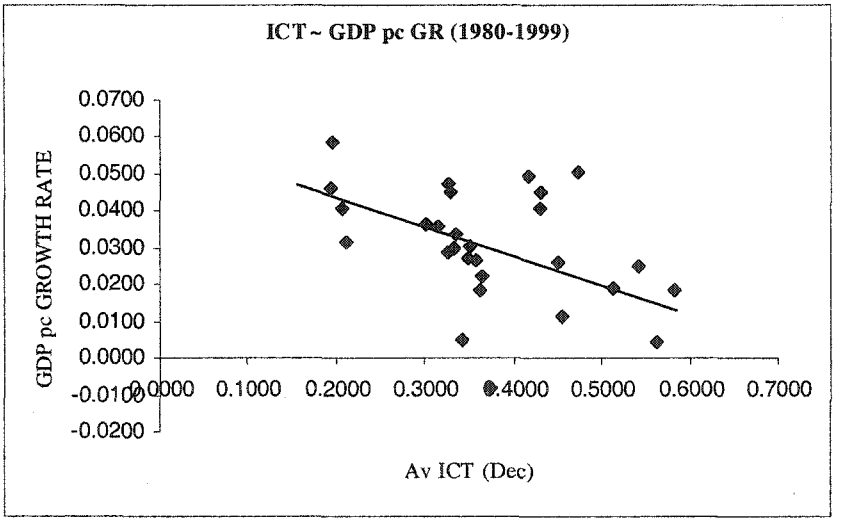

Figure 6.3 ICT and GDP pc Growth Rate (1980-1999)

This confirms the implications of our theoretical model. The trade-off between the economic growth rate and higher allocation for employment opportunities for poor unskilled labor resulting into lower quality of infrastructure is quite obvious.

6.4 Prognosis

With the above evident trade-off between insuring against relative deprivation and poverty and economic growth our finding raises questions as to prevailing awareness of this trade-off and the appropriate corrective measures in this respect. Recent developments in this regard are quite note-worthy.

6.4.1 Recent Steps for Irrigation Projects

In the Irrigation sector, Accelerated Irrigation Benefit Program (AIBP) was launched in the year 1996-97 providing loans by the Union government to State governments to complete irrigation projects. AIBP augments state resources for major and medium irrigation projects . Faster completion is possible with such funding available to state governments. This is equal to increasing the size of state resources or even providing more external assistance. Our model showed that the impact of such measures would be qualitative improvement in the infrastructure developed. In a few exceptional cases where important projects have been languishing for a very long time, Government of India has stepped in with funding. The case of Rajasthan Canal Project (now called Indira Gandhi Nahar Project – IGNP), which has

been continuing for more than four decades (of course with extended project coverage) illustrates this. Similarly specific area development programs (like one for Kalahandi, Balangir, Koraput districts of Orissa) have also been taken up. These steps have been undertaken only in the late 1990s and early 2000s. As such, one could hardly expect a significant impact during the analyzed time period (1980-1999).

6.4.2 Ensuring Connectivity to Villages

In December 2000, two national programs in the road sector were launched by Government of India. One is the 'National Highway Development Program' (NHDP) providing for 4 / 6 – laning of about 9000 miles of national highways. The second program is called 'Pradhan Mantri Gram Sadak Yojana' (PMGSY – Prime Minister's Rural Road Program). It seeks to provide all-weather roads to villages. The villages are accorded priority on population basis. Of the 275,748 non-accessible rural habitations 30,114 villages have been provided all-weather connectivity by March 2004. This provides earmarked funds for particular roads, use from which can not deviate.

6.4.3 Basic Livelihood Needs of Poor

Alongwith such targeted programs with backup of adequate funding, the needs of employment generation are also being addressed. To cater to the needs arising out of monsoon failures (which aggravates the demand for unskilled employment opportunities.), The National Calamity Relief Fund has been augmented substantially. This has resulted in

categorical segregation of resources to meet the demands of employment generation and infrastructure development. Thus the credibility gap is sought to be abridged while providing support to the poor.

6.5 Summary Findings

6.5.1 Future Research possibilities

It is felt that district level data could enrich the analysis further. However, obtaining district level data is not feasible, especially if one wants a large number of districts to be covered. A political economy model would certainly require an extensive information base regarding the districts for any meaningful analysis. However, this definitely is a possiblity that can be explored.

6.5.2 Analytical Inferences

There is significant evidence supporting the model with implications of relative deprivation and widespread poverty. This explains the qualitative dimension of infrastructure development, with its adverse long run impact on economic growth. Our theoretical model and the findings lead us to the following inferences:

(1) Socio-economic parameters, especially the extent of poverty and relative deprivation level are important contributors to improved understanding of regional imbalances

and the pattern of infrastructural development, especially in a developing country of sub-continental proportion like India.

(2) The empirical finding supports the argument that human resource development parameters like literacy rates also have a significant impact on the overall development process. This is found once the outliers are taken out. Presence of sizable group as a marginalized ans disadvantaged section of the society also adversely affects infrastructure quality and consequentially economic growth in the long run.

(3) Democratic institutions play an important role in limiting the rent available to the political leader. Although endogenous rent like corruption cannot be ruled out, other factors / variables contribute to our understanding of the situation.

(4) Rational opportunistic fundamentals are well suited to political economy modeling of a developing country.

(5) Democracy can play a positive role in the development of quality infrastructure and the consumption needs of poor households as well. Competent political leaders can make a difference. To that extent democratic devices and the legal framework have an important role.

(6) Such political economy models provide a unique tool incorporating socio-economic parameters like poverty and relative deprivation and enable us to explain the prevailing quality of infrastructure development in India and perhaps other democratic developing countries.

(7) Timing of election and changes in government do not have a statistically significant impact on ICT. This can be understood with pervasive and widespread absolute poverty and relative deprivation. There is continuous effort at government level to augment the consumption shortfalls of poor households. This is accounted for by including citizen's utility in the leader's utility.

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