WP-2012-015

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June 2012

http://www.igidr.ac.in/pdf/publication/WP-2012-015.pdf

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Abstract

This paper examines the effects of political factors on allocation of revenue budget for developmental expenditure by the sub-national governments, using data from 15 major states in India during the period 1971-2005. It measures the ruling party's political stronghold on the basis of constituency level electoral outcomes and shows that greater stronghold of the ruling party in a state leads to significantly higher proportion of revenue budget allocated for developmental expenditure. It also shows that voters' turnout and political regime change have positive and significant effect on proportion of revenue budget allocated for developmental expenditure. However, political ideology, within government fragmentation, disproportionality in representation, and effective number of political parties do not have any significant impact on budget allocation decisions of the Indian state governments. Results of this paper also indicate that greater reliance on market forces reduces the share of developmental expenditure. These are new and robust results.

Keywords: Political stronghold, budget allocation, developmental expenditure, state government, ruling party, political factors, India

JEL Classifications: D72, H72, D71

Acknowledgements: We would like to thank Karl Schlag and Elena Esposito for helpful comments and discussions. Usual disclaimer applies.

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Political Strongholds and Budget Allocation for Developmental Expenditure: Evidence from Indian States, 1971-2005

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1. Introduction

Public expenditure may be defined as the value of goods and services bought by the State and its articulations. It creates public endowments for the society and also generates positive externalities to the economy. Apart from the volume of public expenditure, its composition is considered to be an important factor for economic growth and development (Devarajan et al., 1996; Hong and Ahmed, 2009; Cozzi and Impullitti, 2010). In a democracy composition of public expenditure is expected to represent people's will. However, political-institutional incentives are likely to distort the allocation of budget for different categories of public expenditure.

It is also well recognized that developmental expenditures by the state governments are robust determinants of poverty reductions across Indian states (e.g., Dutt and Ravallion, 2002; Hong and Ahmed, 2009). Results of cross-country studies further reinforce the argument that developmental expenditure has serious repercussions to growth and development, particularly in case of developing countries (Gupta et al., 2002; Rajkumar and Swaroop, 2008). The purpose of this paper is to examine the effects of various political factors on allocation of revenue budget for developmental expenditure by the state governments in India. To be more specific, this paper attempts to answer the following questions, using data from 15 major states in India during 1971-2005. Does the extent of political stronghold of the ruling party in a state affect the share of revenue budget allocated for developmental expenditure? Is there any effect of voter's turn out, effective number of political parties, political regime change, political ideology, form and

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representativeness of the government, president's rule, and economic liberalization on government's preference for developmental expenditure?

The choice of state governments in India for the purpose of the present analysis rests on several considerations. First, India is the world's largest democracy and is federal in structure. Indian states are empowered with partial policy autonomy and there is diverse pattern of growth and development across states. Second, states in India widely differ in terms of political factors, despite having a common electoral law. Third, sub-national governments within a country share a more common institutional framework, unlike national governments of different countries, which makes the present analysis more effective than cross-country studies.

There is a large number of cross-country studies that attempt to examine the implications of political factors to government size and policy formulation (see, for example, Barro, 1991; Alesina et al, 1992; Baskaran 2011; Potrafke, 2011). Existence of federal states within a country adds an additional dimension. For example, Arulampalam et al (2009) argue that the central government of India being opportunistic makes the transfers to states based on political considerations, which in turn affects the size of the state governments. This paper deviates away from the issues related to government size and center-state transfers in order to focus on the allocation of revenue budget by the state governments.

We also note here that few studies have attempted to examine the determinants of government expenditure in the context of Indian states. However, most of these studies have primarily focused on existence of political business cycles at sub-national levels (e.g., Khemani 2004; Saez and Sinha, 2009). Lalvani (2005) examines the implications of the form of government, coalition or single party, on state governments' fiscal policies during the period 1966-1998, but abstains from examining budget allocation decisions. Uppal (2011) examines impact of legislative turnover on government size and allocation of budget between capital expenditure and revenue expenditure. On the other hand, Chhibber and Nooruddin (2004) examine state governments' preferences for developmental expenditure during the period 1967-1997. However, unlike the present paper, Chhibber and Nooruddin (2004) considers only a subset of the political factors and, thus, fail to recognize possible implications of factors such as political stronghold of the

ruling party, political regime change, president's rule, and representativeness of the legislative assembly of the state. The analysis of this paper is more comprehensive and it provides fresh evidence of the effects of various political factors on allocation of revenue budget by the sub-national governments of a developing country.

This paper constructs a new measure of political stronghold of the ruling party in a state, which is based on constituency level data on electoral outcome, and examines its impact along with that of other factors on state governments' preferences for developmental expenditure over non-developmental expenditure. Econometric analysis of this paper reveals that political stronghold of the ruling party in a state is an important determinant of the allocation of revenue budget for developmental expenditure in a state. A notable result is that greater political stronghold of the ruling party in a state leads to higher proportion of revenue budget allocated for developmental expenditure in that state. It seems to support the argument that higher possibility to retain the office induces the incumbent ruling party to be more accountable to citizens (Ferraz and Finan, 2011). This result remains valid, if we consider alternative measures of political stronghold, and it is not sensitive to the specification of the econometric model considered.

Analysis of this paper also reveals several other interesting results. It shows that political regime change, i.e. change of the political party in power, has significant positive impact on the share of revenue budget allocated for developmental expenditure. In other words, persistence of a particular political party in power seems to be detrimental for a state, as far as developmental expenditure is concerned. Moreover, results of this paper indicate that higher level of political participation of citizens in a state can lead to stronger preference for developmental expenditure, vis-à-vis non-developmental expenditure, of that state's government. It also shows that the extent of disproportional representation in the legislative assembly does not have any significant effect on revenue budget allocation by the state government. Further, it demonstrates that liberalization of the Indian economy has adversely affected the share of revenue budget allocated for developmental expenditure by the state governments. These are new results. In contrast to the findings of the existing studies, this paper shows that (a) the form of the government, coalition or single party, i.e. within government fragmentation, (b) effective number of political parties, (c)

political ideology and (d) president's rule do not have any significant effect on budget allocation decisions.

The rest of the paper is organized as follows. The next section describes the data and the variables considered in this analysis. Section 3 presents the econometric model and estimation methodology. Section 4 reports and discusses the estimation results. Section 5 concludes.

2. Data and Variables

For the purpose of the present analysis we consider 15 major states in India, namely, Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal, for the period 1971-2005. These 15 states cover about 90% of India's population. This analysis is based on data from various sources. Data on state government's expenditure is collated from Handbook of State Finances 2010 published by Reserve Bank of India for the years 1990-2005, and from Besley and Burgess (2002) for the earlier years. To measure the political factors, we use data from the statistical reports of general elections to the legislative assemblies of various states, issued by the Election Commission of India, and official websites of various state governments.

Dependent Variable: The dependent variable is the percentage of revenue expenditure allocated for developmental expenditure by a state government in a year. We mention here that the state governments' budget for revenue expenditure has three components: (a) developmental expenditure, (b) non-developmental expenditure and (c) grants-in-aid and contributions to local bodies and institutions. Developmental expenditure comprises of expenditure on various social services, such as health, education, family welfare, sanitation, social security, etc., and expenditure on economic services provided for agriculture and allied activities, rural development, irrigation, special area programs, energy supply, village and small industries development, tourism development, etc. On an average, 64.88% of revenue expenditure has been allocated for developmental expenditure by the state governments during the period of study 1971-2005 (see Table 1A).

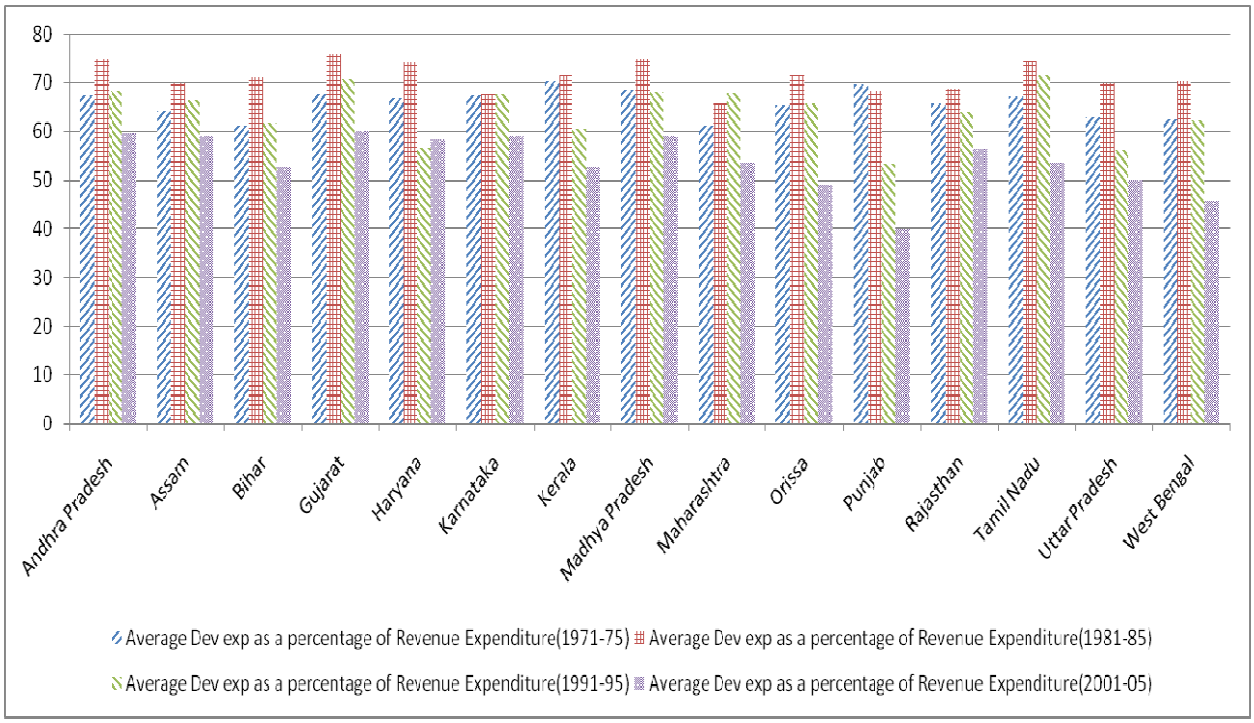
Table 1A: Summary Statistics

Variables	Number of Observations	Mean	Standard Deviation	Maximum	Minimum
Developmental Expenditure as a Percentage of Revenue expenditure	525	64.88	7.68	79.8	36.29
Stronghold	525	25.24	15.91	65.81	0
Coalition Govt.	525	0.326	0.47	1	0
Alteration in Power	525	0.659	0.47	1	0
Voter Turnout	525	62.86	9.89	87.9	23.8
Ideological Stand of Parties	525	0.065	0.49	1	-1
President Rule	525	0.103	0.3	1	0
ENP	525	2.69	1.19	7.39	1.41
ENP_v	525	3.97	1.21	8.46	2.29
DISPR	525	17.24	6.56	31.38	4.26

Interestingly, we observe that there is wide variation in terms of share of developmental expenditure across states and over time. We depict the five year average values of shares of developmental expenditures across states for four sub-periods in Figure 1. It seems that the relative importance, as perceived by the state governments, of developmental expenditure vis-à-vis non-developmental expenditure and grants-in-aid has undergone substantial changes over time in all the states. In most of the states the share of developmental expenditure has been reduced after 1981-85, though the scale of reduction differs across states. Also, note that even the range of average of the percentage of revenue expenditure allocated for developmental expenditure during the period of study is quite large, with the highest in Gujarat (69.60%) and lowest in Punjab (59.98%), see Table 1B. In the last year of the period of study, i.e., in 2005, the share of developmental expenditure was only 40.19% in Punjab, while that in Haryana was about 61.8%.

***Explanatory Variables*:** Since the focus of this paper is to examine political factors affecting allocation of revenue expenditure's budget for developmental expenditure by the state governments, we construct several variables to control for different aspects of political factors and institutions.

Figure 1: Developmental Expenditure as a percentage of Revenue Expenditure



Stronghold: First and foremost, we construct the variable *Stronghold* to examine the role of the political stronghold of the major ruling party in a state government to budget allocation. It is evident that, if an electoral constituency is stronghold of a political party, that party must win that constituency seat. However, a political party need not necessarily have stronghold in all the constituencies in which it won. In other words, winning of a constituency seat by a party is necessary, but not sufficient, condition to call that constituency as stronghold of a party. Whether a party has stronghold in a constituency or not that depends on the relative strength of that party vis-à-vis other parties in that constituency. If a party's strength in a constituency is greater than or equal to an appropriately defined critical value ($\hat{z}$), we may call that constituency as the stronghold of that political party.

Note that the strength of a political party in a constituency is likely to be reflected in that constituency's election results. One may argue that higher vote share of a party indicates greater strength of that party. However, vote share of a party is likely to depend on the number of parties contested for the seat as well as on relative strengths of contestants. In a multi-party political

system as in India, the winning party of constituency *i* may have higher vote share, but lower winning margin, compared to that of the winning party of constituency *j*. While higher vote share indicates greater strength, lower winning margin indicates closer contest and, thus, lower strength of the winning party. Therefore, higher vote share need not necessarily imply greater strength. Winning margin should also be taken in to account, along with the vote share, to measure strength of the winning party of any constituency.

Suppose party A wins in constituency *i* and party B wins in constituency *j*. Party A and Party B may be the same party or different parties. Then, (a) for any given winning margin, if the vote share of party A in constituency *i* is higher than that of party B in constituency *j*, strength of party A in constituency *i* is greater than the strength of party B in constituency *j*; (b) for any given vote share, if the winning margin of party A in constituency *i* is higher than that of party B in constituency *j*, strength of party A in constituency *i* is greater than the strength of party B in constituency *j*; and (c) if the winning margin (vote share of the winning party) in a constituency increases, the rate of increase in strength of the winning party in that constituency due to increase in vote share (winning margin) should also increase. That is, the measure of strength, *z*, of the winning party in a constituency must satisfy the following three properties.

(A1) $\frac{\partial z_i}{\partial v_i} > 0$,

(A2) $\frac{\partial z_i}{\partial m_i} > 0$ and

(A3) $\frac{\partial}{\partial m_i}\left(\frac{\partial z_i}{\partial v_i}\right) > 0,\ \frac{\partial}{\partial v_i}\left(\frac{\partial z_i}{\partial m_i}\right) > 0$;

where z_i, v_i and m_i denote the strength of the winning party, vote share of the winning party and winning margin, respectively, in constituency *i*. In other words, any function $z_i = f(v_i, m_i)$ that satisfies the (A1)-(A3), can be considered as a measure of strength of the winning party in constituency *i*. For simplicity, we can consider that $z_i = f(v_i, m_i) = v_i m_i$. Therefore, if $z_i = v_i m_i \geq \hat{z}$, we can say that the constituency *i* is a stronghold of its winning party.

Now, note that there is no obvious way to define the critical value $\hat{z}$. It seems to be more convincing to set the critical value based on observed values of *z*, instead of considering some arbitrary $\hat{z}$. Thus, we can consider that $\hat{z} = [mean(z)]\left[1 + \frac{h}{100}\right]$, *where* $h \geq 0$. That is, for a constituency to be stronghold of a party, that party must win that constituency seat and the strength of that party in that constituency must be greater than or equal to (some multiple of) the average value of the strengths (z_i) of all the winners in their respective constituencies in a state. For the purpose of the present analysis, we first consider that *h =0*. We also consider alternative values of *h* to check robustness of our results.

We define the measure *Stronghold* (S_w) as the percentage of constituencies in which the ruling party of a state has stronghold. That is, $S_w = \frac{n_1}{n}100$, where *n* is the total number of electoral constituencies in a state and n_1 ($\leq n$) in the number of constituencies in which the ruling party of the state has stronghold, as defined above. Clearly, higher value of S_w in a state indicates larger number of safe constituencies for the ruling party of that state, i.e. the ruling party's probability to win in the next election is sufficiently high in larger number of constituencies.

We note here that, in the existing literature, a constituency is often considered as the stronghold of a party, if that party has won all previous elections during a given period in that constituency. See, for example, Khemani and Keefer (2009). However, such categorization does not appear to be appropriate because of the following reasons. First, the results are likely to be different for different length of the period considered, and there is no obvious way to choose the length of the period. Second, it is quite plausible that a party wins a constituency in all the elections held during a particular period of time by a negligible margin or merely by chance. Third, delimitation of constituencies takes place at a regular interval in many countries including India, which makes it difficult to trace a particular constituency over a reasonable time period.[2] Delimitations often lead to significant changes in geographical boundaries of constituencies as well as voters' composition in constituencies to a large extent.

[2] In India Article 82 of the Constitution directs Parliament to enact a Delimitation Act after every Census.

Table 1B: States' Profiles: 1971-2005

States	No. of Observations	Share of Developmental Expenditure (%)	Stronghold (%)	No. of Years under Coalition Govt.	No. of Elections	No. of Alterations in Ruling Party	Voter Turnout (%)	No. of Years, which had instances of President Rule	ENP_V	ENP	$DISPR$
Andhra Pradesh	35	68.67	30.78	2	8	4	68.95	9	2.936	2.028	18.587
		(5.568)	(13.124)				(2.97)		(0.375)	(0.301)	(5.024)
Assam	35	65.33	29.32	15	7	6	69.32	8	3.791	2.541	16.656
		(4.720)	(15.318)				(11.24)		(1.194)	(0.908)	(5.973)
Bihar	35	62.34	19.66	12	7	6	58.03	9	5.535	3.486	14.725
		(6.283)	(7.509)				(4.29)		(1.088)	(0.862)	(3.853)
Gujarat	35	69.60	33.83	10	7	3	56.05	7	3.109	2.167	16.899
		(5.637)	(15.926)				(5.82)		(0.509)	(0.764)	(5.843)
Haryana	35	64.91	23.27	8	7	6	67.95	5	4.169	2.518	19.768
		(9.327)	(15.885)				(3.05)		(1.156)	(0.647)	(6.896)
Karnataka	35	66.30	26.94	2	8	5	66.93	8	3.378	2.267	17.552
		(4.000)	(13.840)				(3.15)		(0.608)	(0.630)	(5.995)
Kerala	35	64.50	3.66	35	7	7	74.53	7	6.534	5.737	8.933
		(7.433)	(2.466)				(3.03)		(0.848)	(1.165)	(3.624)
Madhya Pradesh	35	68.07	28.43	0	8	5	55.74	5	3.049	1.903	18.975
		(5.401)	(12.746)				(5.56)		(0.250)	(0.323)	(5.903)
Maharashtra	35	63.36	23.37	16	8	4	61.61	3	4.323	3.220	12.580
		(5.748)	(18.193)				(5.09)		(0.960)	(1.276)	(4.443)
Orissa	35	64.28	32.83	3	9	6	55.05	5	3.493	2.309	18.856
		(7.839)	(19.289)				(9.95)		(0.833)	(0.894)	(6.523)
Punjab	35	59.98	22.20	8	7	7	60.81	3	3.713	2.298	18.017
		(13.310)	(9.263)				(15.44)		(0.341)	(0.376)	(5.168)
Rajasthan	35	64.79	27.19	3	8	5	58.21	5	3.341	2.192	16.741
		(5.654)	(14.459)				(7.27)		(0.424)	(0.531)	(6.782)
Tamil Nadu	35	67.16	35.57	14	8	5	66.70	5	3.932	2.225	23.633
		(7.469)	(18.888)				(4.97)		(0.667)	(0.511)	(4.700)
Uttar Pradesh	35	60.56	12.95	13	9	7	51.39	9	4.712	2.990	15.999
		8.159)	(9.803)				(4.80)		(0.754)	(0.988)	(7.907)
West Bengal	35	62.09	28.56	30	7	1	71.68	4	3.594	2.492	20.652
		(8.675)	(10.815)				(9.28)		(0.520)	(0.504)	(5.629)

Notes: Standard errors are in parenthesis. No. of years under president's rule include the years of emergency (1975-1977) in India. 'Left front' is also considered as a coalition.

It seems to be most appropriate to assess the voters' attachment to a party through appropriately designed survey of voters in order to examine whether a constituency is a stronghold of a political party or not. If it is found that in a constituency, there is sufficiently large proportion of voters attached to a party, that constituency may be considered as a stronghold of that party. However, there is no such survey data available at constituency level in India, which renders it impossible to directly asses the voter's attachments to parties, and to measure a party's strength accordingly.

Higher level of political stronghold of the ruling party seems to indicate greater support base of that party and, thus, higher possibility to be reelected. It is argued that higher reelection possibility provides more incentive to a ruling party to be concerned about citizens' welfare (Ferraz and Finan, 2011). Therefore, higher political stronghold of the ruling party may induce that party to be more concerned about developmental sectors. In contrast, one may argue that higher reelection possibilities may induce the ruling party to perceive that its reelection possibility does not depend on development in the state and, thus, allocate lower percentage of revenue budget for developmental expenditure. Therefore, whether the effect of *Stronghold* on share of developmental expenditure is positive or negative remains an empirical question.

We present the state-wise average of *Stronghold* (considering h =0), along with its standard deviations, during 1971-2005 in Table 1B. The average of *Stronghold* was highest (35.57%) in Tamil Nadu, followed by Gujarat and Orissa, and lowest (3.66%) in Kerala. Clearly, there was wide variation in terms of political stronghold of the ruling parties across states. Further, there was also large variation in *Stronghold* over time in most of the states, which is indicated by high values of standard deviations of *Stronghold*.

Disproportional Representation (DISPR): It is well documented in the literature that all democratically elected bodies are not necessarily equally representative, even if the voting rule is the same (see, for example, Kaushik and Pal, 2012). Legislative assemblies of sates are also likely to differ from each other in terms of their representativeness. A legislative assembly may said to be perfectly representative, if each political party's seat share in that legislative assembly is equal to that party's vote share. On the other extreme, if only one party gets all the seats

without any voter's support, we have a dictatorial regime. Following Gallagher (1991), we consider the following measure of disproportional representation (DISPR), to examine the effect of representativeness of legislative assemblies.

$$\textit{Disproportional Representation (DISPR)} = 100\sqrt{\frac{1}{2}\sum_{j\in P}\left[\frac{s_j}{\sum_{k\in P}s_k}-\frac{v_j}{\sum_{k\in P}v_k}\right]^2},$$

where s_j denotes the number of seats of political party j in the legislative assembly, v_j denotes the number of votes received by the j-th political party and P denotes the set of political parties, in a state in a year. Clearly, *DISPR* takes the value zero, if the legislative assembly is perfectly representative. On the other extreme, if there is dictatorship, *DISPR* takes the value 100. Also, it is easy to observe that *DISPR* is increasing in the extent of disproportion between seat share and vote share. The average *DISPR*, taking all the states and years together, was 17.24, which indicates that on an average the legislative assemblies of states were far from perfectly representative. Nonetheless, as expected, representativeness of legislative assemblies varies across states and over time (Table 1B). Average *DISPR* was lowest (8.93) in Kerala and highest (23.63) in Tamil Nadu.

Electoral competition (ENP_v and ENP): One may argue that, if the number of political parties increases, competition faced by the political parties would be higher. However, note that all parties are not necessarily equally strong. It is widely observed that there are variations across political parties in terms of (a) their voters' support base and (b) number of seats won. It indicates that increase in number of political parties does not necessarily mean increase in competition in the election. Relative sizes of the political parties should be taken into account while measuring electoral competition (Laakso and Taagepera, 1979). The percentage of votes received by a political party as well as the number of seats won by a party can be viewed as the size of that political party. Given this backdrop, effective number of political parties (ENP_v), which is defined as follows, may be considered as an appropriate measure of electoral competition (Laakso and Taagepera, 1979).

$$ENP_v = \left[\sum_{j \in P} \left(\frac{v_j}{\sum_{k \in P} v_k} \right)^2 \right]^{-1},$$

where v_j denotes the number of votes achieved by the j-th party and P is the set of political parties. Clearly, ENP_v takes into account the relative sizes of the political parties. It can be interpreted as the number of hypothetical equal sized parties that would have the same total effect on electoral competition as have the actual parties of unequal size. It is evident that the lowest possible value of ENP_v is one, when only one party gets all the votes. On the other extreme, if all the parties get equal number of votes, ENP_v is equal to the number of parties. Clearly a higher value of ENP_v indicates more intense competition among political parties in election. We note here that this measure of competition in election has been widely used in the literature (see, for example, Chhibber and Nooruddin, 2004; Saez and Sinha, 2009; Bortolotti and Pinotti, 2008).

Note that the extent of competition in election can also be measured by considering share of seats received by a party as its size. In that case, we need to replace v_j by $s_{j,}$ in the above formula, where $s_{j,}$ denotes the number of seats won by the j-th party. We denote this measure based on seat share by *ENP*. Needless to mention here that the interpretation of *ENP* and its lower bound and upper bound remains the same as that of ENP_v . However, note that ENP_v and *ENP* need not necessarily be the same, unless vote share and seat share are same for all parties. To control for possible effects of electoral competition, we consider these two alternative measures of electoral competition in separate regressions. We report the descriptive statistics of these two measures of competition in election in Table 1A and 1B.

Voter Turnout: We consider the variable *Voter Turnout*, which is measured as the percentage of total number of voters casted their votes in an election for legislative assembly of a state, as the proxy for citizens' participation in the political process. Higher value of *Voter Turnout* indicates more politically active citizens and, thus, greater political participation of citizens. It seems to be likely that the extent of political participation of citizens would have effect on formation as well as functioning of governments, which in turn would have effect on budget allocation decisions. We observe that, on an average, Voter Turnout was about 63% in the sample states during the

period of study, and it varied between 51.39% in Uttar Pradesh and 74.53% in Kerala (see Table 1A and Table 1B).

Alteration in Power: Normally, election for State Legislative Assembly takes place after every five years in each of the Indian states. However, the year and the frequency of election differ across states to some extent, depending on the internal political scenario of a state. During the period of 35 years from 1971-2005, election for State Legislative Assembly took place seven times in seven states, eight times in six states and nine times in two states, out of 15 states in the sample. However, change of the major ruling party in the government, i.e., alteration in power, took place less frequently than the frequency of election, except in Kerala and Punjab. In West Bengal the major ruling party was altered only once, which is the least among all the states. See Table 1B for state-wise number of changes in the major ruling party, which is defined as the political party that formed the government or had the highest number of seats out of all the political parties that formed the coalition government, during the period of study. If an incumbent political party retains the power to govern a state, functioning of that state government may be different from that in case there is a change of the ruling party. Therefore, to control for possible effects of change in ruling party on budget allocation, we consider the dummy variable *Alteration in Power* as an explanatory variable in the regression. The variable *Alteration in Power* takes the value one if there is a change of major ruling party in the last election; otherwise it takes the value zero.

Coalition Government: Single party governments may have different preferences for developmental expenditure from that of multi-party coalition governments. We consider the dummy variable *Coalition Govt.* to control for possible effects of coalition government. *Coalition Govt.* takes the value one if there is a coalition government; otherwise it takes the value zero. Descriptive statistics shows that there were coalition governments in significant number of state-years, 117.15 out of 525. Except Madhya Pradesh, each of the other 14 states was ruled by coalition government at some point of time or the other during 1971-2005.

Ideology Stand: It is often argued that ideological stands of political parties play important role to shape government policies. Therefore, it seems to be important to control for possible effect of

party ideology on developmental expenditure. To this effect, we first categorize the political parties into three groups, namely, rightist, centrist and leftist, on the basis of their manifestos. We consider (i) Bhartiya Janata Party (BJP) and Janata Party (JP) as rightist political parties, (ii) Communist Party of India – Marxist (CPM), Communist Party of India (CPI), Communist Party of India–Marxist-Leninist (CPIML), Forward Block (FB), Revolutionary Socialist Party (RSP), Republican Party of India (RPI), Revolutionary Communist Party of India (RCPI), Party for Democratic Socialism (PDS), All India Forward Block (AIFB) and Democratic Revolutionary Peoples Party (DRPP) as leftist political parties, and (iii) all other political parties including Indian National Congress (INC) as centrist political parties. Such categorization of political parties in India is in line with the existing literature (see, for example, Pal 2010). We consider the categorical variable *Ideology Stand* as an explanatory variable. *Ideology Stand* takes the value one if the Chief Minister belongs to a rightist political party; it takes the value zero if the Chief Minister belongs to a centrist political part; and it takes the value minus one (-1) if the Chief Minister belongs to a leftist political party.

President Rule: Occasionally, elected government of a state was dissolved by the President of India and then that state was governed by the President's Rule until a new government was formed, depending on internal socio-political situation of the state. There were instances of President's Rule in Andhra Pradesh, Bihar and Uttar Pradesh in nine out of 35 years, while in Punjab and Maharashtra it was observed only in three out of 35 years. To control for possible implications of such extra ordinary situations, we consider the variable *President Rule*, which takes the value one if there is any instance of President's Rule in a state in a year; otherwise it takes the value zero.

We also consider (a) the dummy variables for the states to control of unobserved state-specific factors and (b) either the dummy variables for the years to control for unobserved time-specific effects or the dummy variable *Liberalization Dummy* to explicitly control for the possible effect of economic liberalization in India, in alternative regressions, suitably. The variable *Liberalization Dummy* takes the value one for post liberalization years, i.e., for 1991 and later years; otherwise, it takes the value zero.

3. Econometric Model and Estimation Methodology

We postulate the econometric model as follows.

$$Y_{nt} = \alpha + X_{nt}\beta + \varepsilon_{nt}, \quad (1)$$

where n refers to state and t refers to year, $n = 1, 2, 3, \ldots N$ and $t = 1, 2, 3, \ldots T$. The dependent variable Y_{nt} is the logit transformation of 'developmental expenditure as a percentage of revenue expenditure (Z_{nt})', Y_{nt} is defined as $Y_{nt} = log(\frac{Z_{nt}}{100 - Z_{nt}})$. Since Z_{nt} is bounded between zero and 100, and Z_{nt} does not take any extreme value (zero or 100), considering logit transformation of Z_{nt}, as mentioned above, seems to be appropriate in order to conform to the normality assumption. Nonetheless, if we consider standard log transformation of Z_{nt}, our results do not change. X_{nt} denotes the vector of explanatory variables, β is the vector of coefficients of explanatory variables and α is the intercept parameter, and ε_{nt} is the error term. We denote the $NT \times NT$ variance-covariance matrix of the errors by Ω with typical element being $E(\varepsilon_{nt}\varepsilon_{js})$, when the data are stacked by units (i.e., N time series are stacked).

It is well documented in the literature that there are several advantages in estimating models of above mentioned type utilising both time series and cross-section data together, which is referred as pooled time series cross-section (TSCS) analysis, rather than carrying out cross-section or time series analysis separately. First, combining time series and cross-section data together increases the number of observations, and thus, mitigates the 'small N' problem. Second, TSCS analysis may rely upon higher variability of data compared to simple time series or cross-section analysis. Third, TSCS analysis aims to capture the variations that emerge through two dimensions, time and space, simultaneously.

The appropriate method of estimation of Model (1) depends on the structure of the variance-covariance matrix Ω. If disturbances follow normal distribution; and $E(\varepsilon_{nt}) = 0$, $E(\varepsilon_{nt}^2) = \sigma^2$, $E(\varepsilon_{nt}\varepsilon_{jt}) = 0$ and there is no serial correlation, i.e., if disturbances are spherical, $\Omega = \sigma^2 \mathrm{I}_{NT \times NT}$,

ordinary least squares (OLS) provides consistent and efficient estimates of the parameters of the model. However, in case of time series cross-section setting, variances of errors may vary across states, i.e. errors may be heteroscedastic, errors may be contemporaneously correlated and/or there may be serial correlation of errors, for instance, errors may follow AR(1) process. In other words, error structure may be such that (a) $E(\varepsilon_{nt}) = 0$, (b) $E(\varepsilon_{nt}^2) = \sigma_n^2$, (c) $E(\varepsilon_{nt}\varepsilon_{jt}) = \sigma_{nj}$, and (d) $\varepsilon_{nt} = \rho\varepsilon_{n(t-1)} + e_{nt}$, where $E(e_{nt}) = 0$, $E(e_{nt}^2) = \sigma_{e,n}^2$ and $E(e_{nt}e_{jt}) = \sigma_{e,nj}$. Therefore, in the present context, it is unlikely to have spherical disturbances. And, in case of non-spherical disturbances, OLS provides consistent but inefficient estimates. Therefore, before estimating the model, we need to test for existence of heteroscedasticity, contemporaneous correlation and serial correlation. We perform widely used modified Wald test, Breusch-Pagan LM test and Wooldridge test, respectively, to check for heteroscedasticity, contemporaneous correlation and serial correlation. Results of these tests, reported in Table 4 in Appendix, confirm the presence of heteroscedasticity, contemporaneous correlation and first order autocorrelation. It implies that, disturbances are non-spherical and, thus, OLS estimates are not efficient.

To overcome the problem due to non-spherical disturbances, one can apply feasible generalized least squares (FGLS) method in case of temporally dominant (i.e., $T > N$) balanced panel data without much difficulty, which provides consistent and efficient estimates of the parameters (Greene 2003, Ch. 13; Baltagi 2008). To obtain FGLS estimates in presence of first order autocorrelation, contemporaneous correlation and heteroscedasticity, we need to first estimate the Model (1) by OLS and obtain the OLS residuals. Using the OLS residuals we can obtain consistent estimate of autocorrelation parameter, $\hat{\rho}$. Then, we need to apply Prais-Winsten transformation, using estimated $\hat{\rho}$, to transform the remainder AR(1) disturbances into serially independent errors and to obtain consistent estimate of the variance-covariance matrix, $\hat{\Omega}$. Finally, the Prais-Winsten transformed model is estimated by generalized least squares (GLS) method using $\hat{\Omega}$.

Since we have data for 15 states over 35 years and there is no missing data, i.e, the data set is temporally dominant and balanced panel, we employ FGLS method, taking in to account that

there is heteroscedasticty, contemporaneous correlation and first-order autocorrelation, to estimate Model (1) using alternative sets of explanatory variables.

It is argued that the above mentioned FGLS method of estimation may potentially underestimate the standard errors of estimated coefficients of time series cross-section models, which makes the FGLS estimation results unreliable (Beck and Katz 1995). Since OLS estimates are consistent, but not efficient, Beck and Katz (1995) proposes to consider (a) OLS estimates of the coefficients of the parameters, if there is no autocorrelation; and (b) coefficients of GLS estimates of Prais–Winsten transformation of the model, if there is first order autocorrelation. However, they propose to consider panel corrected standard errors (PCSE) that takes into account the cotemporaneous correlation, serial correlation and heteroscedasticity, in order to obtain reliable estimates of estimated coefficients' standard errors. The proposed PCSEs are based on a sandwich type estimator of the covariance matrix of the estimated parameters and are robust to the possibility of non-spherical errors. Several studies, particularly in the fields of comparative political science and sociology, have followed the suggestions of Beck and Katz (1995). However, Beck and Katz (1995) also pointed out that it is less likely to have the downward bias in standard errors of coefficient estimates from FGLS method, if the number of time points (T) is substantially larger than the number of cross-sectional units (N). Note that, we have $T = 35 >> N = 15$. Therefore, the FGLS estimates are likely to be reliable in case of the present study. Nonetheless, we estimate the models, corresponding to alternative specifications as discussed before, following the suggestions of Beck and Katz (1995). The results of the Beck-Katz estimates with PCSEs are reported in Table 5 in Appendix. We observe that results are not sensitive to alternative estimation methodologies.

We also note here that one may argue in favor of inclusion of lagged dependent variable in the model, since there is first order autocorrelation. However, if there is lagged dependent variable in the set of explanatory variables, OLS estimates are biased and inconsistent. The appropriate way to estimate dynamic panel data model seems to be by employing the generalized method of moments (GMM), following Arellano and Bond (1991) or Blundell and Bond (1998). However, the proposed GMM estimators of dynamic panel data models are designed for datasets with many panels and few periods, i.e., for datasets in which $N>>T$., which renders Arellano and

Bond (1991) and Blundell and Bond (1998) methodologies unsuitable in the present context. Therefore, it is appropriate to consider OLS estimates, with PCSEs, of a model without any lagged dependent variable in the present context, as suggested by Maddala et al (1997). Nonetheless, if we consider lagged dependent variable as an explanatory variable in the model and compute GMM estimates, main results of this analysis do not change substantially.

First, we consider *Stronghold*, *Coalition Govt.*, *Alteration in Power* and *Voter Turnout* as explanatory variables and estimate the model by FGLS method, the results of which are reported in column (1) of Table 2. Next, we introduce *Liberalisation Dummy* as an additional explanatory variable as reported in column (2) of Table 2, in order to examine the effects of liberalization of Indian Economy and to examine the sensitivity of results in column (1). Third, we drop *Liberalisation Dummy* and introduce *Year Dummies*, in order to control for time specific unobserved effects. We do not consider *Liberalization Dummy* and *Year Dummies* together in the regression to avoid the problem of multicollinearity. In other words, we estimate time-specific fixed effects model by FGLS method, results of which are reported in column (3) of Table 2. Fourth, we drop *Year Dummies* and consider *State Dummies*, which is the same as state-specific fixed effects model, to examine the implications of state specific unobserved effects on estimation results separately (see column (4) in Table 2). Fifth, we introduce *Liberalisation Dummy* along with *State Dummies* in the set of explanatory variables, which helps us to examine the effect of liberalization after controlling for state-specific unobserved effects, as reported in column (5) in Table 2. Finally, we estimate the model after controlling for both state-specific unobserved effects and time-specific unobserved effects. That is, we estimate the following econometric model by FGLS method.

$$Y_{nt} = \alpha + X_{nt}\beta \ + \sum_{n=1}^{N-1} \gamma_n (State\ \ Dummy)_n + \sum_{t=1}^{T-1} \delta_t (Year\ \ Dummy)_t + \varepsilon_{nt}, \qquad (2)$$

The variable $(State\ Dummy)_n$ is dummy variable, which takes value 1 if the state is *n*, otherwise it takes value zero; γ_n is the coefficient of $(State\ Dummy)_n$. Similarly, $(Year\ Dummy)_t$ is dummy variable, which takes value 1 if the year is *t*, otherwise it takes value zero; δ_t is the coefficient of the dummy for year *t*. Clearly, Model (2) is the dummy variable representation of two way fixed effects model. Estimation results of this model, when the vector X_{nt} consists of

(*Stronghold*, *Coalition Govt.*, *Alteration in Power* and *Voter Turnout*), are reported in column (6) of Table 2. We find that the results of FGLS estimation are robust to alternative specifications of the model.

We also estimate the Model (2) considering alternative measures of the variable *Stronghold*, as discussed in the previous section, by employing FGLS method and Beck-Katz method. See Table 6 for the FGLS estimates and Table 7 for the Beck-Katz estimates, when alternative measures of *Stronghold* have been considered. It is evident that the estimation results are not sensitive to alternative methodologies considered.

Moreover, from Table 2 and Table 6, we can say that our results are not sensitive to the measurement of *Stronghold*. Further, we estimate the Model (2) controlling for political ideology of ruling party (*Ideology Stand*), president's rule (*President Rule*), electoral competition (*ENP*, ENP_v) and disproportional representation in Legislative Assembly (*DISPR*). We find that the main results of the analysis are robust to such alternative specifications as well (see Table 3). Results of the present analysis also go through, if we consider post emergency period only, i.e. if we consider the period from 1978 to 2005 (see, Table 8). In sum, it seems that our results are not driven by the inclusion of data of pre-emergency and emergency periods together and our results are robust to (a) alternative methodologies of estimation, (b) alternative specifications of the model as well as (c) alternative measures of the variable *Stronghold*.

4. Estimation Results and Discussion

Table 2 presents the results of FGLS estimates of six different specifications of the model, as discussed in Section 3. It is evident that the coefficients of *Stronghold*, *Alteration in Power* and *Voter Turnout* are positive and significant, while the coefficient of *Coalition Govt.* is insignificant and negative, irrespective of whether we control for state specific unobserved effects and/or time specific unobserved effects or not. Moreover, these results do not change, if we consider only the *Liberalisation Dummy* in place of *Year Dummies*. Further, the above mentioned results remain unchanged, even if we control for other political variables that may have implications to developmental expenditure (see Table 3). Also, since all the political

variables used in the regression analysis were determined before the budget allocation decision took place in any given year, the problem of endogeneity is less likely to occur in the present analysis. Overall, it seems that these results are robust.

Table 2: Political Stronghold of Ruling Party and Developmental Expenditure

Dependent Variable: Logit transformation of 'developmental expenditure as a percentage of revenue expenditure'						
	(1)	(2)	(3)	(4)	(5)	(6)
Stronghold	0.0016*** [0.000]	0.0016*** [0.000]	0.0011*** [0.000]	0.0017*** [0.000]	0.0016*** [0.000]	0.0010*** [0.000]
Coalition Govt	-0.0047 [0.523]	-0.0098 [0.170]	-0.0037 [0.620]	-0.0055 [0.422]	-0.0087 [0.188]	-0.0010 [0.892]
Alteration in Power	0.0209*** [0.000]	0.0235*** [0.000]	0.0187*** [0.006]	0.0215*** [0.000]	0.0257*** [0.000]	0.0189*** [0.002]
Voter Turnout	0.0013** [0.005]	0.0014*** [0.001]	0.0012*** [0.005]	0.0012** [0.011]	0.0013*** [0.004]	0.0016*** [0.001]
Liberalisation Dummy		-0.0922*** [0.000]			-0.0915*** [0.000]	
Constant	0.1480*** [0.000]	0.1690*** [0.000]	-0.0299 [0.332]	0.0482 [0.396]	0.1040** [0.023]	-0.1180*** [0.004]
State Dummies	No	No	No	Yes	Yes	Yes
Year Dummies	No	No	Yes	No	No	Yes
Overall Significance Test:						
Wald Chi2	59.41	92.40	42505.40	178.60	384.70	101202.30
Prob. > Chi2	0.000	0.000	0.000	0.000	0.000	0.000
Number of Observations	525	525	525	525	525	525
Number of States	15	15	15	15	15	15
Time Periods	35	35	35	35	35	35
Common AR(1) Coefficient	0.7958	0.6661	0.6515	0.7681	0.5898	0.5153

Notes: Results are based on FGLS estimates. p-values are reported in brackets : * indicates p<0.1, ** indicates p<0.05, *** indicates p<0.01.

Note that the variable *Stronghold* measures the proportion of constituencies that are considered to be safe by the ruling party. That is, higher value of *Stronghold* indicates that the probability of the ruling party to be reelected in the next election is higher. A positive and significant

coefficient of *Stronghold* seems to imply that the ruling party rewards the state by allocating higher proportion of revenue budget for developmental expenditure, if the proportion of its safe constituencies is higher. This result seems to be in line with the findings of Ferraz and Finan (2011). Using data from Brazil, Ferraz and Finan (2011) show that Mayors with re-election incentive are more accountable to citizens than the Mayors with less possibility of getting reelected. In other words, concerns of the elected representatives for citizens' welfare increase with the increase in the probability of being reelected. Therefore, it seems that, on an average, state governments with lower probability to be re-elected would be less concerned about developmental works. This is in contrast to the view that lower probability of getting re-elected makes the ruling party more active to enhance their chances to retain the power through developmental works. Clearly, this is an interesting result.

We also find that there is positive and significant association of the dummy variable *Alteration in Power* with the share of developmental expenditure. It supports our supposition that functioning of a state government becomes different in case the incumbent ruling party is replaced by some other political party, compared to the situation when the incumbent political party retains the power to govern the state. If there is a change of the ruling party, the new ruling party allocates higher proportion of revenue budget for developmental expenditure. It indicates that change of political party in power is better for states, as far as developmental expenditure is concerned.

Positive and significant coefficient of *Voter Turnout* implies that higher proportion of politically active citizens helps to induce government to allocate higher proportion of funds for developmental expenditure. Intuition behind this result is as follows. A higher voters' turnout may result in victory of that political party which is more concerned about development, in the election. Alternatively, higher voters' turnout may indicate that there is greater pressure on government to carry out developmental works, which seems to be plausible particularly in case of developing countries like India.

We also find that the coefficient of the dummy variable *Coalition Govt.* is negative, but not significant even at 10% level. That is, there is no significant difference between a single party government and a coalition government in terms of allocation of revenue budget for

developmental expenditure. This result is in line with Chhibber and Nooruddin (2004). Lalvani (2005) finds that 'per capita revenue expenditure' and 'revenue expenditure as a percentage of state domestic products' are significantly higher in case there is coalition government compared to that in case of single party government in a state. Therefore, it seems that coalition governments tend to increase revenue expenditures, but not developmental expenditures at the expense of non-developmental expenditures.

Interestingly, we find that the coefficient of *Liberalization Dummy* is negative and significant, which indicates that proportion of revenue budget allocated for developmental expenditure by the state governments has declined in the post economic liberalization era compared to that in the pre liberalization period. This result is consistent with our descriptive statistics (see Figure 1), and it appears to be in contrast to the findings of Dreher et al. (2008). Therefore, it seems that greater reliance of the governments on private players and market mechanism after economic liberalization has made non-developmental expenditure and grants-in-aid contributions more appealing, compared to developmental expenditure, to the state governments.

Let us now turn to analyze the implications of other political factors, if any. One may argue that political parties that have greater reliance on market forces are likely to be more averse to government sponsored developmental projects. That is, the proportion of revenue budget allocated for developmental expenditure is likely to be lowest (highest) in case the ruling political party is leftist (rightist). However, we find that the coefficient of *Ideology Stand* is negative but insignificant, whereas the effects of other variables remain same as before (see, Column 6 in Table 2 and Column 1 in Table 3). It implies that political ideology of the Chief Minister, who inevitably belongs to the major ruling party, does not have any significant impact on allocation of revenue budget for developmental expenditure. This result is in line with the findings of Potrafke (2011) for OECD countries. We also find that the incidence of extra ordinary situation like President's Rule in a state does not play any role to influence state government's revenue budget allocation. When we introduce the dummy variable President Rule in the regression, effects of other variables remain unchanged and the coefficient of *President Rule* turns out to be positive but not significant at 10% level (see, Column 2 in Table 3).

Table 3: Controlling for political ideology, President's Rule and electoral competition and representativeness of Legislative Assembly

Dependent Variable: Logit transformation of 'developmental expenditure as a percentage of revenue expenditure								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stronghold	0.0008*** [0.000]	0.0008*** [0.000]			0.0008*** [0.001]		0.0007** [0.022]	0.0007** [0.036]
Ideology Stand	-0.0046 [0.471]							
President Rule		0.0049 [0.368]						
ENP			-0.0066 [0.113]					
ENPv				-0.0073* [0.070]	-0.0024 [0.586]			-0.0000 [0.984]
DISPR						0.0015*** [0.002]	0.0007 [0.210]	0.0007 [0.199]
Coalition Govt.	-0.0025 [0.705]	-0.0033 [0.615]	-0.0025 [0.749]	-0.0014 [0.845]	-0.0020 [0.768]	-0.0039 [0.588]	-0.0012 [0.864]	-0.0010 [0.885]
Alteration in Power	0.0136** [0.014]	0.0133** [0.016]	0.0180*** [0.004]	0.0108* [0.058]	0.0135** [0.015]	0.0164*** [0.009]	0.0181*** [0.004]	0.0179*** [0.005]
Voter Turnout	0.0017*** [0.000]	0.0017*** [0.000]	0.0011** [0.011]	0.0008* [0.077]	0.0017*** [0.000]	0.0013*** [0.002]	0.0016*** [0.001]	0.0016*** [0.001]
Constant	-0.1320*** [0.001]	-0.1250*** [0.002]	-0.0436 [0.214]	-0.0146 [0.713]	-0.1150** [0.011]	-0.1050*** [0.009]	-0.1280*** [0.002]	-0.1280** [0.011]
State Dummy Year Dummy	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
Overall Significance Test Wald Chi2 Prob > chi2	 39801.8 0.000	 39168.6 0.000	 94723.1 0.000	 38852.2 0.000	 37770.2 0.000	 104924.2 0.000	 105344.1 0.000	 105162.9 0.000
Number of Observations Number of States Time Periods	525 15 35	525 15 35	525 15 35	525 15 35	525 15 35	525 15 35	525 15 35	525 15 35
Common AR(1) Coefficient	 0.5132	 0.5142	 0.5093	 0.5143	 0.5157	 0.5130	 0.5146	 0.5149

Notes: Results are based on FGLS estimates. p-values are reported in brackets : * indicates p<0.1, ** indicates p<0.05, *** indicates p<0.01.

Further, we find that electoral competition, as measured by effective number of political parties, does not have any significant impact on share of developmental expenditure. If we do not control

for the variable *Stronghold*, the coefficient of ENP_v turns out to be negative and significant at 10% level, (see, Column 4 in Table 3). However, when we control for *Stronghold*, the coefficient of ENP_v becomes insignificant (see, Column 5 in Table 3). Therefore, it seems that ENP_v is picking up the effect of the ruling party's political stronghold, when ENP_v is considered in isolation. The coefficient of *ENP* is also insignificant at 10% level (see, Column 3 in Table 4). This result is in contrast to the conventional wisdom that electoral competition matters for delivery of public goods (Chhibber and Nooruddin, 2004; Saez and Sinha, 2009). Also, note that the effects of *Stronghold*, *Alteration in Power*, *Voter Turnout* and *Coalition Govt.* do not alter irrespective of whether we control for electoral competition or not.

Finally, we turn to examine whether disproportional representation in legislative assemblies plays any role to determine the share of developmental expenditure. We find that the coefficient of the variable *DISPR* is positive and significant only if we do not control for political stronghold of the ruling party (*Stronghold*), see Column 6 in Table 3. In all other cases, when we control for electoral competition (ENP_v) and/or *Stronghold*, the coefficient of *DISPR* turns out to be insignificant (see, Column 7 and 8 in Table 3). Therefore, it appears that the extent of representativeness of legislative assemblies does not have any significant effect on allocation of revenue budget for developmental expenditure by the state governments. It implies that, though greater representativeness of elected bodies is considered to be better for any democracy, discrepancies between seat share and vote share of the political parties need not necessarily distort the governments' preferences for developmental expenditure over non-developmental expenditure in case of developing countries with multiparty political system guided by majority voting rule.

It is interesting to note that the coefficient of *Stronghold* remains positive and significant even if we control for ENP_v and/or *DISPR*. Therefore, we can say that the result of positive and significant effect of political stronghold of the ruling party on allocation of revenue budget for developmental expenditure in a state is robust. As mentioned before, results of this analysis do not change if we consider alternative measures of ruling party's stronghold and/or employ alternative methodologies of estimation.

5. Conclusion

In this paper we have examined the effects of various political factors on budget allocation decisions of sub-national governments in India, by focusing on allocation of revenue budget for developmental expenditure. We have constructed a measure of political stronghold of the ruling party in a state, based on constituency level electoral outcome, to examine its impact on budget allocation. This is perhaps the first attempt to quantify the ruling party's political stronghold in case of multiparty political system, using disaggregated data. We use data from 15 major states in India during the period 1971-2005 for the purpose of the present analysis.

We find that political stronghold of the ruling party significantly affects the budget allocation decision of the government. Greater stronghold of the ruling party in a state leads to significantly higher proportion of revenue budget allocated for developmental expenditure. In other words, preference of a government for developmental expenditure over non-developmental expenditure and grants-in-aid contribution together is stronger, if the major ruling party of that government has stronghold in larger percentage of electoral constituencies than that of other governments. It implies that the ruling parties with lower probability to be re-elected divert funds from developmental sectors to spend more on fiscal services, secretariat services, pensions for government employees, etc. Econometric analysis of this paper also reveals that (a) the share of developmental expenditure increases with the increase in proportion of politically active citizens, which is measured by voters' turnout, in a state and (b) change of the ruling party leads to allocation of higher proportion of revenue budget for developmental expenditure compared to that in case the incumbent ruling party retains the office. Our results also indicate that greater reliance on market forces during the post economic liberalization in India has induced the state governments to reduce the share of developmental expenditure. These are interesting results.

Moreover, we demonstrate that within government fragmentation and political ideology of the ruling party do not have any significant effect on allocation of revenue budget for developmental expenditure by the state governments. Effective number of political parties in a state and representativeness of the state government also do not appear to play any role as far as the state governments' preferences for developmental expenditure is concerned. Our results are robust to alternative specifications of econometric model and estimation methodologies.

It is often argued that allocation of budget between capital expenditure and revenue expenditure plays important role for economic growth (Butkiewicz and Yanikkaya, 2011; Muinelo-Gallo and Roca-Sagalés, 2011; Devarajan et al., 1996). Therefore, it seems to be interesting to extend the present analysis, in line with Uppal (2011), to examine the implications of political stronghold of the ruling party on allocation of budget between capital expenditure and revenue expenditure. It might also be interesting to assess the role of political factors on relative importance paid to different social services, e.g., health, education, water supply, etc., by the governments, particularly in the context of developing countries. However, these are beyond the scope of the present paper. We leave these for future research.

References

Alesina, A., Gerald, D. C. and Nouriel, R. (1992) "Macroeconomic policy and elections in OECD democracies" *Economics and Politics,* Vol. 4(1), pp. 1-30

Arellano, M. and Bond, S. (1991) "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations" *Review of Economic Studies,* Vol. 58(2), pp. 277–297.

Arulampalam, W., Dasgupta, S., Dhillon, A. and Dutta, B. (2009) "Electoral goals and center-state transfers: A theoretical model and empirical evidence from India" *Journal of Development Economics,* Vol. 88(1), pp. 103-119.

Baltagi, B. H. (2008) *Econometric analysis of panel data*, 4th Edition, John Wiley, UK

Barro, R. J. (1991) "Economic growth in a cross section of countries" *Quarterly Journal of Economics,* Vol. 106(2), pp. 407-443

Baskaran, T. (2011) "Fiscal decentralization, ideology, and the size of the public sector" *European Journal of Political Economy*, Vol. 27(3), pp. 485-506

Baum, C. F. (2001) "Residual diagnostics for cross-section time series regression models" *Stata Journal*, Vol. 1(1), pp. 101–104

Beck, N. and Katz, J. N. (1995) "What to do (and not to do) with time-series cross-section data" *American Political Science Review*, Vol. 89(3), pp. 634-647

Besley, T. and Burgess, R. (2002) "The political economy of government responsiveness: theory and evidence from India" *Quarterly Journal of Economics,* Vol. 117(4), pp.1415–1451

Blundell, R. and Bond, S. (1998) “Initial conditions and moment restrictions in dynamic panel data models” *Journal of Econometrics*, Vol. 87(1), pp. 115–143

Bortolotti, B. and Pinotti, P. (2008) “Delayed privatization” *Public Choice*, Vol. 136(3-4), pp. 331-351

Butkiewicz, J. L. and Yanikkaya, H. (2011) “Institutions and the impact of government spending on growth” *Journal of Applied Economics*, Vol. 14 (2), pp. 319-341

Chhibber, P. and Nooruddin, I. (2004) “Do party systems count? The number of parties and government performance in the Indian states” *Comparative Political Studies*, Vol. 37(2), pp.152–187

Cozzi, G. and Impullitti, G. (2010) “Government spending composition, technical change, and wage inequality” *Journal of the European Economic Association*, Vol. 8(6), pp. 1325-1358

Devarajan, S., Swaroop, V. and Zou, H. (1996) “The composition of public expenditure and economic growth” *Journal of Monetary Economics*, Vol. 37(2), pp. 313-344

Dreher, A., Sturm, J-E., and Ursprung, H. (2008) “The impact of globalization on the composition of government expenditures: Evidence from panel data” *Public Choice*, Vol. 134(3), pp. 263-292

Drukker, D. M. (2003) “Testing for serial correlation in linear panel-data models” *Stata Journal*, Vol. 3(2), pp. 168-177

Dutt, G. and Ravallion, M. (2002) “Is India’s economic growth leaving the poor behind?” *Journal of Economic Perspectives*, Vol.16 (3), pp. 89-108

Ferraz, C. and Finan, F. (2011) “Electoral accountability and corruption: Evidence from the audits of local governments” *American Economic Review*, Vol. 101(4), pp. 1274–1311

Gallagher. M. (1991) “Proportionality, disproportionality and electoral Systems” *Electoral Studies*, Vol. 10(1), pp.33-51

Greene W, (2003) *Econometric Analysis*, 5th Edition, *Pearson Education*, New Delhi

Gupta, S., Verhoven, M. and Tiongson, E. (2002) “The effectiveness of government spending on education and health care in developing and transition economies” *European Journal of Political Economy*, Vol. 18(4), pp. 717–737

Hong, H. and Ahmed, S. (2009) “Government spending on public goods: Evidence on growth and poverty” *Economic and Political Weekly*, Vol. 44(31), pp. 102-108

Kaushik, A. and Pal, R. (2012) “How representative has the Lok Sabha been?” *Economic and Political Weekly*, Vol. 47(19), pp. 74-78

Khemani, S. (2004) “Political cycles in a developing economy” *Journal of Development Economics*, Vol. 73(1), pp. 125–154

Khemani, S. and Keefer, P. (2009) “When do legislators pass on pork? The role of political parties in determining legislator effort” *American Political Science Review*, Vol. 103(1), pp. 99-112

Laakso, M. and Taagepera, R. (1979) “The effective number of parties: A measure with application to West Europe” *Comparative Political Studies*, Vol. 12(1), pp. 3-27

Lalvani. M. (2005) “Coalition governments: Fiscal implication for the Indian economy” *American Review of Political Economy*, Vol. 3(1), pp. 127-163

Maddala, G. S., Li, H., Trost, R. P. and Joutz, F. (1997) “Estimation of short-run and long-run elasticities of energy demand from panel data using shrinkage estimators” *Journal of Business Economics and Statistics* Vol. 15(1), pp. 90-100

Muinelo-Gallo, L. and Roca-Sagalés, O. (2011) “Economic growth and inequality: The role of fiscal policies” *Australian Economic Papers*, Vol. 50(2-3), pp. 74-97

Pal, R. (2010) “Impact of communist parties on the individual decision to join a trade union: Evidence from India” *The Developing Economies***,** Vol. 48(4), pp. 496 – 528

Potrafke, N. (2011) “Does government ideology influence budget composition? Empirical evidence from OECD countries” *Economics of Governance*, Vol. 12(2), pp. 101-134

Rajkumar, A. S. and Swaroop, V. (2008) “Public spending and outcomes: Does governance matter?” *Journal of Development Economics*, Vol. 86(1), pp. 96-111

Saez, L. and Sinha, A. (2009) “Political cycles, political institutions, and public expenditure in India, 1980-2000" *British Journal of Political Science*, Vol. 40(1), pp. 91-113

Uppal, Y. (2011) “Does legislative turnover adversely affect state expenditure policy? Evidence from Indian state elections” *Public Choice*, Vol. 147(1), pp. 189–207

APPENDIX

A1 Diagnostic tests for heteroscedasticity, contemporaneous correlation and autocorrelation

Table 4: Tests for Heteroscedasticity, Contemporaneous Correlation and Autocorrelation

	(1)	(2)	(3)	(4)	(5)	(6)
Modified Wald test for heteroscedasticity H0: $\sigma_n^2 = \sigma^2$. H1: $\sigma_n^2 \neq \sigma^2$						
χ^2 (15) =	272.92	143.31	355.98	250.64	94.79	473.29
Prob> χ^2 =	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Breusch-Pagan LM test for contemporaneous correlation H0: $\sigma_{nj} = 0$. H1: $\sigma_{nj} \neq 0$						
χ^2 (105) =	1649.727	1051.926	437.939	1576.261	1039.70	383.452
Prob> χ^2 =	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Wooldridge test for first order autocorrelation H0: $\rho = 0$. H1: $\rho \neq 0$						
F(1, 14) =	41.545	42.851	38.072	41.545	42.851	38.072
Prob > F =	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Notes: Test results in column (1) corresponds to the base-line regression of Model 1 with the explanatory variables Stronghold, Coalition Govt., Alteration in Power and Voter Turnout. Base-line regression corresponding to column (2) includes Liberalisation Dummy as an additional explanatory variable. Next, we drop Liberalisation Dummy and introduce Year Dummies in the base-line regression for column (3). Then we drop Year Dummies and introduce State Dummies for the base line regression corresponding to column 4. In base-line regression corresponding to column (5) we introduce Liberalisation Dummy along with State Dummies. Finally, we drop Liberalisation Dummy and introduce Year Dummies along with State Dummies to perform the baseline regression for results in column (6).

Modified Wald test is a Chi-square test for group wise heteroscedasticity, which tests the null hypothesis of a common variance $\sigma_n^2 = \sigma^2$ against the alternative of group wise heteroscedasticity, where the test statistic is $\chi^2(N)$ distributed. The Breusch-Pagan LM test of cross-sectional independence is based on the average of the squared pair-wise correlation coefficients of the residuals and is applicable in the case of temporally dominant (i.e., $T > N$) panel data models where the cross section dimension (N) is small relative to the time dimension (T). Under the null hypothesis $\sigma_{nj} = 0 \quad (\forall \quad n, \quad j = 1, 2, ..., \quad N; n \neq j)$, the LM statistic is $\chi^2\left(\frac{N(N-1)}{2}\right)$ distributed. See Greene (2003) and Baum (2001) for details. In Wooldridge test for autocorrelation in panel data the test statistic is based on heteroscedasticity and autocorrelation consistent (HAC) standard errors, which makes the test robust against cross-sectional heteroscedasticity. Under the null hypothesis of no first order autocorrelation, the test statistic follows *F*(1, T-1)-distribution. See Woodlridge (2002) and Drukker (2003) for details.

A2 Beck-Katz estimates with panel corrected Standard Errors

Table 5: Electoral stronghold of ruling party and developmental expenditure – Beck-Katz estimates with panel corrected Standard Errors

Dependent Variable: Logit transformation of 'developmental expenditure as a percentage of revenue expenditure

	(1)	(2)	(3)	(4)	(5)	(6)
Stronghold	0.0022***	0.0022***	0.0012***	0.0022***	0.0020***	0.0015***
	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]
Coalition Govt.	-0.0154	-0.0197	-0.0112	-0.0147	-0.0167	-0.0094
	[0.222]	[0.106]	[0.300]	[0.258]	[0.194]	[0.421]
Alteration in Power	0.0274**	0.0312***	0.0120	0.0272**	0.0368***	0.0054
	[0.017]	[0.010]	[0.164]	[0.020]	[0.003]	[0.533]
Voter Turnout	0.0017**	0.0016**	0.0017***	0.0016*	0.0014	0.0017**
	[0.042]	[0.044]	[0.008]	[0.068]	[0.135]	[0.050]
Liberalisation Dummy		-0.0904***			-0.116***	
		[0.006]			[0.000]	
Constant	0.0615	0.124**	-0.0564	-0.0031	0.0972	0.0030
	[0.373]	[0.038]	[0.235]	[0.971]	[0.226]	[0.970]
State Dummies	No	No	No	Yes	Yes	Yes
Year Dummies	No	No	Yes	No	No	Yes
R- Squared	0.0670	0.1300	0.4660	0.0842	0.2310	0.2541
Overall Significance Test:						
Wald Chi2	29.44	43.49	4606.9	99.64	296.9	152.77
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
Number of Observations	525	525	525	525	525	525
Number of States	15	15	15	15	15	15
Time Periods	35	35	35	35	35	35
Common AR(1) Coefficient	0.8307	0.6849	0.6796	0.8088	0.6100	0.7794

Notes: p-values are reported in brackets : * indicates p<0.1, ** indicates p<0.05, *** indicates p<0.01.

A3 Robustness Analysis with alternative measures of stronghold

As mentioned before, we do some robustness checks using alternative measures of political stronghold of the ruling party. We study four different measures of political stronghold. We change the critical value of "Vote share of winner*Margin of win" from the average value to 105% and 110% of average value, and denote the new variables by *SW2* and *SW3*, respectively. Other than these two measures, we also consider the average winning margin (*SM1*) and 110% of average winning margin (*SM2*) as alternative measures of political stronghold of the ruling party.

Table 6: Robustness analysis using alternative measures of electoral Stronghold

Dependent Variable: Logit transformation of 'developmental expenditure as a percentage of revenue expenditure

	(1)	(2)	(3)	(4)
SW2	0.0009***			
	[0.000]			
SW3		0.0009***		
		[0.000]		
SM1			0.0009***	
			[0.001]	
SM2				0.0009***
				[0.000]
Coalition Govt.	-0.0018	-0.0015	-0.0007	-0.0022
	[0.800]	[0.832]	[0.922]	[0.742]
Alteration in Power	0.0191***	0.0192***	0.0181***	0.0126**
	[0.002]	[0.002]	[0.004]	[0.023]
Voter Turnout	0.0015***	0.0016***	0.0015***	0.0018***
	[0.001]	[0.001]	[0.001]	[0.000]
Constant	-0.1150***	-0.1180***	-0.1130***	-0.1310***
	[0.005]	[0.004]	[0.006]	[0.001]
State Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Overall Significance Test:				
Wald Chi2	101996.0	101396.0	102968.4	38222.7
Prob > chi2	0.000	0.000	0.000	0.000
Number of Observations	525	525	525	525
Number of States	15	15	15	15
Time Periods	35	35	35	35
Common AR(1) Coefficient	0.5167	0.5162	0.5138	0.5145

Notes: Results are based on FGLS estimates. p-values are reported in brackets : * indicates p<0.1, ** indicates p<0.05, *** indicates p<0.01.

Table 6 presents the results of FGLS estimation corresponding to alternative measures of *Stronghold*. Clearly, our results are not sensitive to alternative measures of *Stronghold* (see Table 2 and Table 6). We also compute the Beck-Katz estimates with panel corrected Standard Errors to check the robustness of our results with alternative measures of Stronghold and estimation method, which we present in Table 7. It is evident that our results are robust to alternative methodology of estimation as well.

Table 7: Robustness analysis using alternative measures of electoral Stronghold - Beck-Katz estimates with panel corrected Standard Errors

Dependent Variable: Logit transformation of 'developmental expenditure as a percentage of revenue expenditure

	(1)	(2)	(3)	(4)
SW2	0.0009**			
	[0.021]			
SW3		0.0009**		
		[0.024]		
SM1			0.0008**	
			[0.042]	
SM2				0.0008**
				[0.044]
Coalition Govt.	-0.0075	-0.0073	-0.0063	-0.0068
	[0.486]	[0.498]	[0.563]	[0.533]
Alteration in Power	0.0178**	0.0179**	0.0171**	0.0171**
	[0.019]	[0.019]	[0.025]	[0.026]
Voter Turnout	0.0019**	0.0019**	0.0018**	0.0019**
	[0.011]	[0.011]	[0.014]	[0.013]
Constant	-0.1320**	-0.1330**	-0.1280**	-0.1290**
	[0.035]	[0.035]	[0.043]	[0.044]
State Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
R- Squared	0.611	0.612	0.612	0.612
Overall Significance Test:				
Wald Chi2	12512.0	1.11814e+15	1560.7	1.45E+15
Prob > chi2	0.000	0.000	0.000	0.000
Number of Observations	525	525	525	525
Number of States	15	15	15	15
Time Periods	35	35	35	35
Common AR(1) Coefficient	0.5376	0.5371	0.5350	0.5356

Notes: p-values are reported in brackets : * indicates p<0.1, ** indicates p<0.05, *** indicates p<0.01.

A4 A Further Robustness Check: Exclusion of Emergency period

One may suspect that the results might change, if we exclude the period of emergency in India from our study. Note that, during the period of emergency in India (1975-1977), all states were under the President's Rule simultaneously. Therefore, we re-estimate the model by considering only the post emergency period (1978-2005), results of which are reported in Table 8.

Table 8: Estimates for post emergency period: 1978-2005
(Robustness Check)

Dependent Variable: Logit transformation of 'developmental expenditure as a percentage of revenue expenditure

	(1)	(2)
Stronghold	0.0010***	0.0005*
	[0.001]	[0.061]
ENP_V		-0.0022
		[0.640]
DISPR		0.0009*
		[0.096]
Coalition Govt.	-0.0058	-0.0062
	[0.469]	[0.381]
Alteration in Power	0.0126*	0.0074
	[0.079]	[0.219]
Voter Turnout	0.0014***	0.0016***
	[0.005]	[0.001]
Constant	-0.0957**	-0.1070**
	[0.042]	[0.023]
State Dummies	Yes	Yes
Year Dummies	Yes	Yes
Overall Significance Test:		
Wald Chi2	150955.4	47727.8
Prob > chi2	0.000	0.000
Number of Observations	420	420
Number of States	15	15
Time Periods	28	28
Common AR(1) Coefficient	0.4751	0.4722

Notes: Results are based on FGLS estimates. p-values are reported in brackets : * indicates p<0.1, ** indicates p<0.05, *** indicates p<0.01.

***