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Abstract

With the exception of Brander and Drazen (2008), who use a comprehensive cross-country database consisting of both developed and developing countries, the hypothesis that rapid growth helps incumbents win elections has been tested exclusively for the developed countries (e.g., Ray Fair 1978). But since sustained rapid growth offers the prospect of pulling vast numbers of the voters out of poverty within a generation, such an effect is far more likely to be present in the developing rather than developed countries. In this paper, we offer the first test of the hypothesis on a large developing and poor country, India, which has seen its economy grow 8 to 9 percent recently. We first generalise the Fair model to allow for multiple candidates instead for just two, and then test it using cross-state data. We find quantitatively large and statistically robust effect of growth on the prospects of the candidates of the state incumbent parties to win elections. Specifically, we use the data on 422 candidates in the 2009 parliamentary elections and show that the candidates of incumbent parties in high-growth states have much better prospects of victory than those in low-growth states.

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Growth and Election Outcomes in a Developing Country

Introduction

Despite the intuitive appeal of the idea that good economic outcomes such as sustained rapid growth should help incumbents win elections, evidence on it has been sparse. With the exception of the United States, scholars have been unable to find such effect in the developed countries. Ray Fair (1978) first found such an effect on the ability of the incumbent United States presidents to return to office. Subsequently, Alberto Alesina and Howard Rosenthal (1995) also found a similar effect. But the other studies devoted to answering the same question in other developed countries including G. Bingham Powell Jr. and Guy D. Whitten (1993), Paldam (1991), Kaare Strom and Seymour M. Lipset (1984) and Lewis-Beck (1988) have failed to find a statistically significant effect.

More recently, Adi Brender and Allan Drazen (2008) have used a comprehensive cross-country dataset spanning over 74 developed and developing democratic countries and 350 election episodes to examine whether GDP growth during the term in office or specifically in the election year help incumbents win elections. They find that on average, growth does help incumbents win elections in the developing but not developed countries. In addition to growth, these authors also assess the impact of loose fiscal policy during the term of the incumbent or the election year on the election outcome.

While the Brender and Drazen study, thus, finds a positive effect of growth on election outcomes for the incumbents in the developing countries on average, there currently exists no study exclusively devoted to identifying the effect of growth on election outcomes in a developing country. This is somewhat disappointing since one would expect that it is precisely in the poor countries that the electorate most values sustained rapid growth. Moreover, it will also be good to know if democracy and development indeed go hand-in-hand as many analysts argue.

In the present paper, we attempt to fill this important gap by studying the link between growth and electoral success in India. It may be noted at the outset, however, that in doing so, we cannot follow the bulk of the literature, which studies the relationship between growth and the ability to win elections in the context of the head of the state, either the president or prime minister. Although India is one of a handful of developing countries with a virtually unbroken record of democracy for more than 60 years, even it has not had enough parliamentary elections to credibly allow us to test the impact of growth on prime ministerial outcome. The difficulty at this level is compounded by the fact that during the first four decades, there was very limited variation in the national growth rate over time. Moreover, since the Congress was the only major party at the national level at independence, it remained the only viable alternative at the centre for the first twenty-five years. Other parties as credible claimants of prime ministerial position began to emerge only after the Congress itself split in 1969 and again in 1977.

Therefore, our approach is to move away from studying the electoral prospects of the national leaders and focus, instead, on the members of Lok Sabha, the lower house of the parliament. These members contest elections from constituencies located in

different states, which in turn exhibit differential growth performance. It is this variation in state-level growth that we exploit. Since the Lok Sabha has 543 members, even a single election yields sufficiently large sample to permit the analysis of the determinants of the election outcomes.

Our central assumption in the paper is that the voter in a constituency views the government of the state in which that constituency is located as the entity responsible for his economic fortunes relative to his counterparts in other states. To be sure, the central government policies have a bearing on the overall growth but since these policies are uniform across states, they do not form a basis of distinction across constituencies. Likewise, the local government within the constituency also matters but despite some devolution of power to local levels in recent years, the state government remains by far the most influential force other than the central government within the Indian federation. It is the state government officials who are responsible for the implementation of both the central and state level development programmes and polices within all constituencies of the state. In terms of his contact with officials, the voter must typically deal with state officials; indeed, it is extremely rare for him to see central government officials.

Under this assumption, if economic performance indeed influences the voter's behaviour, he would reward the candidate nominated by the state incumbent party if it has delivered favourable growth outcome and punish him if the opposite is the case. This holds true regardless of whether or not the candidate himself is an outgoing member of the parliament. Incumbency in this conception is defined at the level of the state rather than the individual contestant. As long as the state incumbent party nominates the candidate, he is subject to the externality, positive or negative, arising out of the party's performance in the state. Under our hypothesis, the electorate rewards the candidates of the party of the head of the state, called the chief minister, if he delivers good growth outcome and punishes him, if the opposite. This translates in the share of votes received by the candidate of the state incumbent party being positively impacted by favourable growth outcome.

The study of the relationship between growth and election outcomes at the level of the candidate within the same country has at least two advantages over cross-country analysis. First, by concentrating at the sub-national level within the same country, we are able to automatically hold constant some of the variables such as the level of development, national policy framework, cultural and environmental factors and the nature and length of democracy that may be relevant to election outcomes. Second, in the Indian context, the focus on the candidate allows us to assess the effect of individual candidate characteristics such as age, gender, education, pending criminal cases and wealth, which are all readily comparable within a country. Under the current election laws, all candidates contesting elections in India are required to file an affidavit with the Election Commission of India containing information on these characteristics, which is made public. We painstakingly collect this information and judiciously incorporate it in our regressions.[1]

[1] The distribution of these characteristics across candidates and eventual winners of elections turns out to be an interesting exercise in its own right. We undertake this task in a companion paper, Gupta and Panagariya (2011). This paper also provides several institutional details relating to Indian elections.

We carry out our analysis for the 2009 parliamentary election, India's fifteenth since the adoption of the Constitution. We expect this election to offer the best prospects for identifying the effect of growth on the vote share of the candidate of the state incumbent party. This is because the 2009 election was the first parliamentary election to be preceded by a shift in the country's growth rate to the miracle-level of 8 to 9 percent. If the voters value growth, they could not have asked for a louder and clearer signal than during this period. The poor, who are expected to see significant improvements in their fortunes in a rapidly growing economy as they indeed did according to the expenditure surveys conducted by the National Sample Survey, happen to vote massively in India. Therefore, growth effects on election outcomes are most likely to be present in this election.[2]

The paper is organised as follows. In *Section* 2, we outline our main result in its simplest but dramatic form. The result is that growth played a central role in determining the fortunes of the candidates of the state incumbent party. In *Section* 3, we extend the model in Fair (1978) to a multiple-candidate setting. In its original form, this model offers the rationale for estimating a single aggregate equation for the proportion of votes received by the incumbent candidate in a direct contest involving only two candidates. We extend a special case of this model to allow multiple candidates, which is the norm in India: of the 543 contests in the 2009 parliamentary elections in India, everyone involved three or more candidates. In *Section* 4, we estimate the model and show that the result we outline in *Section 1* is robust to quantitative assessment. In *Section* 5, we conclude the paper.

2. The Key Result: A Quick Preview

We begin by previewing our main result at the outset. This requires us to make more precise our definition of the incumbent party at the level of the state and to define the relative economic performance of the states and divide the states into high- medium- and low-growth states. We define as the incumbent party the main ruling party in power (or two main parties if they shared power) in 2007 and the preceding two or more years. This means that if a state legislative assembly election was held in 2008 or 2009 and the government changed hands, the outgoing party is still considered the incumbent in that state for purposes of the 2009 national elections, held in April and May of that year. It is a plausible assumption that the electorate would not have had enough time to judge the performance of a party that has been in power for at most a little more than a year in terms of growth. This is especially true in view of the lags with which policies impact

[2] This is in the spirit of Jagdish Bhagwati and Panagariya (2004). Referring to the lack of reaction to the poor economic performance on the part of the voter, who kept returning the Congress to power until the late 1980s (except once in 1977 when it voted out the latter in reaction to the emergency rule Mrs. Gandhi had imposed beginning in 1975), these authors hypothesise, "Perhaps, when little progress takes place all around, the centuries-old Indian fatalism takes over. But when the poor begin improving [as in the post-reform era], then the 'revolution of rising expectations' is likely to arise. This is a direct result of the perception of real possibilities." Elaborating on this revolution of perceived possibilities, they add, "The young of India, including children from the lowest classes and castes, have enhanced expectations from life; and so do their parents, who vote. And this phenomenon -- of expectations aroused but unfulfilled -- has cut across the much exaggerated rural-urban divide."

outcomes as well as lags in the observation of the changes taking place. In contrast, the electorate has had enough opportunity to observe a party that ruled for several years until a little more than a year or less prior to the national elections in April-May 2009.

India has 28 states and 7 Union Territories (UTs) in all. Among the UTs, only Delhi has its proper local administration with its own Chief Minister. The remaining UTs are administered by the centre. Therefore, we include Delhi as a "state" in our sample while excluding the remaining six UTs from the analysis. Among the states, the eight northeastern states have a special status with deep involvement of the centre in their development process. Likewise, special circumstances apply to the state of Jammu and Kashmir. Therefore, we exclude these nine states from our sample. Finally, two states, Karnataka and Jharkhand, have had multiple changes in the state governments during the relevant period, making the choice of the incumbent government arbitrary. Therefore, we drop them from the sample as well. This leaves us with a total of 18 states where Delhi is counted as a state. These states account for 422 out of the total of 543 parliamentary seats across the country.

Table A1 in the appendix lists the 18 states (*column 1*) included in our sample. Alongside, it also lists the incumbent party or parties (*column 2*), year in which the incumbent party came to power (*column 3*) and the years during which it ruled prior to 2009 (*column 4*). Our benchmark case relies on the growth rates calculated during these years and are shown in *column 6*.[3] But for robustness check, we carry out two alternative calculations. First, we calculate the growth rates over a modified set of years that allows for the inclusion of a year when the party was in power for at least half of that year and of the years since 2004 during which the party ruled the state as a part of a prior term. These years and the associated growth rates are shown in *columns 5* and *7* of *Table A1*, respectively. Second, we restrict our growth rate calculations to only 2007 and 2008 regardless of the year in which the party came into power. These growth rates are shown in *column 8* of *Table A1*. Including the benchmark case, we thus calculate the growth rates in three different ways as shown in *columns 6, 7* and *8* of *Table A1*.

For each set of growth calculations, we divide the 18 states into three categories exhibiting low, medium, and high growth rates. We define the low, medium and high growth states in three alternative ways. First, we arrange the 18 states in declining order of the average growth rate and define the top one third states as high growth states, the bottom third of the states as low growth states, and the remaining ones medium growth states. Second, we define the states below the median growth rate as low growth states and those above it the high growth states. In this categorisation, we eliminate the medium growth category. Finally, we define the bottom five states as low growth states, the top five states as high growth states, and the middle eight states as the medium growth states.

[3] Growth rates correspond to the closest fiscal year which runs from April-March in India. Thus the growth rate for, 2.g. 2008 refers to growth during the fiscal year 2009, which runs from April 2008-March 2009.

Table 1: Simple Average of Percentage Seats Won by the Candidates of the Incumbent Parties in each Growth Category

		Low	Medium	High
Growth rates over precise incumbency period	States divided into top, middle, and bottom one third each	36	54	90
	Above and below median	42		78
	Top five, bottom five, and middle states	39	53	92
Growth rates over slightly more encompassing years	States divided into top, middle, and bottom one third each	50	46	84
	Above and below median	44		75
	Top five, bottom five, and middle states	44	55	83
Growth rates over 2007 and 2008 only	States divided into top, middle, and bottom one third each	47	48	84
	Above and below median	50		69
	Top five, bottom five, and middle states	46	53	86

We thus, have three ways in which we calculate the growth rates and three ways in which we define low, medium, and high growth category states, yielding nine alternative ways to compare the election outcomes in high, medium, or low growth rate. In each case, we calculate the simple average of the percent of candidates of the incumbent parties winning elections within each growth category of states. The results are shown in *Table 1*.

It is evident from the pattern in *Table 1* that no matter how we define the period of incumbency for the purpose of calculating growth rates or how we choose the dividing line between low, medium, and high growth states, candidates of the incumbent party do better in high growth states than those in medium- and low-growth states. Moreover, with one exception, medium-growth states consistently do better than low-growth states. Under every classification, 69 percent or more of the candidates of the incumbent parties in high growth states win elections. Maximally, the percentage reaches 92. In contrast, the best the candidates of the incumbent parties in low growth states do is to win 50 percent of the seats. High growth seems to confer a distinct advantage on the candidates of incumbent parties. In the remaining part of the paper, we subject this basic result to a more careful quantitative assessment.

3. Justifying an Aggregate Equation in Multiple-candidates Setting

In his pioneering paper on growth and election outcomes, Fair (1978) identifies two theories of voter behaviour. In the first theory, which according to Gerald H. Kramer (1971) appears in classical democratic theory and also resembles the view of George J. Stigler (1973), the voter evaluates the current pronouncements and past performances of the competing parties and uses these evaluations to form her expected utility under each party. She then votes for the party under which her expected utility is maximised. In the second theory, stressed by Kramer (1971), a voter votes for the incumbent party if its performance by some metric has been satisfactory but against it otherwise. In this latter case, the voter does not evaluate the performance of the parties other than the incumbent party at all.

Fair provides a formalisation of the first theory, which encompasses the second theory as a special case. This theory provides a neat basis of estimation of a single aggregate equation of the proportion of votes received by the incumbent as a function of the relative performance evaluations of the competing parties. From our perspective, the theory has one important limitation, however: it applies to situations involving only a direct contest between two parties or candidates. While the theory works well for the problem of the United States presidential elections on which Fair focuses, it proves inadequate for us because none of the contests represented in our data has less than three candidates.

It turns out, however, that it is possible to extend the Fair model to three or more candidates provided we restrict ourselves to the second of the two models mentioned above, which Kramer emphasises. This extension allows us to derive an aggregate equation for the proportion of votes received by the incumbent party, which is precisely what we are concerned with. In the following, we undertake this task of extending the special case of the Fair model in which the voter collects information on the incumbent party alone and decides to vote for or against it.

Consider a potential voter i in constituency c. For simplicity of exposition, we assume that the only "performance" related information the voter gathers relates to the growth rate in the state in which the constituency is located relative to the average national growth rate. Information gathered along any other dimensions can be incorporated in a straightforward fashion. The voter also attaches a prior utility to each candidate including that of the incumbent party that is invariant to any present or past performance variables.

We let candidate 1 denote the candidate of the state incumbent party throughout. Other candidates are denoted 2, 3, etc. We hypothesise that the expected utility of voter i from choosing candidate 1, 2, 3, … etc in constituency c is

(1) $U_{ci}^{1} = \sigma_{ci}^{1} + \beta_1(g_c - g^*) + \beta_2 D_N$

(2) $U_{ci}^{2} = \sigma_{ci}^{2}$

(3) $U_{ci}^{3} = \sigma_{ci}^{3}$

The σ_{ci}^{j} (j = 1, 2, 3, …) represent the voter's measure of utility from electing candidate j independently of performance or other considerations (based on personality, caste, and other considerations). We index candidates 2, 3, … in the declining order of

the σ_{ci}^{j} (j = 2, 3, …). This ranking may vary across voters. Therefore, it is important to remember that indexes 2, 3, … etc do not identify specific candidates but are generically the most to least liked candidates by voter i from amongst candidates other than 1.

Variables g_c and g* stand for the growth rate in the constituency (represented by that in the state in our case) and the average growth rate across all constituencies (the national average growth rate). Therefore, the higher the growth rate the party has delivered during its incumbency period, the more is the voter favourably inclined towards the candidate of the incumbent party. D_N is a dummy variable that takes a value of 1 if candidate 1 also belongs to the national incumbent party, and zero otherwise. This term is introduced to illustrate how we could enrich the basic model by incorporating alternative determinants of the voter behavior. We can include the impact of candidate 1 belonging to another party (e.g., the national opposition party) in a similar fashion. The voter votes for the candidate under whose regime she expects to receive the highest utility. Subtracting (2) from (1), we have:

$$(4) \qquad U_{ci}^{1} - U_{ci}^{2} = \beta_1(g_c - g^*) + \beta_2 D_N - [\sigma_{ci}^{2} - \sigma_{ci}^{1}] \equiv k_c - \alpha_{ci}$$

Here we define

$$(5a) \qquad \alpha_{ci} \equiv \sigma_{ci}^{2} - \sigma_{ci}^{1} \text{ and}$$

$$(5b) \qquad k_c \equiv \beta_1(g_c - g^*) + \beta_2 D_N$$

Parameter α_{ci} is a measure of the voter's bias against candidate 1 relative to candidate 2 on the basis of considerations other than those we explicitly incorporate in k_c. Note that k_c is constant for a constituency. In particular, it is independent of voter i. Thus, we are assuming that all voters within constituency c value the growth advantage of the state and the association of the state incumbent party candidate to the national incumbent party equally.

Voter i votes for or against candidate 1 as $k_c - \alpha_{ci}$ is positive or negative (we ignore the borderline case). Formally, we can record her vote as:

$$(6) \qquad V_{ci}^{1} = 1 \text{ if } k_c > \alpha_{ci}$$
$$V_{ci}^{1} = 0 \text{ if } k_c < \alpha_{ci}$$

That is to say, voter i votes for candidate 1 if and only if growth and other favourable effects more than offset her initial bias against the latter.

The final step is to determine the proportion of votes going to candidate 1, the candidate of the incumbent party. Assume that α_c, the bias against the candidate of the incumbent party relative to the next best candidate, is uniformly distributed between $a+\delta_c$ and $b+\delta_c$ where a is negative and b is positive. Note that a and b are the same across constituencies with only δ_c varying. The problem is now entirely identical to the one solved by Fair (1978).

Therefore, the distribution of voters above corresponds to that in *Figure 1* in Fair (1978). The lower the value of δ_c, the more the voters are inherently favourably inclined toward candidate 1 in constituency c. The probability density function and cumulative

density function of α (with subscript c dropped) are given in equations (7a) and (7b), respectively, below:

(7a) $$f_c(a) = \frac{1}{b-a} \quad \text{for } a + d_c < a < b + d_c$$

$f_c(\alpha) = 0$ otherwise

(7b) $F_c(\alpha) = 0$ for $\alpha < a + \delta_c$

$$F_c(a) = \frac{a - a - d_c}{b-a} \quad \text{for } a + d_c \le a \le b + d_c$$

$F_c(\alpha) = 1$ for $\alpha > b + \delta_c$

Let V_c^1 denote the percent of votes received by candidate 1 in constituency c. V_c^1 equals the probability that α is less than or equal to k_c. If k_c is halfway between $a+\delta_c$ and $b+\delta_c$, half of the voters vote for candidate 1 and the remaining half for one of the remaining ones. The probability that α is less than or equal to k_c is simply the value of the cumulative density function at k_c. Therefore,

(8) $$V_c^1 = -\frac{a}{b-a} + \frac{k_c}{b-a} - \frac{d_c}{b-a}$$

Or, substituting from (5b) and redefining the fractions in the above appropriately, we can rewrite (8) as

(8') $V_c^1 = \mu_0 + \mu_1\beta_1(g_c - g^*) + \mu_1\beta_2 D_N + \mu_c$

The last term may be interpreted as representing the characteristics of the incumbent candidate such as age, sex, education, wealth and pending criminal charges, if any.

A diagrammatic interpretation of the above may be given as follows. Normalise the total number of voters to 1 and arrange voters from the one with greatest inherent bias in favour of candidate 1 to that with the lowest bias; i.e., in the declining order of $-\alpha_{ci}$ ($= \sigma_{ci}^1 - \sigma_{ci}^2$). The curve labeled $-\alpha_{ci}$ in *Figure 1* shows this relationship. Absent growth and other effects, voters up to point A will vote for candidate 1. The rest would vote for one of the remaining candidates. This may or may not be sufficient to win the election. Adding the advantage conferred by growth and national incumbency (we assume it to be positive for the specific constituency considered in *Figure 1* above), candidate 1 gets votes up to B, which may give him or her the winning votes.

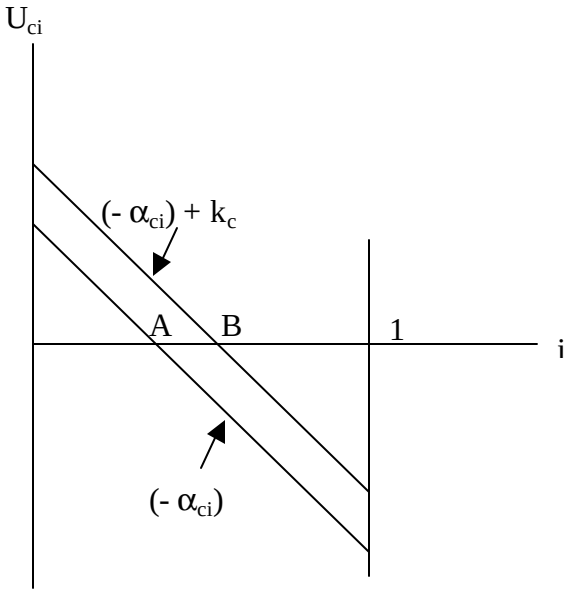

Figure 1: Determining the proportion of votes received by the candidate of the state incumbent party

Note that if votes up to point A are sufficient to win, the election outcome is unchanged by the growth advantage but voter margin is still impacted by it. Likewise, if votes up to B lead to a loss, the outcome is once again unaffected by growth though the voter margin is. These facts lead to the conclusion that if equation (8') is estimated with the dependent variable assigned values of 0 and 1 for defeat and victory, respectively, versus the proportion of votes received, the fit will be tighter in the latter case. The reason is that in cases of victory, when votes up to point A in *Figure 1* are sufficient, growth adds nothing to the outcome when the dependent variable is 1 or 0. But it will add to the outcome if the dependent variable is the proportion of votes received. Symmetrically, in cases of defeat, if votes up to B lead to a loss, no impact of growth will be observed when the dependent variable is 1 or 0. But not so when it is the proportion of votes received.

4. Estimation

We now proceed to estimate equation (8') using data on candidates nominated by state-level incumbent parties. As previously mentioned, we restrict the sample to 18 large states, which account for 422 out of the grand total of 543. A unique feature of our analysis, not present in any others to our knowledge, is that we also control for candidate specific characteristics relating to age, gender, wealth, education and pending criminal cases. Under the current election laws in India, all candidates contesting an election for the Lok Sabha, Rajya Sabha, or state assemblies are required to file an affidavit with the Election Commission of India containing information on these characteristics. We painstakingly collected this information and classified the raw data on each of wealth,

education, and pending criminal cases into five categories assigning them values from 0 to 4. In each case, 0 represents the lowest category and 4 the highest, as discussed in *Table A2* in the *Appendix*. *Table A2* in the *Appendix* provides the data sources from where the data have been extracted, and *Table A 3* provides the summary statistics of these variables.

We first estimate the proportion of votes received by the candidate of the incumbent party as a function of the relevant variables using our benchmark average growth rates, which relate precisely to the period of incumbency and explicitly shown in *column 4* of *Table A1* in the *Appendix*. *Table 2*, reports the results. In the first four columns, we estimate linear regressions with percentage of votes being the dependent variable and in the last two columns we estimate logit regressions, in which our dependent variables take values of 1 and 0 depending on victory or defeat of the candidate of the incumbent party, respectively.

In *column I* of *Table 2*, we estimate the basic model that includes only three independent variables: log per capita income at the level of the state in 2003 to control for omitted state specific variables; a dummy representing membership in the Congress, the main incumbent party at the centre; and the average growth in the Gross State Domestic Product calculated over the period coinciding with the incumbency period. Results show that the candidates proposed by the state incumbent party receive higher share in the total votes, the higher the growth rate. Each additional percentage point in growth adds 1.4 percentage points to the vote share of the incumbent candidate. This is clearly a very substantial effect and, in an election with many candidates, can have a decisive effect on the outcome.

Table 2: Growth and Election Outcomes

	I	II	III	IV	V	VI
Dependent variable	Dependent variable is the percent of votes received by the candidate of the incumbent party				Dependent variable is 1 if the candidate of incumbent party wins election; 0 otherwise	
Log per capita income, 2003	14.7***	14.2***	10.0***	21.5***	0.12	0.1
	[11.60]	[10.77]	[9.37]	[8.39]	[1.58]	[1.32]
Dummy for Congress party	-6.9***	-7.5***	-6.5***	-17.5***	0.23***	0.19**
	[-5.88]	[-5.76]	[-5.73]	[-4.24]	[3.13]	[2.41]
Growth of state under the incumbent	1.43***	1.46***		2.13***	0.05***	0.06***
	[6.63]	[6.57]		[7.21]	[4.48]	[4.51]
Dummy=1 if high growth state (-1 if low growth, 0 if medium growth)			5.18***			
			[7.97]			
Age		-0.01	-0.01	-0.01		0
		[-0.28]	[-0.27]	[-0.10]		[-1.46]
Gender		0.77	0.88	0.11		0.16*
		[0.39]	[0.44]	[0.04]		[1.86]
Wealth index		-0.09	0.22	-0.33		0.03
		[-0.22]	[0.53]	[-0.52]		[1.17]
Education Index		0.68	0.7	0.26		0
		[1.34]	[1.42]	[0.40]		[0.03]
Criminal index		-0.42	-0.32	-0.14		0.01
		[-0.62]	[-0.50]	[-0.16]		[0.25]
Dummy for serious criminal case		0.43	0.44	-0.02		-0.04
		[0.28]	[0.30]	[-0.01]		[-0.30]
Dummy for incumbent candidate		2.13**	1.94**	2.35*		0.04
		[2.11]	[2.00]	[1.69]		[0.74]
Observations	422	409	409	248	422	409
R-squared	0.244	0.249	0.283	0.293	0.09	0.11

Note: *, **, *** indicate that the coefficients are significant at 10, 5, and 1 percent levels respectively. Robust t statistics are given in parentheses. Marginal effects from logit regressions are presented in columns V and VI.

The addition of candidate characteristics in column II has virtually no impact on the contribution growth makes to the vote share: the coefficient rises from 1.43 to 1.46 with no change in the level of statistical significance. In column III, we divide the states into three groups based on the growth rate: low, medium, and high. We define a variable that takes a value -1 when the state is in the low-growth category, 0 if it is in the medium growth category, and 1 if it is in the high growth category. We replace this variable for the growth rate in Column III. The results now look more dramatic: they show that a candidate of the state incumbent party in a medium growth state gets a 5.18 percent larger vote share than a candidate in the low growth state and similarly a candidate in a high growth states gets a 5.30 percent larger vote share than a candidate in a medium growth state. Finally in order to sharpen the results, we limit our sample to only the low

and high growth states and drop the middle third of the states from the sample. The coefficient of the variable of interest, the growth rate in the state, in column IV now turns much larger.

In the remaining two columns in *Table 2*, we estimate logit regressions, using the dummy for winning elections as the dependent variable. In *column V*, per capita income and a dummy for Congress party are the only other controls in the regressions; and in *column VI* we include the candidate characteristics as additional control. Results show that an increase in pre election growth by 1 percent point increases the probability that a candidate of the state incumbent party wins election by 5 to 6 percentage points. Candidate characteristics are generally not statistically significant.

As seen in *Table 2*, and we will further see it in *Table 3* and *4*, the number of observations fluctuates across regressions. While our sample consists of 422 candidates, the regressions that include candidates' characteristics are estimated with fewer observations principally because the data for education is missing for about 13 observations. Out of these 13 observations, data for wealth is missing for 1 observation. In addition, data is missing for fiscal deficit for Goa for 2008-09. Thus when we include the full set of candidate characteristics we can estimate the regressions with 409 observations and when we include fiscal deficit variable as well there are 408 observations. As a robustness test, we estimate all of our regressions with the smallest sample of 408 observations and none of the results change.

Our next step is to check if the effect of growth on election outcomes varies according to per capita income of the state, affiliation with the Congress party and candidate incumbency at the centre. The introduction of interaction terms between the average growth of the state during incumbency on the one hand and the state per capita income, dummy for membership in the Congress and the dummy for incumbency in the Parliament in columns I, II and III in *Table 3* accomplishes this task.

A key result from columns I to III in *Table 3* is that the incumbent state government's candidates benefit from growth more the lower the per-capita income in the state. This result follows from the fact that the coefficient of the interaction between growth during the incumbent's regime and per capita income is negative and statistically significant in all three columns. This is quite a remarkable result: voters in the poorer states value a given growth rate more than those in richer states. The results in columns II and III also show that the growth dividend is larger for the candidates of the Indian national congress since the coefficient of the relevant interaction term is positive and significant. This result suggests some synergy between incumbency at the state and central level when the state government performs well. Finally, the sitting MPs reap no additional growth dividend as shown by the coefficient of the relevant interaction term being statistically insignificant.

Table 3: Including the Interaction Effects and Fiscal Deficit

	I	II	III	IV	V	VI
Log per capita income, 2003	20.8***	25.0***	25.1***	15.6***	15.3***	24.7***
	[6.29]	[7.00]	[6.87]	[13.00]	[12.13]	[6.72]
Dummy for Congress party	-6.17***	-36.5***	-36.5***	-6.7***	-7.4***	-30.2***
	[-4.27]	[-4.02]	[-4.02]	[-5.72]	[-5.78]	[-3.15]
Growth of state under the incumbent	8.1***	13.6***	13.6***	1.4***	1.4***	12.1***
	[2.61]	[3.71]	[3.65]	[6.41]	[6.38]	[3.23]
Change in state fiscal deficit (2008-07)				-1.59***	-1.54***	-1.16**
				[-3.03]	[-2.80]	[-2.06]
Growth Variable*log per capita income	-0.73**	-1.35***	-1.35***			-1.18***
	[-2.17]	[-3.38]	[-3.30]			[-2.88]
Growth variable*dummy for congress		3.43***	3.43***			2.71**
		[3.24]	[3.24]			[2.44]
Growth variable*dummy for incumbent candidate			0.03			0.04
			[0.07]			[0.08]
Age	-0.02	-0.01	-0.01		-0.02	-0.02
	[-0.44]	[-0.30]	[-0.30]		[-0.39]	[-0.39]
Gender	0.78	0.8	0.8		0.55	0.62
	[0.40]	[0.41]	[0.41]		[0.28]	[0.32]
Wealth index	-0.1	-0.19	-0.19		0.14	0
	[-0.24]	[-0.45]	[-0.46]		[0.33]	[0.00]
Education Index	0.71	0.66	0.66		0.58	0.6
	[1.41]	[1.33]	[1.33]		[1.15]	[1.21]
Criminal index	-0.47	-0.28	-0.27		-0.35	-0.26
	[-0.70]	[-0.41]	[-0.41]		[-0.52]	[-0.39]
Dummy for serious criminal case	0.72	0.56	0.55		0.28	0.46
	[0.46]	[0.36]	[0.36]		[0.18]	[0.30]
Dummy for incumbent candidate	2.18**	2.04**	1.8		1.89*	1.59
	[2.16]	[2.03]	[0.50]		[1.84]	[0.44]
Observations	409	409	409	421	408	408
R-squared	0.26	0.27	0.27	0.26	0.26	0.27

Note: *, **, *** indicate that the coefficients are significant at 10, 5, and 1 percent levels respectively. Robust t statistics are given in parentheses.

In the last three columns of *Table 3* we include the change in the state fiscal deficit, as a percentage of state gross domestic product, in 2008 over 2007 in the benchmark regressions considered in *Table 2*. Results in column IV, V and VI show that an increase in fiscal deficit in the election year is associated negatively with the vote share for the incumbents. There remains the possibility of reverse causality here since the incumbent parties expecting to lose may well choose to increase spending in a last-ditch effort prior to the election. This result mirrors one of the results in Brender and Drazen.

We next conduct robustness checks by adjusting the period over which the growth rates associated with incumbency are calculated. In column I, we reproduce the

benchmark case when the growth rate is calculated over the exact years of incumbency for each state. In *column II*, we choose a longer period as shown in column 5 of *Appendix Table A1*. Finally, in column *III*, the growth rate is the average of the growth rates in 2007 and 2008. The last of these cases is in the spirit of Kramer who argues that the collection of information is costly so that voters take into account the economic performance only during the years immediately preceding the elections.

In *columns IV* and *V* of *Table 4*, we replace the absolute growth rate of the state by its deviation from the national average during the years identified with incumbency in each case. None of the variations in *Table 4* change our basic results. We also note that replacing the average of growth rates during 2007 and 2008 by its deviation from the national average will not alter any of the results since the common average growth rate would simply be absorbed by the constant term.

Table 4: Including Different Measures of Growth

	I	II	III	IV	V
Log per capita income, 2003	14.2***	12.4***	13.1***	12.9***	12.9***
	[10.77]	[10.95]	[12.03]	[9.62]	[10.76]
Dummy for Congress party	-7.45***	-4.51***	-4.78***	-5.29***	-5.49***
	[-5.76]	[-3.99]	[-4.28]	[-4.50]	[-4.81]
Growth (exact incumbency years)	1.46***				
	[6.57]				
Growth (longer period, column 5, Table A1)		1.39***			
		[6.67]			
Growth (2007 and 2008 only)			2.02***		
			[7.55]		
State's growth minus national growth over the exact years of incumbency				1.18***	
				[4.59]	
State's growth minus the national growth over the longer period (column 5, Table A1)					1.44***
					[6.11]
Age	-0.01	-0.01	-0.01	-0.01	-0.01
	[-0.28]	[-0.29]	[-0.29]	[-0.12]	[-0.21]
Gender	0.77	0.93	0.75	0.97	0.97
	[0.39]	[0.48]	[0.39]	[0.49]	[0.49]
Wealth index	-0.09	-0.14	0.03	-0.25	-0.22
	[-0.22]	[-0.33]	[0.06]	[-0.57]	[-0.53]
Criminal Index	-0.42	-0.48	-0.02	-0.21	-0.41
	[-0.62]	[-0.71]	[-0.04]	[-0.29]	[-0.60]
Education Index	0.68	0.85*	0.79	0.74	0.86*
	[1.34]	[1.69]	[1.56]	[1.44]	[1.69]
Dummy for serious criminal case	0.43	0.29	-0.52	-0.27	0.1
	[0.28]	[0.20]	[-0.36]	[-0.17]	[0.07]
Dummy for incumbent candidate	2.13**	2.37**	2.02**	2.17**	2.40**
	[2.11]	[2.31]	[2.00]	[2.04]	[2.31]
Observations	409	409	409	409	409
R-squared	0.249	0.251	0.253	0.204	0.242

Note: *, **, *** indicate that the coefficients are significant at 10, 5, and 1 percent levels respectively. Robust t statistics are given in parentheses.

Without reporting the detailed results, we note here that we also checked for several additional variables that may impact the outcomes but our key results remain unaffected. For example, we interact the growth variable with various constituency specific variables such as the literacy rate, % of population below the poverty line, % of rural population and the % of workforce in the primary sector (agriculture and mining and quarrying). We also introduce dummy variables for constituencies reserved for the scheduled castes and scheduled tribes, and their interactions with growth variables. The results turn out to be statistically insignificant for all these variables except literacy, which is somewhat difficult to interpret. Moreover, literacy is also highly correlated with per capita income as reflected in the fact that its inclusion turns per capita income variable insignificant.

Our final robustness checks relate to replacing characteristics of the candidate of the incumbent party by the deviations of these characteristics from those of the average of the characteristics of the top four candidates out of the remaining ones. In this exercise, the interpretation of age is straightforward. For other variables such as education, wealth, and pending criminal cases, we employ the index of the candidate of the incumbent party minus the average of the index value for the top four candidates other than the candidate of the state incumbent party. For the dummy for serious charges, the average is taken over the candidates who have at least one charge. Results show that the coefficient of the growth variable is robust to these modifications. In some cases, the candidate characteristics variables, when taken in the deviation form, turn significant. These include, age, wealth and education. In the deviation form, all of these variables have a positive and significant coefficient, implying that the candidates of the incumbent state government parties who are older than the other top candidates, are wealthier or more educated are able to attract a larger vote share.

5. Concluding Remarks

This paper provides the first example of a developing country in which growth has statistically significant and quantitatively larger impact on the election prospects of the candidates of the incumbent party. The finding is plausible since it is precisely in the poor countries that the masses are likely to react to the gains from high levels of growth. It is also consistent with and reinforces the finding in Brender and Drazen that in a cross-country analysis, growth helps the incumbent heads of states to win re-election.

We note that our finding has also been reflected in some recent key state-level elections. Chief Ministers of such poor states as Bihar and Orissa, who have catalysed extremely rapid growth, have been returned to office with overwhelming majorities. On the other hand, the Marxist government in West Bengal, which ruled the state for over two decades and had seemed invincible, was recently handed a humiliating defeat by the electorate in recognition of its poor delivery in relation to many other states and the national average.

Finally, we note a possible qualification to our finding. We cannot rule out the possibility that growth is correlated with other attributes that the voters value. Superior growth performance, for instance, may accompany good governance including law and order to which voters attach greater value than growth itself. Rapid growth may also be

associated with larger reductions in poverty, which may be a vote winner. Therefore, it is possible to argue that the voters may be rewarding delivery on other attributes rather than growth. We believe, however, that from the policy perspective, this is not a serious issue. Even if the other attributes are what the voters value and not growth *per se*, the latter can serve as a reasonable target variable for the state politicians to win the elections.

References

Alesina, A. and, H. Rosenthal,1989. "Moderating Elections," NBER Working Papers 3072.

Bhagwati and Panagariya, 2004. "Great Expectations", *Wall Street Journal*, May 24, 2004.

Brender, Adi and Allan Drazen, 2008. "How Do Budget Deficits and Economic Growth Affect Reelection Prospects?

Evidence from a Large Panel of Countries," *American Economic Review*, 98(5); 2203–2220.

Fair, Ray C., 1978. The Effect of Economic Events on Votes for Presidents, The Review of Economic and Statistics, LX(2); 159-173.

Gupta, Poonam and Arvind Panagariya, 2011. "Economic Reforms and Election Outcomes," in Bhagwati, Jagdish and Arvind Panagariya, (eds.), *India: Trade, Poverty, Inequality and Democracy*, New York: Oxford University Press (forthcoming).

Kaare Strom and Lipset Seymour M, 1984, "Macroeconomics and Macropolitics: The Electoral Performance of Democratic Governments." Paper presented at the Annual Meeting of the American Political Science Association, Washington, D.C.

Kramer, Gerald H. 1971, "Short Term Fluctuations in U.S. Voting Behavior, 1896-1964, *The American Political Science Review* 65; 131-143.

Lewis-Beck, S Michael, 1988. *Economics and Elections: The Major Western Democracies*. Ann Arbor:University of Michigan Press.

Paldam, Martin, 1991. "How Robust Is the Vote Function? A Study of Seventeen Nations over Four Decades." In *Economics and Politics: The Calculus of Support*, H. Norpoth, M. S. Lewis-Beck, and J.-D. Lafay (*eds.*), Ann Arbor: University of Michigan Press(pp. 9–31).

Powell, Jr., G. Bingham, and Guy D. Whitten, 1993. "A Cross-National Analysis of Economic Voting: Taking Account of the Political Context." *American Journal of Political Science* 37(2); 391–414.

Stigler, George J. 1973. "General Economic Conditions and National Elections", *The American Economic Review* 63; 160-167.

Appendix Table A1: Incumbency Years and Average Growth Rates Across States

State	Year of Incumbency	Main Incumbent Party	I: Growth rate averaged over the years	II: Growth rate averaged over the years	Average growth rate in case I	Average growth rate in case II	Average growth rate in 2007-08
1	2	3	4	5	6	7	8
Andhra Pradesh	2004	Indian National Congress	2005-2008	2005-2008	9.30	9.30	7.90
Bihar	2005	JDU, Bhartiya Janata Party	2006-2008	2006-2008	15.96	15.96	12.68
Chhattisgarh	2003	Bhartiya Janata Party	2004-2008	2004-2008	9.69	9.69	9.26
Delhi	2003	Indian National Congress	2004-2008	2004- 2008	12.17	12.17	11.45
Goa	2007	Indian National Congress	2008	2004-2008**	11.14	10.76	11.14
Gujarat	2007	Bhartiya Janata Party	2008	2004-2008**	7.21	10.22	9.85
Himachal Pradesh	2007	Bhartiya Janata Party	2008	2008	7.44	7.44	8.01
Haryana	2005	Indian National Congress	2006- 2008	2006- 2008	10.14	10.14	8.72
Kerala	2006	Communist Party of India, Marxist	2007-2008	2006- 2008*	8.39	9.12	8.39
Maharashtra	2004	Indian National Congress, National Congress Party	2005- 2008	2004-2008**	8.77	8.76	6.74

Appendix Table A1: Incumbency Years and Average Growth Rates Across States (contd)

State	Year of Incumbency	Main Incumbent Party	I: Growth rate averaged over the years	II: Growth rate averaged over the years	Average growth rate in case I	Average growth rate in case II	Average growth rate in 2007-08
1	2	3	4	5	6	7	8
Madhya Pradesh	2003	Bhartiya Janata Party	2004- 2008	2004-2008	6.62	6.62	7.66
Orissa	2004	Biju Janata Dal	2005- 2008	2004-2008**	9.43	10.18	8.93
Punjab	2007	Siromani Akali Dal	2008	2007-2008*	6.40	6.64	6.64
Rajasthan	2003	Bhartiya Janata Party	2004- 2008	2004-2008	6.88	6.88	7.84
Tamil Nadu	2006	Dravida Munnetra Kazhagam	2007-2008	2006-2008*	4.48	6.75	4.48
Uttarakhand	2007	Bhartiya Janata Party	2008	2007- 2008*	5.83	8.07	8.07
Uttar Pradesh	2007	Bajuhan Samaj Party	2008	2007-2008*	7.21	7.58	7.58
West Bengal	2006	Communist Party of India, Marxist	2007- 2008	2004-2008**	7.50	7.33	7.50

*Election were held in March/May 2006, hence we include growth rate in 2006
** The same party was in the government in the previous term, hence the average calculated over five years.

Appendix Table A2: Description and Data Sources of Variables

Variable	Source	Description
% of Votes Obtained	Election Commission	
Per Capita Income, Log	Central Statistical Organization	
Growth in State Domestic Product	Central Statistical Organization	The growth rates are calculated using the GSDP data at 1999-2000 prices, from the CSO's website, accessed on September 14, 2011.
Change In Fiscal Deficit		Fiscal deficit of state is measured as percent of state domestic product. The change is in the value of this variable in FY 2008-09, over 2007-08
Age	Election Commission	In years
Gender dummy	Election Commission	Dummy takes a value 1 if the candidate is a female
Education Index	Election Commission	The index takes a value 0 if the candidate declared wealth is upto ½ million rupees, 1 if it is between ½ and 5 million rupees, 2 if the wealth is between 5 and 9 million rupees, 3 if it is between 9 and 50 million rupees and 4 if it is more than 50 million rupees.
Wealth Index	Election Commission	The index takes a value 0 if the candidates has no formal education, 1 if he has formal education till grade 5; 2 if the education is up to high school; 3 if education is up to undergraduate; and 4 for education level higher than undergraduate, including a technical or professional degree.
Criminal index	Election Commission and Association for Democratic Reforms	The index takes a value 0 if the candidate has no criminal cases against him, 1 if he has 1 criminal case against him, 2 if he has 2-4 cases against him, 3 if he has 5-9 cases against him and 4 if he has more than 9 cases against him.
Dummy for Serious cases	Association for Democratic Reforms	Dummy which takes a value 1 if the candidate faces at least one serious criminal charge under sections 302, 307, 364, 379 and other sections, levied for charges such as murder, intent to murder and theft.
Incumbent MP	Various sources on the web	Dummy which takes a value 1 if the candidate was a member of the previous Lok Sabha.
Belonging to India National Congress (INC)	Election Commission	Dummy which take a value 1 if the candidate belonged to India National Congress Party

Appendix Table A3: Summary Statistics of Variables

Variable	Observations	Average	Minimum	Maximum
Percent of Votes Obtained	422	39.06	0.54	78.80
Per Capita Income, Log	422	9.75	8.82	10.81
Belonging to INC	422	0.20	0	1
Age	422	52.40	28	88
Gender Dummy	422	0.10	0	1
Wealth Index	421	2.38	0	4
Education Index	409	3.22	0	4
Criminal Index	422	0.46	0	4
Dummy for Serious cases	422	0.12	0	1
Incumbent MP	422	0.37	0	1
Growth (exact incumbency years)	422	8.56	4.48	15.96
Growth (longer period, column 5, Table A1)	422	8.83	6.62	15.96
Growth (2007 and 2008 only)	422	8.21	4.48	12.68
Change in state fiscal deficit (2008-07)	421	1.08	-0.34	4.46