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Effect of Information on Voter Turnout: Empirical Evidence from Assembly Elections in India

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Abstract:
This paper explores the importance of information in determining voter turnout by using Vidhan Sabha electoral data from the 14 major states of India during the period 2001-02 to 2020-21. As per the Indian constitution, citizens of age 18 and above are eligible for voting. Why voters should cast vote? Is the act of voting rational? It is not expected that a voter casts his vote only for getting material benefit as a single vote cannot change the overall outcome of an election. It is true that some voters cast their votes for maintaining their duties as a citizen. In India, there is an upward trend of voter turnout over time. So there are some other reasons that influence voter turnout. In this context, this paper measures the role of various determinants of voter turnout. Broadly, the literature on voter turnout can be divided into two groups – one is Rational voter model and another is Information theory. These theories provide the rationale for including the determinants of voter turnout and explain the reasons behind voter turnout. The important determinants that are considered in the paper: closeness of the election, the number of parties in the electoral landscape, and the availability of information to voters. This paper specifically focuses on the role of information in explaining voter turnout in assembly elections of selected Indian states. In the analysis, five important information variables are considered: circulation of newspaper, literacy rate, ownership of television, ownership of radio and transistor, and penetration of telephone. The principal findings of the paper are as follows. First, the effective number of parties in a legislature has a negative impact on voter turnout. This result validates the theory that an increase in the effective number of parties magnifies information cost which may reduce a voter's incentive to cast her ballot. Second, the effect of the information variables on turnout is direct. Specifically, the ownership of television and the ownership of radio and transistor significantly increase voter turnout. These results are robust across various specifications used in the empirical analysis. In sum, a substantial amount of variation in the voter turnout is explained by the effective number of parties and the availability of information to an individual. Moreover, the effects of the information variables are more prominent in the southern states compared to other parts of India.

Keywords: Information, election / voter turnout, media, closeness, effective no. of parties

1. Introduction

Voter turnout is an important aspect of political economy literature. A substantial portion of literature focusing on voter turnout deals with reason and implication of decline in voter turnout in Western countries. While voter turnout has declined in the many Western democracies, it has actually increased

in India - World's largest democracy. This upward trend has been highlighted by scholars as an important factor for the sustenance of Indian democracy. Figure I shows the evidence of upward trend in voter turnout in India.

This paper studies the determinants of voter turnout in Vidhan Sabha (i.e. state assembly) elections by using data from the 14 major states[1] of India during the first two decades of 21st century (2001-02 to 2020-21). The impacts of the following factors on voter turnout are explored: closeness of the election, the effective number of parties in the electoral landscape, and the availability of information to voters.

Very few papers address the determinants of voter turnout in developing countries. This is because in most of the developing countries, democracies are not long-standing. So, electoral data are not available for long periods. India, on the other hand, has held elections since 1950 (except for a brief interlude of two years during the emergency of June 26, 1975 to March 21, 1977). Furthermore, electoral data are made publicly available by the Election Commission of India. So, data related constraints do not arise for India. The study of voter turnout in India is interesting for another reason. In established long-standing Western democracies, turnout is highest for the rich and the educated classes. India, on the other hand, provides a clear break from this turnout pattern. Turnout in India is higher amongst the poor and the ill-educated classes. Indeed, Varshney (2000) observes: "the deprived seem to have greater faith in India's election than the advantaged". This paper focuses on turnout at the state-level since Indian states are responsible for providing valuable public goods to its citizens (Chhibber and Nooruddin, 2004). Furthermore, a majority of the political parties in India are organized at the state-level and elections are planned and conducted on a state-by-state basis.

Now, the theoretical arguments that provide reasons for the variation in voter turnout have been summarized. Downs (1957) proposes a 'rational voter model' based on rational choice theory. According to Downs, each person computes the cost of voting and the benefit derived from voting. The person votes only if the benefit exceeds cost. The cost of voting is conceptually straight forward and centers on the resources expended in going to vote (e.g. time, effort, financial cost, and so on). Benefit is nothing but gain in utility that a voter receives if her favored political party or candidate is elected. According to this model, cost exceeding benefit is a more likely outcome and hence voting is an irrational act. So, this model does not provide an adequate explanation for the variation in voter turnout. Riker and Ordeshook (1968) modify the 'rational voter model' by introducing the idea of civic duty' as an additional benefit derived from voting. Even after incorporating 'civic duty' in the model, this model fails to explain the reasons behind voter turnout.

The information theory of voter turnout explains variation in voter turnout by introducing the idea of limited information. One decision-theoretical model developed by Matsusaka (1995) who has implanted an information theory in the standard rational voter model. As per the theory, the probability of turnout increases as the information gathered by an individual increases. If a voter has information about the candidates, the policies that the candidates plan to implement if elected, and the likely consequences of these policies, then the voter casts her vote confidently for the suitable candidate. Uninformed voters are concerned that they may affect the outcome of an election by voting for an inappropriate candidate because of confusion about the identity of the suitable candidate. This lack of confidence provides an incentive to abstain from voting. Another decision-theoretical model developed by Larcinese (2006)

[1] The fourteen major states are as follows: Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal.

who has added one more important factor - prior ideological beliefs about the candidates - current information expands the probability of voting of indifferent voters but reduces that of very ideological voters. Another effort by Feddersen and Pesendorfer (1997; 1999) who incorporate information in a model of voter turnout. According to the model, voting is costless for all agents and hence voting decision depends on the volume of information gathered by the citizens. From the above discussions of theoretical models, it can be said that information plays an important role in taking decision regarding casting vote.

The remainder of the paper is structured as follows. Section 2 briefly outlines the empirical literature on the determinants of voter turnout in developed and developing countries. Section 3 provides a description of the data set used in the analysis of voter turnout in India. Section 4 presents the econometric procedure used and the empirical results (including the robustness of the findings) obtained in the analysis. Section 5 concludes the discussion. Section 6 contains the data appendix.

2. Empirical literature on turnout

This section summarizes the empirical literature on the trends and determinants of voter turnout in the context of both developed and developing countries. It is divided into three parts: Subsection 2.1 describes the empirical literature on turnout in developed countries. Subsection 2.2 briefly outlines the empirical literature on turnout in India. Subsection 2.3 discusses the empirical literature on turnout in other developing countries. It is observed that a considerable volume of work on the trends and determinants of voter turnout is available in developed countries. But, few papers deal with turnout related issues in developing countries.

2.1 Empirical literature on turnout in developed countries

In this subsection, the empirical literature on the determinants of voter turnout in developed countries are discussed. A considerable volume of published work on turnout in developed countries is available but attention has been restricted to the following three major questions addressing voter turnout:

1. Is there any relationship between election closeness and voter turnout?
2. Does the number of effective parties influence voter turnout?
3. How does the availability of information (measured variously) influence voter turnout?

Tollison et al. (1975) analyze the 1970 US gubernatorial election data and find that as elections become tighter, voter turnout increases. By using data from 1982 federal elections and contemporary gubernatorial elections, Cox and Munger (1989) find similar results. However, Kirchgassner and Himmern (1997) explore the German general elections data for the period 1983-1994 and observe that there is no closeness effect for the 1983 election but a significant positive one for the 1987 election. The 1990 election, on the other hand, exhibits an asymmetry: closeness significantly increases voter turnout in West Germany while it lowers turnout in East Germany. For the 1994 election, Kirchgassner and Himmern (1997) find a significantly positive effect in West Germeny and statistically insignificant effect in East Germany. Blais and Dobrzynska (1998) utilize data from 324 democratic national lower house elections held in 91 countries between 1972 and 1995 and observe that as elections get closer, voters turnout in larger numbers. Geys (2006) also obtains the above result in a meta-analysis of 83 aggregate-level studies. By using US presidential electoral data (2000), Mckee (2008) concludes the same. Finally, it should be noted that Matsusaka (1993) analyzes data of California elections from 1912 to 1990 and finds absolutely *no* systematic relation between election closeness and turnout. He concludes that “California voters are not sensitive to the closeness of elections.” Summing up, various

papers inspite of using different data sets, different sets of variables, and different methods conclude that closeness of an election enhances voter turnout.

Jackman (1987) examines voter turnout in 19 industrial democracies for the 1960s and 1970s. His study shows that multi-partyism decreases voter turnout significantly. A study by Jackman and Miller (1995) [2]reach the conclusion that as the number of effective parties increases, voter turnout decreases significantly. Confirmation of the above result is given by Blais and Dobrzynska (1998), Davis and Radcliffe (2000)[3] and Gallego et al. (2009)[4], despite using different data sets. Mention should be made of Endersby et al. (2002) who use data from the Canadian federal elections of 1993 and 1997. Their result does not support the conventional result that effective number of parties and voter turnout are inversely related. Summing up, in most of the studies, effective number of parties significantly decreases voter turnout.

Tollison et al. (1975) get a positive and significant effect of information on voter turnout. By using US presidential election data, Abrams and Settle (1976)[5] and Palfrey and Poole (1987)[6] come to the conclusion that persons with a high level of information are more likely to cast vote. Cox and Munger (1989) report that voter turnout increases with increase in information through education. Parallel results are obtained by Blais and Dobrzynska (1998) and Endersby et al. (2002). Toka (2002) on the basis of survey data on voting behaviour in 18 developed democratic party systems from the comparative Study of Electoral systems and Larry Bartel's (1996) simulation procedure comes to the conclusion that social differences in both turnout and political knowledge may lead to the hypothesized political inequalities but their size is remarkably modest. In an influential study, Gentzkow (2006) finds that introduction of TV in the US causes a major drop in voter turnout. This is because of the fact that due to the introduction of TV, voters switch from newspapers and radio to commercial television which leads to decline in political knowledge. Althaus (2008) explores the impact of television market size on voter turnout in American elections. The author covers four election cycles (1986 to 1990) and nearly every country in the continental United States. The main finding of the paper is that voter turnout is negatively associated with television market size and the relationship is stronger in midterm election years. Sorensen (2019) analyses the impact of state television on voter turnout by using data on the rollout of television in Norway in the 1960s and 1970s combined with municipality-level data on voter turnout over a period of four decades. According to the study, the new TV medium instantly becomes a major source of political information and hence increases political participation. Breux et al. (2022) conclude on the basis of a survey of 3200 electors in the province of Quebee that political information influences voter turnout at the municipal level. Their analysis shows that if a voter is more knowledgeable regarding candidates and their platforms and projects, it is more likely that the voter will cast vote. Baekgaard et al. (2014) report that local news media coverage has a positive effect on voter turnout at local elections in Denmark and beyond it only if the news media provides politically relevant information to the voters. Their findings are consistent with the Information Model of voter turnout developed by Matsusaka (1995) and

[2] Data on 22 industrial democracies over the period 1981-90 are used.

[3] Cross-sectional (1970-1980) and pooled time series (1960-1988) data for 19 industrial democracies and the 50 American states are used.

[4] Spanish data at the regional-level from regional, general, and European elections between 1984 and 2008 are used.

[5] Abrams and Settle (1976) use data for the period 1868-1972.

[6] 1980 electoral data are used.

Feddersen and Pesendorfer (1997; 1999). Summing up, it can be said that information increases voter turnout unambiguously.

2.2 Empirical literature on turnout in India

The empirical literature addressing the determinants of voter turnout in India is limited.

Ghosh (2006) seeks to explain the variation in voter turnout across the Indian states. He uses constituency-level Lok Sabha (national assembly) election data for the period 1967-1998. Consistent with the "calculus of voting" theory, he finds that as elections become more competitive, voter turnout increases.

Diwakar (2008) analyzes the trends and determinants of voter turnout in India at the state-level. He uses the data of the 14 general elections between 1951 and 2004. The empirical results show that as elections become closer and the literacy rate is raised, turnout increases follow. Krishna (2006) looks specifically at the effects of information, education, and gender on democratic participation in rural local governments. He uses survey data from the two Indian states (i.e. Madhaya Pradesh and Rajasthan) during 1999-2000. He finds that as electors become more educated and informed, voter turnout increases.

Rosenberg (2017) explores female voter turnout in India and come to the conclusion that female electoral participation in India increases but it varies regionally depending on an area's social characteristics and culture. Moreover, media platforms including televisions, newspapers, radios, and more have allowed women to readily access information and thus, have likely increased women's political awareness, interest, and voter participation.

Carney (2022) explains on the basis of experimental evidence from Tamil Nadu's 2021 legislative assembly election that whatsApp messages (a platform of social media) increases voter turnout by increasing voter knowledge and improving users' ability to differentiate between true and false news.

2.3 Empirical literature on turnout in other developing countries

The empirical literature addressing the determinants of voter turnout in other developing countries is sparse. Now, focus has been given on four important determinants of turnout: the effective number of parties, the closeness of elections, the education of the electors, and the quality of available information.

Kostadinova (2003) utilizes parliamentary elections (1990-2000) data of 15 East European countries. He reports that the number of parties contesting in post-Communist transitional elections reduces voter turnout. Schraufnagel and Sgouraki (2005) use parliamentary as well as presidential elections (1990-2004) data in 16 countries of Central and South America. Their analysis confirms the aforesaid result. Summing up, multi-partyism lowers voter turnout in developing countries.

Consistent with the "calculus of voting" theory, Kostadinova (2003) observes that closeness of elections enhances voter turnout. Schraufnagel and Sgouraki (2005) examine that nationally competitive district leads to higher voter turnout. Cerda and Vergara (2008) also observe that political competition has positive effect on electoral participation in Chile during 1989-2005. Therefore, closeness of elections significantly raises voter turnout.

Orviska et al. (2005) use Eurobarometer survey data of 10 transitional countries in Central and Eastern Europe to measure the effects of demographic variables on electoral participation. They observe that education has a positive impact on political participation. This result is confirmed by Lesson (2008), who uses survey data from 13 Central and Eastern European countries. Schraufnagel and Sgouraki (2005) find that female literacy rate plays an important role in political participation. However, a contrary result is obtained by Blaydes (2006). Using parliamentary (2000 and 2005) and presidential

(2005) elections data, he finds that non-literates are more likely to cast a vote compared to their literate counterparts in contemporary Egypt. Furthermore, using survey data on the 2005 local government election in Pakistan, Akramov et al. (2008) report that less educated electors are more likely to cast their votes. Summing up, empirical evidence of the effect of education on voter turnout is mixed.

Vergne (2009) in a theoretical framework suggests that media access and freedom affect turnout. The author tests these predictions by using a sample of 60 developing countries during the period 1980-2005. The main findings of the paper are: media access measured by radio ownership promotes turnout whereas newspaper circulation and television ownership are not significantly affect turnout. Furthermore, when the government controls the content of news, citizens are less prone to express their views and hence voter turnout decreases. The author highlights two specific factors - political violence and external debt - that can affect voter turnout in developing countries.

3. Data

The data set includes both cross-sectional (state-wise) and time series observations. In the analysis, the 14 major states of India and 20 financial years (2001-02 to 2020-21) are covered. As per the latest statistics, the aforementioned 14 states accounted for 72 per cent of India's land area (2020)[7], 84 per cent of her population (as per 2011 census)[8], and 82 per cent of the gross domestic product (2021-22)[9].

The dependent variable is voter turnout at the state-level. The turnout variable is measured as the number of valid votes cast as a proportion of the total eligible voting population (i.e. number of electors). The turnout data are compiled from the website of the *Election Commission of India* (http://www.eci.nic.in). Table I shows the summary statistics of turnout across states of India.

In this paper, the variation in turnout at the state-level is explained by using explanatory variables that may be partitioned into two categories. The first category consists of two political variables: the closeness of an election and the effective number of parties in a legislature. The data on the political variables are at the constituency-level and taken from the website of the *Election Commission of India* (http://www.eci.nic.in). The construction of these variables is as follows.

Consider constituency i in a specific state and fix a specific Vidhan Sabha election. Let the vote shares of the top two parties in this constituency-election be v_1 and v_2. Then, closeness is measured as v_1-v_2. The effective number of parties (denoted by n_i) for constituency i is computed[10] as follows: $n_i = 1 \Big/ \sum_{j=1}^{N} v_{ij}^2$, where v_{ij} is the proportion of votes received by the j-th party in constituency i, $i = 1,\ldots,M$ and $j = 1,\ldots,N$. After calculating closeness and effective number of parties at the constituency -level, state-level closeness and effective number of parties are basically the average values of the constituency -level.

[7]Source: https://en.wikipedia.org/wiki/List_of_states_and_union_territories_of_India_by_area, last accessed on Dec. 17, 2024.

[8]Source: https://en.wikipedia.org/wiki/List_of_states_and_union_territories_of_India_by_population, last accessed on Dec. 17, 2024.

[9]Source: *RBI Handbook of statistics on Indian States*, Table 27 (2023), last accessed on Dec. 17, 2024.

[10]Even if there exists various indices (e.g. Wildgen, 1971) to measure the number of "effective" parties, this study uses Laakso-Taagepara Index (1979) due to its ease of calculation, its attractive theoretical properties (e.g. its link to the Herfindahl-Hirschman Index, and the fact that, when all the parties are of the same size,the effective number of parties equals the actual number of parties (i.e. $n = N$), and if all components except one are zero, $n = 1$).

Other explanatory variables are information variables and control variable. Five variables related to voter information are considered. The information variables are literacy rate, circulation of newspapers, ownership of television, ownership of radio and transistor, and telephone per 100 population[11]. Circulation of newspaper and ownership of mass media medium like television, radio and transistors were taken at gross level instead of per capita because many people can simultaneously use these media. One control variable is used. The control variable is per capita net state domestic product in constant 2011-12 rupees. The data on the literacy rate are taken from various issues of *The Statistical Abstract of India*, a Government of India publication. The data on the circulation of newspapers are collected from various issues of the *Annual Reports of the Registrar for Newspapers in India*, a Government of India publication. *2011 census* is used to collect data on television and radio and transistor. The data on telephone are collected from the *Department of Telecommunications*, Ministry of Communication, Government of India. The data on the per capita net state domestic product are taken from the *National Statistical Office*, published by the Reserve Bank of India.

4 Methodology and result

In this section, the determinants of voter turnout in the states of India is analysed. This is divided into two parts: Subsection 4.1 describes the empirical model used in the econometric analysis. Subsection 4.2 reports the empirical results obtained from the analysis.

4.1 Empirical model

The following equation is estimated to analyse the variation in voter turnout in the states of India:

$$\ln\left(\frac{y_{s,t}}{1-y_{s,t}}\right)=\alpha_s+\delta_t+\beta' x_{s,t}+\gamma' z_{s,t}+\varepsilon_{s,t}\left(s=1,...,S;t=1,...,T\right) \qquad (1)$$

where $y_{s,t}$ is the voter turnout in state s during election year *t*, $x_{s,t}$ denotes the vector of political variables measured at the state-level (e. g. closeness of elections), and $z_{s,t}$ is the vector of non-political variables measured at the state-level (e. g. literacy rate). To account for unobserved state-specific effects, state-specific dummies α_s are included; similarly, time-specific dummies, δ_t, are included to account for unobserved time-specific effects. $\varepsilon_{s,t}$ is the error term, presumed to be orthogonal to all of the regressors. In equation (1), the dependent variable is a logistic transformation of the turnout variable $y_{s,t}$. Notice that the log ratio $\left(\frac{y_{s,t}}{1-y_{s,t}}\right)$ lies between – ∞ to ∞ and therefore avoids any range restriction.

The turnout pattern for the southern states[12] appears to be different from the non-southern states[13]. The average voter turnout[14]is more and the variation in turnout[15] is lower in the southern states compared to the non-southern states of India. Because of this reason, the above model is estimated three times: once

[11] The information variable on *Telephone* is not included in the original regression model.

[12] The southern states are Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu.

[13] The non-southern states are Bihar, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh, and West Bengal.

[14] The average voter turnout rate is more than 71 per cent in the southern states and less than 67 per cent in the non-southern states (*Election Commission of India*).

[15] The average standard deviation is less than 5 in the southern states and more than 9 in the non-southern states (*Election Commission of India*).

for the 14 major states of India, once for the southern states, and once for the non-southern states of India. The resulting estimators are consistent provided that the unobserved state-specific and time-specific effects are sufficient to account for any possible correlation between the regressors and the error term.

The set of political variables (measured at the state-level) in (1) consists of two variables: the closeness of an election and the effective number of parties in a legislature. Thus,

$$\beta' x_{s,t} = \beta_1 Closeness_{s,t} + \beta_2 Effective\ no.\ of\ parties_{s,t} \quad (2)$$

The set of non-political variables (measured at the state-level) in (1) consists of five variables: the literacy rate, the circulation of newspapers, television, radio and transistor, and the per capita net state domestic product (*NSDP*). Therefore,

$$\gamma' z_{s,t} = \gamma_1 Literacy_{s,t} + \gamma_2 Newspapers_{s,t} + \gamma_3 Television_{s,t} + \gamma_4 Radio\&Transistor_{s,t} + \gamma_5 NSDP_{s,t} \quad (3)$$

4.2 Empirical result

Table II presents regression results for the 14 major states of India. The three different specifications use combinations of various explanatory variables to test the robustness of the regression results. Consider Column [1]. This Column includes two political variables: the closeness of an election and the effective number of parties in a legislature along with state and time dummies. The result is consistent with the prediction in case of effective no. of parties and contradictory result is obtained in case of election closeness. Notice that the coefficients on *Election Closeness* is positive and insignificant whereas *Effective No. of Parties* is negative and statistically significant at the conventional levels of significance. Consider the quantitative importance of the findings. An one per cent decrease in election closeness (i.e. the gap between the top two parties increases) results in a 26 per cent increase in turnout across the Indian states. Although this result is contradictory to the traditional theory ("calculus of voting") of voter turnout but in the Indian context, as the gap between the top two parties increases (i.e. election closeness decreases), third/fourth/fifth parties' supporters (as they are informed about this gap increased in this study) might turnout in large numbers so that their party can take the second position. The result for the effective number of parties is less strong - an increase in the number of effective parties by one per cent leads to a three per cent decrease in voter turnout. Two conclusions follow as a result. Voter turnout is enhanced when [1] election closeness decreases and [2] there is decreased party fragmentation measured by the effective number of parties. Conclusion [1] provides a contradictory result for the "calculus of voting" theory, while Conclusion [2] highlights the role of information costs in determining voter turnout.

Column [2] adds four variables related to voter information to Column [1]. The information variables are the literacy rate, the circulation of newspapers, the television, and the radio and transistor[16]. The *Effective No. of Parties* political variable remains statistically significant and with the predicted negative sign. The regression coefficients on *Literacy Rate*, *Television*, and *Radio and Transistor* are statistically

[16] The information variable *Telephone* is not included in the original regression model. Telephone increases voter turnout significantly in India and specifically in the non-southern states of India after controlling the effect of education (without literacy and circulation of newspaper variables).

significant with predicted positive sign for television and radio and transistor. Although the coefficient of the *Literacy Rate* is significant but the sign is negative which is unexpected according to the conventional information theory.

Column [3] adds one control variable to Column [2]. The control variable is the per capita net state domestic product. The control variable is incorporated to account for various socio-economic characteristics at the state-level. The results of Column [3] mimic that of Column [2]: the *Effective No. of Parties* political variable is statistically significant with negative sign while the information variables television and radio and transistor are statistically significant with predicted positive sign and literacy rate is significant but sign is unpredicted.

Now the all-India sample is splitted into two parts. Table III presents the turnout regression results for the non-southern states of India while Table IV does the same for the southern states. Table III and Table IV lead to two conclusions. First, across the two tables and columns, notice that the coefficient on the one political variable - *Effective No. of Parties* is negative and statistically significant in the non-southern states of India while southern states show insignificant result. Second, the coefficient on the information variable - *Radio and Transistor* is positive and statistically significant in case of southern states while non-southern states show significant result after incorporating control variable. Furthermore, the coefficient on another information variable - *Television* shows positive and significant result in the southern states of India after incorporating control variable while non-southern states does not show significant result. Finally, the coefficient on the *LiteracyRate* is positive but not significant in case of southern states but non-southern states show significant with unexpected negative sign.

5. Conclusion

In this paper, the focus has been given on the determinants of voter turnout. The important determinants are the closeness of an election, the effective number of parties, and the availability of information (viz. circulation of newspapers, television, radio and transistor, and literacy rate). A number of theoretical arguments provide the rationale for including the aforementioned determinants of voter turnout in this paper.

The data set consists of 14 major states of India for 20 financial years, 2001-02 to 2020-21. The findings that summarized below are valid regardless of the specifications considered in the analysis. The principal findings of the paper are as follows. First, voter turnout is inversely related to the closeness of elections. This result is contradictory with the “calculus of voting” theory developed by Riker and Ordeshook (1968), which states that as elections become tighter (i.e. the gap between the top two parties decreases) voter turnout increases. Second, the effective number of parties in a legislature has a negative impact on voter turnout. This result validates the theory that an increase in the effective number of parties magnifies information cost, which may reduce a voter’s incentive to cast her ballot. Third, the effects of the information variables - *Television*, and *Radio and Transistor* - on turnout are positive and more prominent in the overall India and in the southern states of India than in the non-southern states of India. These results are robust across various specifications used in the empirical analysis. Based on the empirical findings of this study, it can be concluded that for literate people, information is a positive influencing factor of voter turnout. More information the literate people gets, they are expected to turnout more to exercise their democratic rights to choose their preferable party/candidate using the knowledge gather through information (provided by television and/or radio and transistors).

6Data appendix

The data used in the paper come from different sources. The research involved data from the 14 major states of India, over a period of 20 financial years, from 2001-02 to 2020-21.

6.1 Voter turnout variable

The voter turnout variable is measured at the state-level by using Vidhan Sabha electoral data. Voter turnout is measured as the number of valid votes cast as a proportion of the total eligible voting population (i.e. the number of electors). This is a proper fraction; say *turnout*, which lies between 0 and 1. In order to avoid any range restriction on the error term, the following logistic transformation on *turnout* is applied. Thus, the turnout variable is measured as the log of the ratio $\frac{turnout}{(1-turnout)}$ and it lies between -∞ to ∞. The Vidhan Sabha electoral data are downloaded from the website of the *Election Commission of India* (http: // www. eci.gov.in).

6.2 Political variables

Two political variables are considered. The political variables are: (i) the closeness of an election and (ii) the effective number of parties. The data on the political variables are at the constituency-level and downloaded from the website of the *Election Commission of India* (http://www.eci.gov.in).

6.3 Information variables

Five variables related to voter information are included. The information variables are: (i) the circulation of newspapers, (ii) the literacy rate, (iii) the ownership of television, (iv) the ownership of radio and transistor, and (v) telephone per 100 population. The data on these variables are state-specific annual observations. The data on the circulation of newspapers are collected from various issues of the *Annual Reports of the Registrar for Newspapers in India*, a Government of India publication. The data on the literacy rate are taken from various issues of *The Statistical Abstract of India*, a Government of India publication. *2011 census* is used to collect data on television and radio and transistor. The data on telephone are collected from the *Department of Telecommunications*, Ministry of Communication, Government of India.

6.4 Control variable

One control variable is used in this study. The control variable is the per capita net state domestic product in constant 2011-12 rupees. The data on these variables are state-specific annual observations. The data on the per capita net state domestic product are taken from the *National Statistical Office*, published by the Reserve Bank of India.

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Table I: Summary statistics of turnout across states of India

States	[1] Number of elections	[2] Average turnout	[3] Min	[4] Max	[5] Standard deviation
Andhra Pradesh	5	72.40	67.96	78.69	3.20
Bihar	6	54.12	45.85	61.76	5.73
Gujarat	5	65.42	57.58	72.02	5.21
Haryana	5	72.21	67.74	76.27	2.85
Karnataka	5	68.37	64.84	72.57	3.37
Kerala	4	74.34	72.08	77.53	2.27

Madhya Pradesh	5	69.76	60.22	75.63	4.35
Maharashtra	5	62.22	59.68	65.67	2.52
Orissa	5	67.41	58.74	73.80	5.11
Punjab	5	73.70	65.70	78.30	5.23
Rajasthan	5	69.90	62.87	75.67	4.72
Tamil Nadu	4	70.68	59.07	78.29	7.43
Uttar Pradesh	4	54.98	45.95	61.24	6.10
West Bengal	4	81.11	75.10	84.72	3.74

Note: The table is based on state-level Vidhan Sabha electoral data over the period 2001-02 to2020-21. The data
are available from the webpage of the *Election Commission of India* (http://www.eci.nic.in).

Table II: Least squares results for turnout in the 14 major states of India

	Log (Turnout/ 1- Turnout)	***Log (Turnout/ 1- Turnout)***	***Log (Turnout/ 1- Turnout)***
Closeness	0.258	0.337*	0.277
	(1.16)	(1.66)	(1.19)
Effective No. of Parties	-0.0284*	-0.0337***	-0.0342***
	(-1.95)	(-3.02)	(-3.00)
Literacy Rate		-0.00832***	-0.00918***
		(-5.63)	(-5.30)
Circulation of Newspaper		-2.25E-10	-3.39E-10
		(-0.76)	(-0.76)
Television		7.22E-09*	8.34E-09**
		(1.75)	(2.12)
Radio& Transistor		1.50E-08**	1.49E-08**
		(2.02)	(2.11)
N	279	222	222
R^2	0.87	0.89	0.89

Notes:

1. The data set comprises the 14 major states of India, viz., Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal.
2. The absolute t-ratios given in parentheses are based on robust standard errors that correct for clustering at the state level: *** denotes significance at 1%, ** denotes significance at 5% while * denotes significance at 10% level.

Table III: Least squares results for turnout inthe non-southern states of India

	Log (Turnout/ 1- Turnout)	*Log (Turnout/ 1- Turnout)*	*Log (Turnout/ 1- Turnout)*
Closeness	0.0553	0.19	0.117
	(0.33)	(0.95)	(0.5)
Effective No. of Parties	-0.0525***	-0.0516***	-0.0522***
	(-3.39)	(-3.75)	(-3.67)
Literacy Rate		-0.00669***	-0.00777***
		(-5.74)	(-3.74)
Circulation of Newspaper		-4.96E-11	-1.54E-10
		(-0.14)	(-0.40)
Television		-4.71E-10	5.79E-11
		(-0.06)	(0.01)
Radio& Transistor		1.23E-08	1.23E-08*
		(1.61)	(1.72)
N	199	158	158
R^2	0.91	0.91	0.92

Notes:

1. The data set comprises the non-southern major states of India, viz., Bihar, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh, and West Bengal.
2. The absolute t-ratios given in parentheses are based on robust standard errors that correct for clustering at the state level: *** denotes significance at 1%, ** denotes significance at 5% while * denotes significance at 10% level.

Table IV: Least squares results for turnout in the southern states of India

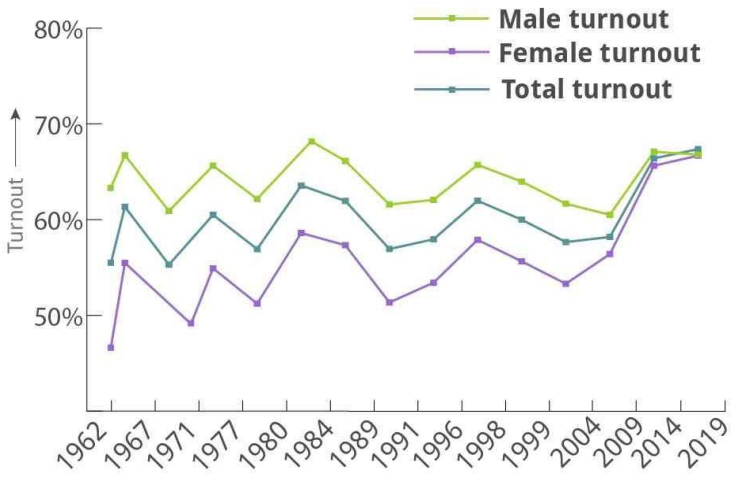
	Log (Turnout/ 1- Turnout)	*Log (Turnout/ 1-Turnout)*	*Log (Turnout/ 1- Turnout)*
Closeness	0.195	-0.0045	-0.0123
	(1.58)	(-0.02)	(-0.05)
Effective No. of Parties	-0.00637	-0.00602	-0.00397
	(-1.06)	(-0.45)	(-0.27)
Literacy Rate		0.00275	0.00224
		(0.71)	(0.62)
Circulation of Newspaper		-6.06E-10	-6.85E-10
		(-0.42)	(-0.42)
Television		7.33E-09	1.64E-08**
		(0.87)	(2.24)
Radio&		0.000000249***	0.000000270***

Transistor			
		(8.64)	(11.18)
N	60	48	48
R^2	0.90	0.92	0.92

Notes:

1. The data set comprises the non-southern major states of India, viz., Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu.
2. The absolute t-ratios given in parentheses are based on robust standard errors that correct for clustering at the state level: *** denotes significance at 1%, ** denotes significance at 5% while * denotes significance at 10% level.

Fig. I: Trend in Voter Turnout in India (1962-2019)



Source: Trivedi Centre for Political Data