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Turnout in Developing Countries: The Effect of Mass Media on National Voter Participation

Clémence Vergne¹

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Abstract:

Previous research on electoral participation has paid little attention to turnout in developing countries. Even more understudied is the effect of mass media, as the main source of political information, on voter turnout in new democracies. This paper argues that voter turnout patterns in developing countries can be explained by extending the traditional rational voter model to include recent developments of the information theory of turnout. Embedding limited information, our theoretical framework suggests that media access and freedom affect turnout. We test our predictions in a sample of 60 developing countries over the period 1980-2005. We find that media penetration, as measured by radio ownership, fosters turnout, whereas newspapers circulation and television ownership are not significant. In addition, we show that when government controls the content of news, citizens are less prone to express their views at the polls. Finally, we highlight specific factors –political violence and external debt– that affect turnout in developing countries.

JEL Codes: D72, O1, P16

Keywords: Voter Turnout, Media, Electoral Politics, Political Economy

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1. Introduction

Following the third wave of democratization in the 1990s, elections are now common in developing countries. However, beyond the widespread belief that the setting of regular elections is a real improvement per se, it seems us essential to understand how elections are supposed to bring about democracy, or rule according to the will of people.

Electoral participation is one of the three main indicators of democratic performance (Powell, 1982).² However, electoral turnout is declining in most democracies (Blais, 2000; Gray and Caul, 2000). Moreover, voter turnout varies considerably, both over time and across countries and individuals (Lassen, 2005). This variation is not random and electoral participation seems to be highly unequal and biased in favor of more privileged citizens –those with higher incomes, greater wealth and better education– and against less advantaged citizens (Lijphart, 1997). We suggest that this may prevent elections to properly perform their three key functions: (i) to discipline the elected officials by the threat of not being reappointed (accountability effect); (ii) to select competent individuals for public office (legitimacy effect); and, (iii) to reflect the preferences of a large spectrum of voters (representativeness effect).

The accountability effect is straightforward. Elections affect the incentives facing politicians. The anticipation of not being reelected in the future leads elected officials not to shirk their obligations to the voters in the present (Barro, 1973; Ferejohn, 1986; Fiorina, 1981; Manin, 1997). In this view, elections are seen as a sanctioning device that induces elected officials to act in the best interest of the people. However, one important condition that affects political accountability is the competitive electoral mechanism, and at the core of the electoral mechanism is the vote. The vote is the primary tool for citizens to make their governments accountable. If a large fraction of citizens don't express their opinions, elections would create no incentives for politicians to espouse or implement policies in the public interest. In the mandate view, elections serve to select good policies or political leaders (Rogoff, 1990). There is a legitimacy effect as a government which has acquired power through winning an election has a mandate to implement its commitments and the wide recognition of this mandate reduces the ability of those opposed to these policies to block them. Thus, low and unequal turnout can reduce the perceived legitimacy of government. Finally, elections are seen as a representational instrument since they signaled the voters' conflicting preferences. If turnout is unequal, the interest of some citizens are taken into account in policymaking more strongly than the interests of others. Indeed,

² The two others main indicators of democratic performance are government stability and the degree of violence (Powell, 1982).

unequal electoral participation can distort the pattern of representation necessary for democratic responsiveness, leading to real effects on policy outcomes.³

As a result, elections are a representational instrument and an effective mechanism to select and discipline politicians only if individuals show up at the polls to express their views. However, although electoral participation in developed countries has garnered considerable attention, voter turnout in developing countries has been largely ignored. This lack of attention is unfortunate since this issue is of first importance. Elections in developing countries have become a fundamental concern of the international community. Since aid was first used conditionally to promote “Structural Adjustment” in the 1980s, the international community has recognized that policy improvement is fundamental to development. During the 1990s, the approach to how good policies should be promoted shifted from conditionality, which was increasingly seen as both ineffective and unacceptable, to the promotion of democracy (Chauvet, Collier, 2008). Electorates rather than donors would coerce governments into good performance. At the core of the promotion of democracy was the promotion of elections: for example, in 2006 donors provided \$500 million to finance elections in the Democratic Republic of the Congo (Chauvet, Collier, 2008). Thus, worldwide there has been a drive to make governments more accountable to the needs of citizens. The governance agenda has been pushed by a range of actors from domestic to international NGOs through to the international financial organizations. As there is widespread consensus on the need to improve political accountability, the phenomenon of electoral participation needs to be better understood. Finally, developing countries provide an ideal context to study the determinants of electoral participation. In contrast to the relatively stable old democracies, developing countries exhibit far greater variance in economic performance, level of democracy and institutional arrangements.

This paper proposes a comprehensive analysis of the determinants of political turnout in developing countries. More specifically, this study extends the traditional rational voter model to include recent developments of the information theory of turnout. Embedding limited information, our theoretical framework suggests that media access and freedom affect turnout. This question is particularly relevant in the context of developing countries. While high-income countries have high levels of media penetration and freedom, developing countries vary widely in terms of media access and freedom. We examine 307 national elections held in 60 developing countries, between 1980 and 2005. We find that media penetration, as measured by radio ownership, fosters turnout, whereas newspapers circulation and television ownership are not significant. In addition, we show that when government controls the content of news, citizens are less prone to express their views at the polls.

³ One example that representation matters for outcomes is provided by Ansolabehere, Gerber and Snyder (2002). They study the court-ordered redistricting in the United States in the 1960s. They find that counties that lost legislative seats during the court-ordered redistricting subsequently received a smaller share of state funds per capita.

Of course, any attempts to specify the effects of media penetration and freedom will raise econometric difficulties. However, the patterns presented in this paper hold true even after controlling for a large set of factors. Moreover, while other studies on the effects of media in a large sample of countries (Islam, 2002; Leeson, 2008) use cross-country data, we use panel data and discuss within-country evidence. Nevertheless, much work remains to be done in sorting out issues of causality, perhaps by figuring out appropriate instrumental variables.

Our findings complement other recent research on the effects of media access and freedom. For example, Besley and Burgess (2002) find that higher newspapers circulation is associated with increased government responsiveness to shocks in India.⁴ Djankov, Mcleish, Nenova and Shleifer (2003) find that private media ownership is associated with improved social outcomes; in contrast, where the media is state-owned, they observe poorer education and health indicators. While the empirical literature is in its infancy, existing studies suggest that mass media make governments more accountable and responsive. In this paper, we argue that electoral participation may be the channel by which mass media improve government accountability. Media make citizens more politically knowledgeable and active. Politicians realize this, which creates an incentive for them to be accountable.

The structure of the paper is as follows. In Section 2 we present the evolution of voter turnout in established and new democracies. Then, we depict the raw relationship between media freedom and voter turnout in developing countries. Section 3 reviews previous theoretical and empirical work on the effect of information on voter turnout. Section 4 presents the conceptual framework and emphasizes the main hypotheses that we will test. Section 5 presents the empirical analysis. Section 6 concludes.

2. Unequal Participation: Some Stylized Facts

This section starts with an overview of how turnout is defined in previous studies. Given the heterogeneity observed in the measure of this variable, this enquiry is essential. Then, we provide an overview of voter turnout around the world since 1945 and we investigate the raw relationship between media freedom and voter turnout in developing countries.

2.1. Measuring Voter Turnout

Defining turnout as the absolute number of people voting in the election or as the share of the population that has cast its vote is obviously correct. However, when turnout is defined as a share of ‘the population’, a clear definition of this population variable is required. Did one take the ratio of the number of voters to the entire population, to the voting age population, to the eligible population or to the number of

⁴ Using panel data from Indian states for 1952-1992, they look at two policy response systems: first, public distribution of food as a response to falls in food production associated with droughts, and second, spending on calamity relief as a response to crop damage caused by floods.

people registered to vote? This affects the size of –and quite likely the variation in– turnout rates and thus may affect the estimation results.

Almost all previous studies define turnout as some sort of ratio.⁵ However, many of these analyses fail to provide a clear and complete definition of the denominator (Geys, 2006). Therefore, we suggest to clarify the different definitions and to discuss advantages and drawbacks in using these calculations as the basis for turnout statistics particularly in the context of developing countries.

Many studies use the percentage of registered voters that vote (e.g., Blais and Carty, 1990, Blais and Dobrzynska, 1998; Blais, 2000; Mattila, 2002). This measure presents two key drawbacks. First, in some countries registration figures are inaccurate (as in Guatemala)⁶ or unavailable, and sometimes voter registers are not used (as in South Africa in 1994). Thus, the registration rate sometimes exceeds the estimated voting age population. The explanation for this apparent anomaly usually lies in the inaccuracy of the electoral register. The register can also under-represent the true size of the eligible voter pool if, as is often the case, it fails to record the names of new voters who have come of age or migrated to an area. Both of these scenarios represent relatively common problems facing electoral administrators around the world, particularly in developing countries (Gratschew, Pintor, 2002). Second, we argue that there is an even more fundamental problem with using registered voters as the denominator when measuring turnout. Indeed, the act of voting actually requires two separate acts, namely registering to vote and voting *per se*. If a causal force is to generate greater turnout, it needs to motivate citizens to first register and then follow through with a vote. Obviously, the two acts are correlated since citizens who are sufficiently motivated to register will also be more inclined to vote. If registration and voting are correlated, however, then the ratio of voters to registered voters is a biased measure of citizen's motivation to vote (Endersby, Kriekhaus, 2008). We have essentially eliminated all citizens who were not sufficiently motivated to register in the first place, and this drops from the analysis a large part of the variation in citizens' willingness to engage in voting behavior. As we are ultimately interested in knowing why some citizens vote and others do not, it does not make sense to drop the large number of citizens who decide to forgo both voting and registration. Put differently, the act of registering is a concrete sign that a citizen does prefer to vote, and is therefore a critical intervening process that lies between the underlying preferences and the act of voting itself. When we divide total votes by the registration rolls we control for the underlying preferences. Given that these preferences are presumably much of the reason that citizens ultimately vote, we do not want to control for such preferences but rather we wish to understand how they are determined by other variables. This problem is mitigated in many countries where registration is mandatory, but even mandatory registration may not motivate otherwise apathetic

⁵ For a comprehensive review of the empirical literature on voter turnout, see Geys (2006).

⁶ Current estimates show that about 25 percent of all inscriptions are incomplete or out of date, or relate to deceased persons and migrants (Boneo, Torres-Rivas, 2000).

citizens to register. Mandatory requirements are not still enforced, and registration does in fact vary substantially from country to country. Thus, mandatory registration is a spectrum ranging from a symbolic, but basically impotent, law to a government which systematically implements sanctions against non-voting citizens.

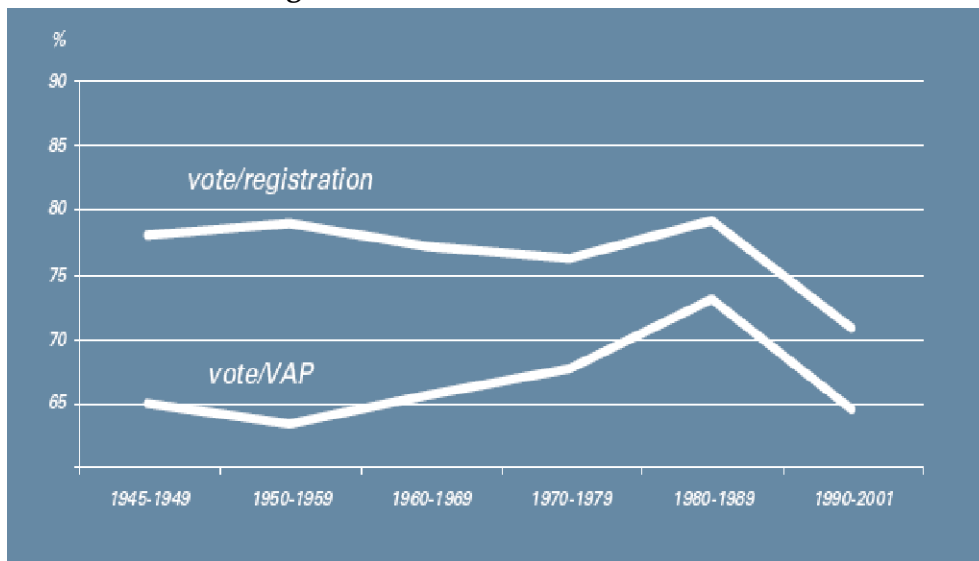
Various other studies divide the number of voters by the voting age population (e.g., Powell, 1980, 1986; Jackman, 1987; Jackman and Miller, 1995; Katz, 1997; Norris, 2002). The denominator thus leaves out those that have not yet reached the age at which one is legally allowed –or in some cases obliged– to vote (18 years in most countries). Therefore, voting age population can provide a clearer picture of participation as it may signal a problem with the voters' register or registration system. However, voting age population suffers two shortcomings. First, voting age population is simply estimated based on the total national population. So, it is not able to exclude those within a population who may not be eligible for registration or voting due to factors such as non-citizenship, mental competence or imprisonment. For example, turnout data is artificially low in countries with a large alien population (Blais, Dobrzynska, 1998). Second, it is likely that population statistics are somewhat inaccurate, since they are approximated through census data. Indeed, registration figures are, in most cases, more often updated than population figures (Gratschew, Pintor, 2002).

Very few studies regard only that part of the population that is eligible to vote (e.g., Matsusaka, Palda, 1993). This not only disregards individuals under the legal voting age, but also ineligible felons and noncitizens. Thus, eligible population appears to be the best measure to compute turnout rates. However, preference of one ratio over the other is often guided by data availability and eligible population figures are not available for most developing countries. For that reason, we will use the percentage of voters on the voting age population to measure voter turnout in our empirical analysis.

2.2. Worldwide Turnout

Figure 1 examines the evolution of voter turnout since 1945 for both parliamentary and presidential elections. It is based on the International Institute of Democracy and Electorate Assistance database of elections, which covers 170 independent states and includes data for 1256 parliamentary elections and 412 presidential elections. As aforementioned, voter turnout as a percentage of registration is higher than turnout as a percentage of the voting age population. Figure 1 shows a notable decline in voter turnout since the mid-1980s, whether turnout is measured as a percentage of registration or as a percentage of the voting age population. However, we suggest that this global trend may not be valid in new democracies.

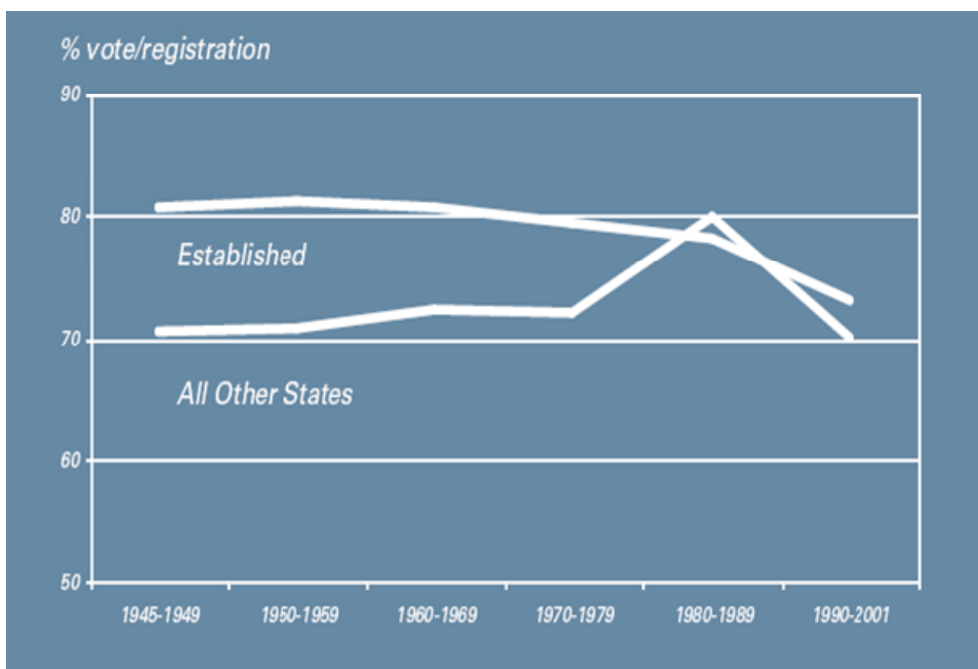
Figure 1 - TURNOUT OVER TIME



Registration: registered voters. VAP: voting age population.
Source: International IDEA voter turnout database.

2.3. New and Established Democracies

Figure 2 - DIFFERENCES BETWEEN ESTABLISHED DEMOCRACIES AND OTHER STATES



Source: International IDEA voter turnout database.

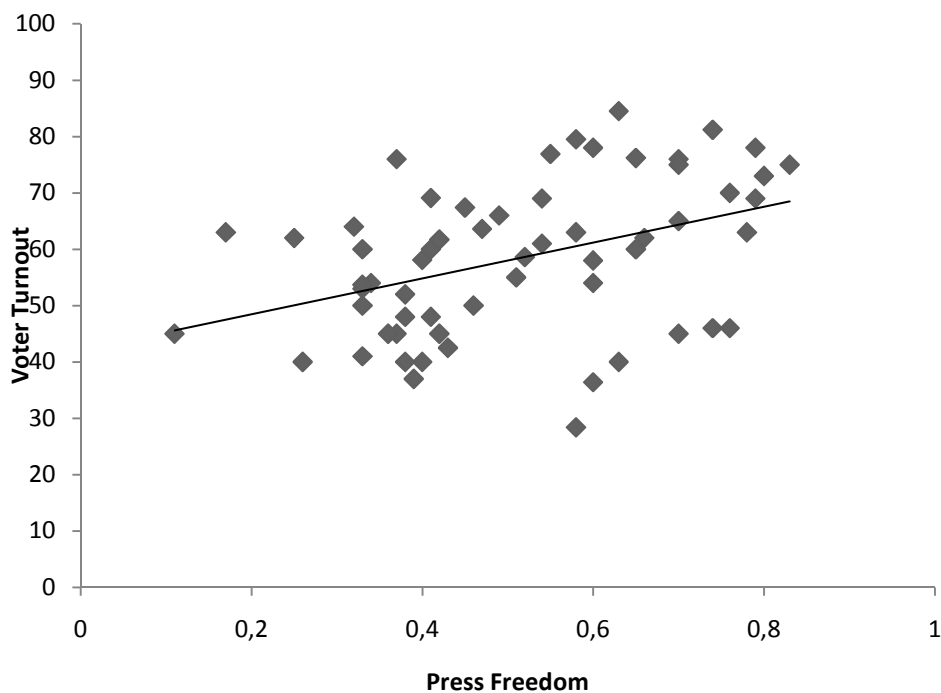
Figure 2 reveals that high-turnout countries are neither exclusively new nor established democracies. Established democracies have seen a slow but steady decline in turnout since the 1970s. During the 1970s, however, as a result of democratization

movement, other states experienced an increase in voter turnout, peaking at about 80 percent. The current turnout in new democracies is about 70 percent, lower than the 73 percent in established democracies.

2.4. Media Freedom and Voter Turnout

Figure 3 depicts the raw relationship between media freedom and voter turnout in 60 developing countries. To investigate this pattern, we use the International IDEA data on electoral participation. Voter turnout is measure as the number of votes cast divided by the voting age population. To measure media freedom, we use Freedom House index of media freedom.⁷ Each country is rated in three areas of potential state influence over the media: legal environment, political influences and economic pressures, to determine an overall score. This score is rescaled from 0 to 1 where a higher score means more freedom. For each country, we take the average values of voter turnout and media freedom associated with each election between 1980 and 2005. We restrict our analysis to elections held after 1980 as data on media freedom are not available before this year.

**Figure 3 - MEDIA FREEDOM AND ELECTORAL PARTICIPATION
IN DEVELOPING COUNTRIES**



According to Figure 3, a freer media is associated with higher voter turnout in developing countries. Thus, citizens seem to be more politically active when

⁷ Appendix 3 presents the variables and their sources in detail.

government doesn't control the content of news. This first result suggests that media-provided information affects turnout in developing countries. In the next sections, we propose to investigate this relationship more closely.

3. Related Literature

The literature on voter turnout is voluminous, and no attempt to survey it will be made here. Recent surveys and discussions of the literature are provided in Blais (2000, 2006) and Mutsusaka and Palda (1999). We focus only on studies that analyze the effect of information on voter turnout. After a look at theoretical work linking information and turnout, we review previous empirical studies.

3.1. Why being Informed Affects Voting Behavior

Individuals are constrained both by a lack of knowledge about the different consequences of their decisions and their limited intellectual capacity to analyze all available options. In other words, the information level of the population is likely to be much less than complete. Recent formal models incorporate this idea of limited information in a theory of voter turnout.

Two works propose a decision-theoretical model of voter turnout. Matsusaka (1995) embeds an information theory in the standard rational voter model. He takes as given that each citizen is predisposed to vote, and then focuses on how information can lead some to follow through on this inclination and others to abstain. The key link is that a person's expected benefit from casting a decisive vote is increasing in her certainty that she is supporting the best candidates. As a result, the person is more likely to vote as she becomes surer about which way to vote. Confidence in a voting decision is increased by raw information about candidates and knowledge about the model of the world. Thus, as the price of information falls and knowledge rises, a person's ability of voting goes up. As stressed by Matsusaka, it is the voter's subjective belief about his information level that guides participation, and this can differ from objective measures of political knowledge. Larcinese (2006) adds that the amount of political information that voters decide to acquire during an electoral campaign depends, among other things, on prior ideological beliefs about candidates. Voters that are *ex ante* indifferent about the candidates attach little value to information because they perceive that voting will have little value. Voters that are *ex ante* very ideological also attach little value to information because they think that the news would hardly change their opinion. Thus, high incentives to be informed can be found at intermediate levels of ideological strength. Moreover, Larcinese (2006) argues that the impact of increased political knowledge on turnout is asymmetric: new information increases the probability of voting of indifferent voters but decreases that of very ideological voters.

Another effort at incorporating information in a model of voter turnout was made by Feddersen and Pesendorfer (1996, 1999). They propose a game-theoretic model of voting, where turnout decision is influenced by the information structure facing

prospective voters. The election they consider is a referendum on whether to adopt a new policy instead of the status quo. In the model, voting is costless for all agents and, thus, abstention cannot be explained by differences in the cost of voting.⁸ The difference in the voting behavior among agents comes from the presence of asymmetric information: some agents are informed, some uninformed. The central result of Feddersen and Pesendorfer (1996) is that it can be optimal for uninformed independent voters to abstain from voting even though they may prefer one alternative to the other. The reason is that by abstaining they effectively defer the choice to the informed voters who, by definition, vote for the correct policy. When there is a large number of voters, this will lead to the correct policy being chosen (Feddersen, Pesendorfer, 1997). The central empirical prediction is that more informed agents should vote in the election, while uninformed agents should abstain from voting. At the aggregate level, increasing the expected fraction of informed voters will, then, lead to a lower level of abstention.

The aforementioned models cannot explain the mere existence of voter turnout. In fact, they assume some predisposition to vote and focus on the factors that affect whether citizens translate this preference into action. Therefore, information-based models don't predict an actual level of turnout, but rather explain turnout at the margins (Matsusaka, 1995). Nevertheless, the great advantage of the information theory of voter turnout is its ability to explain most of the empirical regularities identified by previous studies in established democracies. For example, campaign spending and personal contact by campaign workers increase voter turnout because they provide inexpensive information. Public employees and farm owners are more likely to vote as they interact frequently with the government, giving them cheaper access to information. Long time residents in a community are more likely to vote than people who recently move since they have better contextual knowledge to evaluate the local impact of policies. A person's age is positively correlated with her probability of voting as age brings knowledge that is useful in processing information.

From this perspective, mass media and education seem to be important determinants of voter turnout patterns. Education brings knowledge that is useful in processing information. Mass media is the main source of political information. As media coverage increases, electoral participation is expected to rise. In the same spirit, media freedom may increase voter turnout since it improves the quality of political information.

3.2. Empirical Studies

Previous empirical analyses examine the effect of information on voter turnout from two main angles. One body of research concentrates on education. Two recent articles investigate the causal effect of education on voter turnout: following a literature in labor economics, Dee (2004) and Milligan, Moretti and Oreopoulos (2004)

⁸ This hypothesis contradicts the traditional decision-theoretic literature originating with Riker and Ordeshook (1968).

use U.S. state government variation in compulsory schooling laws as instruments to identify the effect of education on voter turnout and other aspects of civic participation. Both studies find that more education causes a higher propensity to vote. Milligan, Moretti and Oreopoulos further find that education also implies greater political knowledge and greater interest in politics. However, this leaves open the question of exactly how education increases turnout. Several reasons are possible, including lowering costs of information processing but also through reducing alienation and increasing compliance with social norms through socialization. A key result of Milligan, Moretti and Oreopoulos (2004) is that the effect of education on turnout in the United States disappears when conditioning on registered voters, suggesting that the role of education is to overcome registration barriers. Moreover, there is no effect of education on turnout in the United Kingdom, where most voters are registered through local governments. Similarly, Lassen (2005) uses survey data from Copenhagen referendum on decentralization and he finds no direct effect of education on voter turnout, but he shows some evidence of an indirect effect, through information. These findings suggest that education enters directly into the calculus of voting by reducing expected utility costs associated with information acquisition and processing, rather than through contextual or socialization effects. Some studies investigate the effect of education on voter turnout in developing countries. However, their findings are contradictory. On the one hand, Lesson (2008) finds that education has a positive impact on political participation in 13 Central and Eastern European countries. In two states in northern India, Krishna (2006) shows that education is more important for democratic participation than wealth and social status. On the other hand, Fornos, Power and Garand (2004) find that education doesn't affect voter turnout in Latin American countries from 1980 to 2000. In the same vein, Birner, Kamijon, Khan and Qureshi (2008) analysis suggests that, in Pakistan, more educated people are less likely to vote. These authors argue that one possible explanation for this finding is that, in a clientelistic environment, the votes of less educated people tend to be cheaper to purchase by candidates, and less educated people are more vulnerable to intimidation by authorities.

Another strand of research focuses on the effect of media coverage and freedom. Several studies have discussed the role of media-provided information in informing the electorate. In an analysis of the effects of information on New Deal spending in the United States, Strömberg (2004) finds that regions that were more informed, measured by a higher share of radio ownership, had higher turnout in general elections. In addition, regions with a high voter turnout are more successful in attracting redistributive spending. Similarly, Prat and Strömberg (2005) use panel evidence from Sweden to measure the effect of the introduction of commercial broadcasting on voter information and turnout. They find that people who start watching commercial TV news increase their level of political knowledge and their political participation more than those who do not. In contrast, Gentzkow (2006) finds that television's introduction significantly reduced voter turnout in the United States. Gentzkow argues that

television's introduction caused substitution away from newspapers and radio, and so reduced citizens' knowledge of politics. Furthermore, since television is a dramatic improvement in the amount of entertainment available to households, it may have also reduced the total time devoted to news consumption. Other studies examine the relationship between press freedom and political participation. Studying 13 Central and Eastern European countries, Leeson (2008) shows that low media freedom is strongly associated with poor political knowledge, low political participation, and low voter turnout.

To sum up, empirical findings on the effect of education on voter turnout in developing countries are not conclusive. Moreover, empirical studies on the impact of media coverage and freedom don't investigate the effect of mass media on electoral participation in developing countries.

4. Theoretical Framework

Consensus on the determinants of turnout is less overwhelming in the case of developing countries (Blais, 2006). The question addressed in this paper is therefore how the determinants that have been identified in the literature, particularly the information, play out in developing countries, where citizens are on average less habituated to vote than citizens in advanced democracies, where socio-economic circumstances are less favorable, and where the institutional context is likely to be less stable and predictable than in advanced democracies. In Section 4.1, we present a theoretical framework, based on the rational voter approach, which incorporates the recent developments of the information theory of voter turnout. In addition, we operationalize this model in the context of developing countries. In Section 4.2, we sum up the different hypotheses that we will test in our empirical analysis.

4.1. Rational-Choice Perspective and Voter Turnout

Understanding the individual voter's decision whether or not to turn out to vote has been a major challenge for public choice. From a pure rational choice perspective, voting is an instrumental act, i.e. a means to influence the election outcome. Thus, voting is irrational because the probability of affecting the election outcome with one's vote is close to zero in most elections and the potential benefits of voting are always lower than the costs of voting. Indeed, voters have to spend time and resources to become well informed on the relative quality of the candidates, decide who to vote for and go to the polls on the Election Day. Nevertheless, citizens do turn out and vote, giving rise to the so-called "paradox of voting" (Downs, 1957).⁹ In trying to explain this paradox, many authors have critically examined the underlying motivations of the individual voter. The most fruitful approaches start from the observation –made by

⁹ Downs' (1957) was not a formal theory of voter turnout. He provides a theory of government behavior based on rationality, i.e. the actions of the government are assumed to arise from the rational pursuit of some goals. The specific goal proposed by Downs is to maximize political support. In this context, the act of voting has special importance. "In order to plan its policies so as to gain votes, the government must discover some relationship between what it does and how citizens vote" (Downs, 1957).

Downs himself– that voting may not be instrumental in all circumstances: voting could be motivated by factors other than the desire to determine the outcome of the election. For example, voting may serve as a means to create social solidarity or to express political preferences. Downs’ suggestion for resolving the voting paradox stipulated that people vote because of a sense of civic duty. In this case, voters may be gratified by the act of voting rather than the outcome. Later authors have paid still more attention to voting’s expressive content. Individual voters thereby derive utility from the very act of expressing their political preferences or their solidarity with a peer group or from performing an ethical act.¹⁰

We propose to develop a theoretical framework based on the traditional rational voter model in the context of developing countries. There is considerable literature on the merits and weaknesses of rational-choice models of voter turnout (see Green and Shapiro, 1996; Blais, Lapp and Young, 2000). However, even fundamental critics of the rational choice model cannot ignore its usefulness in estimating the marginal impacts of various political and socioeconomic factors on voter turnout. As Green and Shapiro (1996) indicate, one advantage of the rational-choice perspective over competing explanatory approaches is the ability to estimate the marginal impacts of various factors on voter turnout. Those estimates can then be used to make plausible predictions about the effects of changing, for example, the costs of voting on voter turnout.

According to the famous calculus-of-voting model developed by Riker and Ordeshook (1968), voters operate rationally, and their decisions whether to vote are based on the expected utility of the vote. The model takes the following form:

$$R = PB - C + D, \quad (1)$$

where R is the net satisfaction that an individual receives from voting. This depends on the instrumental benefits (PB), costs (C) and expressive benefits (D) from voting. The instrumental benefits term (PB) is the product of two components. The first (P) gives the probability that one’s vote is decisive, meaning that it leads one’s preferred party to victory. The second factor (B) is the instrumental net benefit, which gives the utility gain that is realized when one’s preferred party comes into power. B thus corresponds with the difference between the utility from the preferred party’s platform minus the utility from the opponent party’s platform. The larger this difference, the higher are the potential gains from casting a vote. The costs C comprise the information costs as well as the opportunity costs of heading to the polls. Finally, D is the voter’s social and personal gratification (expressive benefits) from voting. Riker and Ordeshook (1968) suggest five major forms of social and personal gratification people get from voting: complying with civic duty to vote, affirming allegiance to the political system,

¹⁰ The ethical voter hypothesis was first put forward by Goodin and Roberts (1975). Fiorina (1976) first proposed the expressive voter hypothesis, although it has received its most extended development by Brennan and Lomasky (1993), Brennan and Hamlin (2000) and Schuessler (2000). A discussion of the importance of ethical motivations can be found in Blais (2000), who also provides favorable survey evidence.

affirming a partisan preference, verifying an important role in the political system, and displaying general interest in politics. In the calculus-of-voting model, the instrumental benefits (B) are contingent on the probability of affecting the outcome of an election, whereas consumption benefits (D) do not depend on this contingency.

Regarding the expected-utility hypothesis, citizens are expected to weight the benefits of voting against the costs, and only decide to go and vote when the benefits outweigh the costs. Thus, a voter who prefers one of the candidates should vote rather than abstain only if $R = PB - C + D > 0$ or $PB + D > C$. For those who do not vote, it is reasonable to assume that $PB + D < C$. Further, assuming that $PB \geq 0$ for all voters, one can expect that:

- (i) if $D > C$, then the voter always votes; and
- (ii) if $D \leq C$, then the voter votes only if $PB > C - D$, and he abstains if $PB \leq C - D$.

While leaving the other predictions of the expected utility model largely unaffected, the addition of consumption benefits (D) to the calculus of voting can explain positive turnout levels. However, it does so at a severe price. As any action can be explained by making the appropriate assumptions *post hoc*, the model loses all predictive value (Grossman and Helpman, 2001; Mueller, 2003). Importantly, the expressive voter hypothesis will necessary be tautological unless we can identify the reasons why some people wish to express a preference and others do not. Therefore, hereafter it is assume that $D = 0$.

Moreover, we suggest extending the traditional rational voter model by including the recent developments of the information theory of voter turnout (Matsusaka, 1995). The mechanisms of this model can be summarized as follows. In order for a person to assess which candidate she prefers, she needs to know what policies each candidate plans to implement if elected, and what are the likely consequences of the policies. Her information and knowledge about these issues are always incomplete. This implies that if she votes for Candidate 1 there is a possibility that she would have preferred to vote for Candidate 2 if she had perfect information. If the probability that she is making the right voting decision is denoted ϕ , then it is straightforward to show that B in equation (1) is increasing in ϕ . Roughly speaking, the value of changing the election outcome is higher when the voter is more confident that she is electing the right candidate. As ϕ rises, then, she is more likely to vote. The value of ϕ is shown to be increasing in information about candidates and knowledge about how candidates map into outcomes.

Consider an election with two possible outcomes. Call them “Candidate 1 wins” and “Candidate 2 wins.” Let $V(1)$ and $V(2)$ be the utilities a person receives if Candidate 1 wins and Candidate 2 wins, respectively. These are taken to include all forms of payoffs, from government services the individual receives to services to others that she likes for altruistic reasons. It is useful to suppose that these payoffs are determined according to $V(t) = MZ(t)$ where $Z(t)$ represents the characteristics of Candidate t (policies, personal abilities, and so on) and M is the structure of the world,

that is, the way candidates map into payoffs. One might think of M as “the model” and Z as the inputs.

Define $Z = Z(1) - Z(2)$ and suppose that $M \in \{-1, 1\}$. Then a voter favors Candidate 1 if $MZ = 1$ and Candidate 2 if $MZ = -1$. The problem confronting a citizen is that neither M nor Z can be observed directly. A voter can never be certain whether $MZ = 1$ or $MZ = -1$ so she can never be certain of supporting the right candidate.

This formulation implies that if a person’s vote decides the election, her net payoff is 1 if she chooses the right candidate and -1 if she chooses the wrong candidate. Let I represent the information a person has about M and Z . The probability that Candidate 1 is best can be written $Pr(MZ = 1 | I)$ and the probability that candidate 2 is best is $Pr(MZ = -1 | I)$. If she goes to the polls, the person casts her vote for Candidate 1 if $Pr(MZ = 1 | I) > 0.5$; otherwise she votes for Candidate 2. Then the probability that the candidate who receives her vote is in fact the right candidate for her is:

$$\varphi = \max \{Pr(MZ = 1 | I), Pr(MZ = -1 | I)\},$$

The probability that the candidate who receives a person vote is in fact the right candidate for her (φ) is called her certainty or confidence about her vote.¹¹ Note that φ takes on values between 0.5 and 1. If $\varphi = 1$ then she is absolutely certain that she is supporting the right candidate, while if $\varphi = 0.5$ then she is completely uninformed. A more structured formulation of equation (1) can be developed by noting that the expected benefit to casting a decisive vote is:

$$B = \varphi (1) + (1-\varphi) (-1) = 2\varphi - 1,$$

Given that we assume that $D = 0$, then equation (1) takes the following form:

$$R = P (2\varphi - 1) - C, \tag{2}$$

It follows that the benefit from voting is higher when φ is high, which captures the intuition that uncertain voters are hesitant to vote. Moreover, a person’s confidence depends on her general knowledge, which gives insight into the true value of the model of the world, and raw information, which helps to understand the characteristics of the candidates (policies, personal abilities) by delivering a clearer signal. This breakdown of information echoes Downs (1957): “The knowledge (a person) requires is contextual knowledge as well as information.” In practice, we might think of raw information as media coverage of campaigns and general knowledge as accumulated learning about history, civics, politics and economics.

Rendering inferences from equation (2) requires measuring each component of the model. Therefore, we propose to discuss the main components of the equation (2) in the context of national elections in developing countries.

¹¹ Note that φ indicates how accurate a voter believes her opinion is, not how accurate it is in an objective sense (although the latter probably affects the former).

Expected Benefits of Voting (B)

Based on our theoretical framework, the expected benefits of voting depend on three categories of variables. First, a voter's expected benefits of voting are likely to be based on the policy packages that she prefers to be carried out and the parties or leaders that she prefers to govern the country. This implies that there should be at least one party offering the type of candidates and policies that this particular voter prefers, otherwise she will not benefit from voting, and abstaining will be rational (Wessels, Schmitt, 2008). Therefore, we suggest that, at the aggregate level, the expected benefits of voting derive from having a choice in elections. Indeed, when there is no policy package or leader that appeals to citizens, why should they go to the polls? Empirically, the expected benefits of voting can be measured by (i) the availability of choice and (ii) the match of supply to demand, i.e. whether voters have a party that is close to their preferences (Wessels and Schmitt, 2008). The latter is difficult to measure at the aggregate level. We can assume that the more differentiated choice options are, the higher the chances that there is a party close to voter's preferences. However, data on polarization (range of party positions) are not available for many developing countries. Hence we use only fragmentation (number of parties).

Second, as stressed earlier, *B* depends on a voter's confidence that he is voting for the right candidate. The voter's certainty is increasing in his general knowledge and information. At the aggregate level, general knowledge can be measured by education levels. However, data on educational attainment are not available after 2000. Therefore we use literacy rate. Moreover, as mass media is the main source of political information, we can assume that as media coverage increases, voter turnout rises. A different way to address the role of media is to estimate the different effect on turnout of press, radio, and television. Relative to a situation where only print media are available, it is plausible to suppose that the price of information is lower if radio also becomes available and still lower if television becomes available. Finally, we can assume that the quality of information affects the voter's certainty. Indeed, if people don't have confidence in the information disseminated by the media, they will not use it to determinate their vote and their confidence will not improve. From this perspective, freedom of the press should increase electoral participation.

Finally, expected benefits of voting depend on impact uncertainty, i.e. the degree to which governments effectively control policy implementation. For example, it has been argued that turnout is lower in democracies whose governments are subject to some form of external control, such as colonial rule.¹² Impact uncertainty is based on voter's evaluations of the extent to which the election outcome will have an impact on actual policy-making. If the likelihood of affecting the policy outcome is low, due to low executive control of policymaking, the expected benefits of voting are small. In developing countries, we argue that executive control might be limited for two reasons. New democracies can have high external debts. In addition, executive control

¹² Franklin (2004) provides the example of Malta in his book on voter turnout, arguing that the rise in turnout in Malta after 1962 was due to the end of British colonial rule in 1964.

of policymaking might also be limited when bureaucracies do not function optimally, which might be a problem especially relevant to developing countries, where institutions are often less consolidated and levels of corruption tend to be higher.

Probability of Realizing Benefits through the Vote (P)

Franklin (2004) has pointed out that voters do not know P with certainty, and it is precisely the uncertainty that voters face in estimating P that renders it rational to vote. Voters' considerations of the probability that their vote will contribute to their preferred election outcome are based on two types of uncertainty: (i) strategic uncertainty, and (ii) outcome uncertainty. Strategic uncertainty is the uncertainty whether sufficient other co-partisans and sufficiently few opponents will turn out and vote to let one's preferred party win. This type of uncertainty is likely to depend on the information that voters receive before the elections about the likely behavior of their co-citizens, for example through their social networks and opinion polls. Hence, if opinion polls predict that many other citizens will turn out to vote for one's preferred party, rendering winning highly likely, a rational citizen would decide to stay home, and vice versa.¹³ This relates to the second type of uncertainty: outcome uncertainty. Outcome uncertainty is defined by voter's expectation about the election results: if uncertainty about the outcome is high, it is more rational to vote. Note that if voters are certain that their preferred party will win, or lose, the election, it is irrational for them to vote since their vote has no chance to contribute to the outcome of the election. Based on these considerations, we expect turnout to be higher if strategic uncertainty and outcome uncertainty are high. Empirically, outcome uncertainty can be measured by two elements. First, more people vote when the election is close (Blais, 2000). The standard indicator for the closeness of the electoral outcome is the difference in vote shares between the leading and the second parties. Second, more people vote when elections are fair. If elections are fraudulent, people are less likely to vote, knowing that their vote is likely to have little bearing on the election outcome. Strategic uncertainty seems more difficult to measure empirically at the aggregate level. In the literature on turnout, this aspect is often measure by population size, however it seems unlikely that voter's estimates of strategic uncertainty depend on whether all citizens go and vote. Rather, strategic uncertainty estimates should be based on expectations of to what degree co-partisans and opponents will turn out and vote, which will depend on the degree to which citizens are informed through their social networks and opinion polls. As urban dwellers are more often directly exposed to candidates and issues, we propose to use the degree of urbanization as a proxy for strategic uncertainty.

¹³ Note that there is a threshold to this that is defined by outcome uncertainty: if opinions polls show that one's preferred party has such little support in society that it has no chance of winning the elections, outcome uncertainty is so low that turning out becomes irrational.

Expected Costs of Voting (C)

Costs of the actual act of voting are registration requirements and the presence of sanctions for non-voting in democracies that have compulsory voting. We measure registration costs by calculating the proportion of registered voters as compared to the voting age population. Though providing an imperfect measure of registration costs, this measure can be used for all countries in the sample, even when information on registration procedures is scarce. In addition, we suggest that political violence might influence voter turnout in developing countries. As stress by Collier and Vicente (2008), illicit strategies such as bribery and intimidation were not just widespread but were used strategically in the Nigerian presidential election of 2007. They show that where a party adopted the strategy of violence it was effective, reducing the turnout of those who support other parties.

4.2. Implications

The above theoretical framework has three general implications for our empirical strategy. First, and foremost, we predict that media coverage and freedom foster voter turnout in developing countries. Moreover, we suggest that radio might have a larger impact on electoral participation than newspapers since it reduces the price of acquiring and processing information. Second, we expect the calculus of voting to function in the same way in developing countries than in developed countries. Hence we expect to find higher turnout in developing countries if benefits and outcome uncertainty are high, and low turnout if costs are high. Finally, apart from the variables affecting the calculus of voting identified in the existing literature, we expect several additional variables to play a role in developing countries. These are political violence, fairness of elections and limits of executive control indicated by high external debt and poor quality of bureaucracy. We expect to find higher turnout if political violence is low, elections are fair and executive control of policymaking is high. Appendix 1 summarizes our theoretical predictions.

5. Empirical Analysis

In this section, we test our theoretical predictions, focusing essentially on media coverage and freedom. We describe the data and discuss econometric issues. Then, we present our empirical results.

5.1. Variables and Data

The models used in much of the literature on voter turnout are cross-sectional in nature, insofar as mean turnout across a series of elections is depicted as a function of mean levels of the independent variables. Under this approach, scholars use data associated with each election for the time period under study, calculate the mean value for each variable, and then estimate a regression model with one observation for each national unit. Such an approach is somewhat limited since there is covariation in

turnout and key independent variables that occurs within countries over time.¹⁴ In this study, we use a pooled cross-sectional time-series model, whereby turnout in each country and each year is depicted as a function of independent variables measured at the time of each election. Hence it is possible to explain variation in turnout both across time and across countries. We have been able to collect data for 307 elections held in 60 developing countries between 1980 and 2005.¹⁵ As a measure of voter turnout, we use the percentage of the voting age population who cast a vote in national elections from 1980 to 2005, from the International Institute for Democracy and Electoral Assistance (IDEA). Appendix 2 provides an overview of the countries and elections years included in the sample.

The main independent variables of interest are media freedom and media access. As a measure of media freedom, we use Freedom House's media freedom score for each country. Freedom House assigns points to countries on the basis of three, equally-weighted categories related to media's independence from government. These three categories are: (i) legal environment, which looks at laws, statutes, constitutional provisions, and regulations that enable or restrict the media's ability to operate freely in a country; (ii) political environment, which evaluates the degree of political control over the content of news media in each country (such as editorial independence, official or unofficial censorship, harassment or attacks against journalists); (iii) economic environment, which includes the structure of media ownership, media-related infrastructure, its concentration, the impact of corruption or bribery on news media content, and the selective withholding or bestowal of subsidies or other sources of financial revenue on some media outlets by the state. This index considers TV, radio, newspaper, and the Internet.

To measure media coverage, we use three different variables with data from the World Development Indicators (World Bank, 2003) and the UNESCO Institute for Statistics. Press coverage is measured by daily newspapers average circulation per 1000 inhabitants.¹⁶ For radio coverage, we use the number of radio receivers per 1000 inhabitants. Television coverage is measured by the number of television sets per 1000 inhabitants.

With respect to the other independent variables, benefits are also measured by fragmentation at the time of the elections. We measure fragmentation by the number of parties running in the election which obtained at least 1% of votes, with data from the International Foundation for Electoral Systems (IFES) and the Database of political Institutions (DPI) of the World Bank (Beck and al., 2001). We use literacy rate as a

¹⁴ Other studies use survey data. However, there is a methodological challenge stemming from the sampling bias in survey research: survey respondents tend to vote at a higher rate than the real population. Indeed, non-voters tend to be more difficult to interview and some non-voters claim in surveys that they in fact have voted (Lutz, Marsh, 2007).

¹⁵ Data on turnout are available before 1980. However, given the availability of data on media coverage and media freedom, we have to restrict our study to elections held after 1980.

¹⁶ Newspapers' circulation is the number of copies distributed on average per day. Circulation is not always the same as copies sold, often called paid circulation, since some newspapers are distributed at no cost.

proxy for education, with data from the World Bank Indicators. Executive control of policymaking is measured by the external debt GDP ratio (World Bank Indicators) and the quality of bureaucracy (International Country Risk Guide).

The probability that voting will contribute to the preferred election outcome of voters is tested by impact uncertainty and outcome uncertainty. We use the degree of urbanization (WDI) as a proxy for impact uncertainty. Outcome uncertainty is measured by the closeness of elections, i.e. the difference in vote shares between the leading and second parties in each election. As data are not easily available for developing countries, we gather data from several sources: Inter Parliamentary Union (IPU), Elections around the World web site, International Institute for Democracy and Electoral Assistance (IDEA) and the Database of Political Institutions (World Bank). Outcome uncertainty is also measured by the fairness of elections. We introduce a dummy variable from the Database of Political Institutions that equals one when vote fraud or candidate intimidation is serious enough to affect the elections outcome.

Regarding the costs of voting, registration costs are measured by the proportion of registered voters as compared to the voting age population, with data from IDEA. Information on compulsory voting legislation is also collected from IDEA. Traditionally scholars have relied on a simple binary variable to measure compulsory voting laws, coded one in those country-year cases for which compulsory voting laws are present and zero otherwise. However, such a measure does not capture the full range of variation in types of compulsory voting across countries, since the enforcement of mandatory voting laws varies widely.¹⁷ We hypothesize that turnout will be highest when compulsory voting is accompanied by credible sanctions against noncompliance. To capture these effects, we develop a 4-point scale of compulsory voting. Countries with voluntary voting are scored as 0, countries with compulsory voting mandate but no sanctions against nonvoters written into law are scored as 1, compulsory systems possessing such legal sanctions but leaving them generally unenforced are scored as 2, and compulsory systems with legal sanctions that are enforced in practice are scored as 3. Appendix 2 presents the score for each country in the sample. Finally, political violence is captured by introducing a dummy variable that equals one during civil war and zero otherwise as provided by the PRIO Armed Conflict database. Appendix 3 presents the variables and their sources in detail.

5.2. Empirical Specification

The basic specification takes the following form:

$$TURN_{i,t} = a + \beta Info_{i,t} + \theta X_{i,t} + \tau_i + u_{i,t} \quad (3)$$

where $i = 1, \dots, N$ denotes countries and $t = 1, \dots, T$ denotes elections. $TURN_{i,t}$ stands for voter turnout rate in each i th country and each t th election. The main variable of

¹⁷ For example, in some countries, citizens are required to vote only if they register, but registration is not mandatory and the punishment for not voting is only a nominal fine. In other nations the law is taken much more seriously. In Peru, for instance, voters must carry a card for two months following an election to prove they have voted and may be denied access to public services if they do not.

interest is $Info_{i,t}$, which captures the influence of mass media. We will test the three types of media, as well as media freedom. τ_i and $u_{i,t}$ are respectively country fixed effects and the error term. Finally, $X_{i,t}$ is a vector of control variables. Among them, we include the variables that affect the calculus of voting as identified in our theoretical framework and described previously. In addition, we include other political and economic variables that are likely to affect voter turnout.¹⁸ We control for the level of development, measured by real per capita gross domestic product (GDP). The standard hypothesis to be tested is that economic development fosters turnout. The reasoning underlying this hypothesis is that economic development makes people more informed and engaged in the political process (Powell, 1982). It may not be only the level of economic development that matters but also the economic conjuncture at the time of the election. However, its effect on turnout is ambiguous. On the one hand, Rosenstone (1982) argues that economic adversity depresses turnout, because it disrupts the kind of social relationships that nurture political participation and induces people to withdraw from politics and focus on their personal concerns. On the other hand, Radcliff (1992) suggests that economic conjuncture affects turnout rates in developing countries differently than in industrialized democracies. In developing countries, economic performance is “inversely related to turnout so that when things are bad, citizens tend to vote in great numbers” (p. 445). Indeed, “the absence of security provisions leaves economic discontent to be politicized” (p. 446). Our indicator of economic conjuncture is the increase or decrease in per capita GDP in the election year, compared to the previous year. Finally, we control for the electoral system. The standard assumption is that turnout tends to be higher in proportional systems, for any of the following three reasons (Blais, Carty, 1990). First, it’s a fairer system; people feel less alienated and are thus more inclined to vote. Second, proportional system increases the number of parties and the variety of options among which people can choose. Third, proportional system makes elections more competitive: as there are many members to be collected in each district, most parties have a chance to win at least one seat, and as a consequence they attempt to mobilize electors throughout the country. Summary statistics of the variables are presented in Appendix 4.

Equation (3) can best be estimated as a panel, either using fixed effects or random effects. Both methods have their own assumptions. Using a random effects model assumes that all explanatory variables are uncorrelated with the individual specific effects. This is less likely for the empirical problem at hand. The fixed effects model control for omitted time-invariant country characteristics. However, a disadvantage of fixed effects model is that the impact of time-invariant or slowly changing variables such as institutional variables cannot be estimated. This is a cost in the context of this study since we are interested in the marginal effects of some time-invariant factors, such as electoral system and compulsory voting.

Hausman and Taylor (1981) derive an instrumental variables estimator that is between a fixed and a random effects approach. It allows the estimation of time

¹⁸ Appendix 3 presents these variables and their sources in detail.

invariant effects, without imposing the strong assumption that all variables should be uncorrelated with the individual specific effects. In the Hausman and Taylor (HT) model, exogenous variables (both time-variant and time-invariant) serve as their own instruments, time-varying endogenous effects (in the sense that they are correlated with individual specific effects) are instrumented by their deviation from individual means, and time-invariant endogenous effects are instrumented by individual averages of time-varying exogenous variables. The main challenge in the Hausman and Taylor model is deciding which of the variables are correlated with the individual specific effects and which are not. For this, Hausman and Taylor (1981) suggest mainly using economic intuition. If a variable is possibly correlated with other political, social, historical, cultural or economic aspects not included in the model, it is probably endogenous. In our specification, GDP per capita, electoral system, and our variables of media penetration and freedom can on this basis be considered as endogenous.

Besides economic intuition, formal tests can help decide what model to use and which variables to consider as exogenous. Specifically, Baltagi, Bresson and Pirotte (2003) provide a pretest estimator based on Hausman (1978) to choose between the fixed effects, random effects and HT estimator. Using this pretest estimator, we find that the HT model is preferred to the fixed effects model, which in turn is preferred to the random effects model. Nevertheless, to show robustness, we did conduct besides the HT model fixed effects panel regression results and we compare the regression results of the two models.

The Hausman specification test (1978) can also be used to decide which variables are to be treated as endogenous in the HT model. To apply this test, we rank on the basis of economic intuition variables from least to most exogenous. We next, following this list, instrument one variable at the time, up to the point where the Hausman test suggests that the HT model is no longer the most suited model. Using this method, we find that GDP per capita, electoral system, the variables of media penetration and freedom, and external debt can be considered endogenous, and the remaining variables exogenous.

5.3. Empirical Results

In this section, we present the results of the fixed effects and Hausman Taylor models. We first focus on the impact of media coverage on voter turnout. Then, we introduce the quality of information, as measured by the Freedom House index of media freedom.

5.3.1. Media Access and Voter Turnout

Table 1 below presents the basic results. We consider the effects of the three media variables defined in Section 5.1, namely newspapers circulation, radio receivers and television sets, expressed per 1000 inhabitants. A number of results stand out. First, as predicted, the three media variables have a positive effect on voter turnout in developing countries. Second, only the coefficient on radio ownership is statistically

significant. We suggest that this result is not surprising. Radio reduces the price of political information. Moreover, as citizens don't have to be able to read, they can more easily process information. To sum up, radio seems the best mean to acquire and process information necessary to decide how to vote in developing countries.

Considering the effects of the other elements in the calculus of voting model, the coefficients on fragmentation are positive but small and not statistically significant. We predicted that fragmentation increases the expected benefits of voting as more voters can find a party that matches their preferences. However, fragmentation also increases the complexity of the political system, which is why we don't find a significant positive impact on voter turnout. Literacy fosters turnout in developing countries. This confirms our prediction that education reduces the costs to process information. Finally, executive control seems to have the expected effect on turnout: as external debt is higher, turnout tends to be lower.

Turning to outcome uncertainty, both indicators, closeness and fairness, have the expected sign. This confirms our expectations that turnout is higher when outcome uncertainty is higher. Though not significant, closeness has a consistently negative coefficient in all models. Since a smaller value of closeness indicates closer, more competitive elections, this demonstrates that the closer are elections, the higher is turnout, confirming earlier findings in the literature on turnout in established democracies. In addition, electoral fraud has a negative and statistically significant impact on turnout. Hence, when voters face the choice of voting in elections that they consider unfair, they are less likely to turn out and vote, knowing that their vote is likely to have little bearing on the election outcome.

Considering the effects of costs on turnout, two results stand out. First, compulsory voting boosts turnout. Second, political violence negatively affects turnout in developing countries. Hence the security situation during the elections is an important determinant of electoral participation as violence increases the costs of voting associated with traveling to the polls.

Finally, the results concerning the control variables are interesting. First, economic development, measured by GDP per capita, seems to facilitate turnout in developing countries. Second, economic conjuncture doesn't impact significantly electoral participation. Moreover, contrary to Radcliff's (1992) argument that the relationship between economic growth and turnout will be negative in developing countries, we find that economic growth is positively related to turnout. Finally, proportional system has a clear positive and significant effect on electoral participation.

5.3.2. Media Freedom and Voter Turnout

We now investigate the effect of the quality of information on voter turnout in developing countries. We introduce the Freedom House index on media freedom in the basic specification. Table 2 below presents the results of the fixed effects and Hausman Taylor models.

Table 1: Media Coverage and Electoral Participation

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	FE	HT	FE	HT	FE	HT
Fragmentation	0.072 (0.53)	0.112 (0.63)	0.072 (0.54)	0.113 (0.62)	0.072 (0.53)	0.115 (0.63)
Literacy	0.820 (1.85)*	1.002 (1.90)*	0.814 (1.85)*	1.005 (1.90)*	0.819 (1.85)*	1.005 (1.90)*
Newspapers	0.755 (1.12)	0.890 (1.32)				
Radio			1.134 (2.56)**	1.255 (2.60)**		
TV					0.854 (1.30)	0.921 (1.31)
Debt	-0.200 (1.81)*	-0.321 (1.85)*	-0.215 (1.81)*	-0.213 (1.81)*	-0.224 (1.84)*	-0.324 (1.84)*
Bureaucracy quality	0.741 (1.20)	1.850 (1.12)	0.745 (1.25)	1.875 (1.13)	0.745 (1.21)	1.875 (1.15)
Closeness	-0.100 (1.20)	-0.123 (1.29)	-0.110 (1.30)	-0.125 (1.69)	-0.109 (1.60)	-0.125 (1.69)
Electoral Fraud	-1.005 (1.94)*	-1.115 (1.90)*	-1.005 (1.94)*	-1.115 (1.91)*	-1.004 (1.94)*	-1.114 (1.91)*
Urbanization	0.100 (0.75)	0.125 (0.70)	0.100 (0.74)	0.125 (0.71)	0.101 (0.74)	0.125 (0.74)
Registration costs	-0.450 (1.10)	-0.756 (1.00)	-0.450 (1.11)	-0.755 (1.01)	-0.450 (1.11)	-0.755 (1.01)
Compulsory voting		9.785 (3.88)***		9.560 (3.08)***		9.544 (3.11)***
Violence	-0.458 (1.86)*	-0.752 (1.82)*	-0.458 (1.86)*	-0.753 (1.83)*	-0.452 (1.85)*	-0.755 (1.85)*
GDP per capita (log)	1.630 (1.76)*	1.547 (1.80)*	1.630 (1.80)*	1.545 (1.81)*	1.631 (1.76)*	1.546 (1.80)*
Change in per capita GDP	0.400 (0.89)	0.456 (0.86)	0.402 (0.90)	0.455 (0.87)	0.402 (0.90)	0.455 (0.91)
Proportional system		1.856 (2.31)**		1.963 (2.20)**		1.865 (2.40)**
Constant	6.505 (2.51)**	7.401 (2.54)**	7.560 (2.50)**	8.120 (2.58)**	7.650 (2.55)**	8.630 (2.54)**
R ²	0.54	0.54	0.55	0.55	0.53	0.53
Countries	60	60	60	60	60	60
Observations	307	307	307	307	307	307

Robust t-statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 2: Media Freedom and Electoral Participation

Variables	(1) FE	(2) HT
Fragmentation	0.075 (0.54)	0.116 (0.62)
Literacy	0.815 (1.85)*	1.015 (1.90)*
Radio	1.004 (2.46)**	1.015 (2.50)**
Media freedom	1.530 (1.86)*	1.632 (1.84)*
Debt	-0.225 (1.81)*	-0.215 (1.81)*
Bureaucracy quality	0.745 (1.25)	1.875 (1.13)
Closeness	-0.116 (1.40)	-0.125 (1.59)
Electoral Fraud	-1.015 (1.84)*	-1.115 (1.91)*
Urbanization	0.100 (0.75)	0.125 (0.71)
Registration costs	-0.450 (1.01)	-0.755 (1.00)
Compulsory voting		9.550 (3.08)***
Violence	-0.458 (1.86)*	-0.753 (1.83)*
GDP per capita (log)	1.632 (1.80)*	1.545 (1.81)*
Change in per capita GDP	0.402 (0.90)	0.455 (0.87)
Proportional system		1.903 (2.20)**
Constant	7.960 (2.51)**	8.300 (2.58)**
R ²	0.56	0.56
Countries	60	60
Observations	307	307

Robust t-statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Two main results stand out. First, the impact of media freedom on voter turnout is consistent with our theoretical framework. It is large, positive and highly significant, even after controlling for a large set of variables. When mass media are freer, citizens participate politically and vote more. We suggest that media-provided information has higher value to citizens when government doesn't interfere with the media. Therefore, citizens are more prone to use this information to decide how to vote. Second, the

coefficients on radio ownership remain positive and statistically significant. Taken together, our findings suggest that both the amount and the quality of information affect positively electoral participation in developing countries.

6. Conclusions

Making governments more accountable and responsive to the needs of people is one of the most fundamental concerns of scholars and development practitioners. Obviously, competitive elections are a necessary component in the sequence of changes that lead to government accountability. In this paper, we argue that elections are an effective mechanism to discipline governments only if individuals show up at the polls to express their views. We offer a comprehensive analysis of voter turnout in developing countries and put light on the role of media-provided information. Our findings suggest that media penetration, measured by radio ownership, fosters electoral participation in developing countries, whereas newspapers circulation and television ownership don't have a significant impact. In addition, we show that when government owns a larger share of media outlets and infrastructure, regulates the media industry more, and does more to control the content of news, citizens are less politically active.

Our findings complement the recent literature on the role of mass media for development in two aspects. First, we suggest that both media coverage and freedom matter. Citizens need not only to have access to information but also to have confidence in media-provided information. When they have politically relevant information, citizens are more politically active. Second, radio seems the best mean to acquire and process information necessary to decide how to vote in developing countries.

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**Appendix 1: The Determinants of Electoral Participation in Developing Countries:
Theoretical Predictions and Open Questions**

Variables	Higher Turnout	Lower Turnout
Benefits B		
Fragmentation	x	
Education	x	
Media coverage	x	
Media freedom	x	
External debt		x
Bureaucracy quality	x	
Probability P		
Closeness of elections	x	
Fairness of elections	x	
Urbanization	x	
Costs C		
Registration costs		x
Compulsory voting	x	
Violence		x
Control variables		
Income	x	
Change in GDP		?
Proportional rule	x	

Appendix 2: Sample Characteristics

Countries	Elections Dates	Compulsory Voting ^a	Countries	Elections Dates	Compulsory Voting ^a
Algeria	91, 95, 97, 99, 2002, 2004	0	Lesotho	93, 98, 2002	0
Argentina	83, 89, 95, 99, 2003	2	Malawi	94, 99, 2004	0
Bangladesh	81, 86, 88, 91, 96, 2001	0	Malaysia	82, 86, 90, 95, 99, 2004	0
Barbados	81, 86, 91, 94, 99, 2003	0	Mali	92, 97, 2002	0
Belize	84, 89, 93, 98, 2003	0	Mauritania	92, 96, 2001, 2003	0
Benin	91, 96, 2001	0	Mauritius	83, 87, 91, 95, 2000, 2005	0
Bolivia	80, 85, 89, 93, 97, 2002, 2005	2	Mexico	82, 88, 94, 2000	1
Botswana	84, 89, 94, 99, 2004	0	Mozambique	94, 99, 2004	0
Brazil	82, 86, 89, 94, 98, 2002	2	Nepal	81, 86, 91, 94, 97, 99	0
Bulgaria	91, 92, 96, 97, 2001, 2005	0	Nicaragua	84, 90, 96, 2001	0
Burundi	93, 2005	0	Niger	93, 95, 96, 99, 2004	0
Cameroon	88, 92, 97, 2002, 2004	0	Panama	84, 89, 94, 99, 2004	0
Chile	89, 93, 99, 2005	2	Papua New G.	82, 87, 92, 97, 2002	0
Colombia	82, 86, 90, 91, 94, 98, 2002	0	Pakistan	85, 88, 90, 93, 97, 2002	0
Costa Rica	82, 86, 90, 94, 98, 2002	1	Peru	80, 85, 90, 95, 2000, 2001	2
Croatia	92, 95, 97, 2000, 2005	0	Philippines	87, 92, 95, 98, 2001, 2004	1
Dominican Rep.	82, 86, 90, 96, 2000, 2004	1	Poland	90, 95, 2000, 2005	0
Ecuador	84, 88, 92, 96, 98, 2002	2	Romania	92, 96, 2000, 2004	0
Egypt	84, 87, 90, 95, 2000, 2005	2	Russia	91, 96, 2000, 2004	0
El Salvador	84, 89, 94, 99, 2004	0	Senegal	83, 88, 93, 96, 2000	0
Ethiopia	92, 2000, 2005	0	Sri Lanka	82, 88, 94, 99, 2005	0
Gambia	82, 87, 92, 96, 2001	0	Togo	85, 90, 94, 98, 2003, 2005	0
Ghana	92, 96, 2000, 2004	0	Thailand	83, 86, 88, 92, 95, 96, 2001, 2005	1
Guatemala	82, 85, 90, 91, 95, 99, 2003	1	Trinidad & T.	81, 86, 91, 95, 2000, 2001, 2006	0
Honduras	81, 85, 89, 93, 97, 2001, 2005	1	Tunisia	81, 86, 89, 94, 99, 2004	0
Hungary	90, 94, 98, 2002	0	Turkey	83, 87, 91, 95, 99, 2002	2
India	80, 84, 89, 91, 96, 98, 99, 2004	0	Uruguay	84, 89, 94, 99, 2004	3
Indonesia	82, 87, 92, 97, 99, 2004	0	Venezuela	83, 88, 93, 98, 2000	1
Jordan	89, 93, 97, 2003	0	Zambia	91, 96, 2001	0
Kenya	92, 97, 2002	0	Zimbabwe	80, 85, 90, 96, 2002	0

^a Countries with voluntary voting are scored as 0, countries with compulsory voting mandate but no sanctions against nonvoters written into law are scored as 1, compulsory systems possessing such legal sanctions but leaving them generally unenforced are scored as 2, and compulsory systems with legal sanctions that are enforced in practice are scored as 3.

Appendix 3: Data Description

Dependent Variable	Indicators	Sources
Voter Turnout	Percentage of voters on voting age population	International Institute for Democracy and Electoral Assistance (IDEA)
Independent Variables		
Benefits B		
<i>Availability of choice</i>		
Fragmentation	The number of parties running in the election which obtained at least 1% of votes	Database of Political Institutions (World Bank) International Foundation for Electoral Systems (IFES)
<i>Voter's confidence</i>		
Literacy	The proportion of the population aged 15 years and older that can read and write	World Bank (WDI)
Media coverage	Daily newspapers: average circulation per 1000 inhabitants Radio receivers per 1000 inhabitants Television sets per 1000 inhabitants	UNESCO Institute for Statistics World bank (WDI)
Media freedom	Freedom House index of media freedom. Each country is rated in three areas of potential state influence over the media: legal environment, political influences and economic pressures, to determine an overall score. Score rescaled from 0 to 1 where a higher score means more freedom.	Freedom House
<i>Executive control</i>		
External debt	External debt as % of GDP	World Bank (WDI)
Bureaucracy quality	Bureaucracy index scored from 0 to 6. High scores indicate autonomy from political pressure, strength and expertise to govern, established mechanisms for recruiting and training	International Country Risk Guide (ICRG)

Appendix 3 (continued)

Probability P		
<i>Outcome uncertainty</i>		
Closeness of elections	The difference in vote shares between the leading and the second parties	IDEA Database of Political Institutions (World Bank) IPU PARLINE Database Elections around the World web site
Fairness of elections	A dummy that equals one when vote fraud or candidate intimidation is serious enough to affect the elections outcome	Database of Political Institutions (World bank)
<i>Strategic uncertainty</i>		
Urbanization	Percentage of the total population living in the urban areas.	World Bank (WDI)
Costs C		
Registration costs	Percentage of individuals registered over the voting age population	IDEA
Compulsory voting	Degree to which appearance at the polls is mandated by the state. Countries with voluntary voting receive a score of 0, countries with a compulsory voting statute but no sanctions written into law receive a score of 1, compulsory systems possessing such legal sanctions but leaving them generally unenforced receive a score of 2, and compulsory systems with legal sanctions that are enforced in practice receive a score of 3.	IDEA
Political violence	A dummy equals one during civil war.	PRIO Armed Conflict database
Control variables		
Income	Real GDP per capita in constant 1995 US dollars	World Bank (WDI)
Electoral system	A dummy variable which equals one when the election was held under the proportional representation rule	Database of political Institutions (World Bank)

Appendix 4: Descriptive Statistics

Variables	Observations	Mean	St. Dev.	Minimum	Maximum
Turnout	307	57	14	30	91
Fragmentation	307	3.75	1.75	2	8
Literacy	307	70	35.7	55	90
Newspapers (per 1000)	307	142.44	85.5	2	400
Radio (per 1000)	307	150	90.7	3	720
Television (per 1000)	307	130	80.1	1	620
Media freedom	307	0.4	0.6	0.1	0.9
Bureaucracy quality	307	3.1	1.7	0.5	5
Closeness	307	9.70	8.02	0.6	35
Fairness	307	0.52	0.49	0	1
Urbanization	307	47.5	25.10	10	85
Registration costs	307	65	20.7	30	95
Compulsory voting	307	0.45	1.05	0	3
Political violence	307	0.15	0.32	0	1
Income per capita	307	4061	3201	171	18390
Proportional system	307	0.60	0.3	0	1