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ABSTRACT

This paper's objective is to investigate the effects of internet access on voter behavior in governor elections at the state level in consolidating democracy. Using a fractional probit model for panel data, we analyze the electoral outcomes in 31 Mexican states and Mexico City during state/city governor elections between 1999 and 2015. The evidence suggests that, in environments where traditional media might be captured by government (1) an increase in government expenditure growth in the year before elections increases the incumbent party's vote share, and (2) in contrast, an increase in the portion of the population that has access to the internet reduces it. Not surprisingly, these effects seem to diminish as more broadcast companies enter the market. Unlike previous studies, this paper considers how changes in the market conditions (industry concentration and technology) of news supply, and their resulting effects on media freedom, influence voters.

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Political economy of the internet; political economy of media; media freedom; voting

1. Introduction

With the arrival of the internet and social media, and their apparent relation to the democratization of certain countries around the world, the interest in their political and economic effects, especially in feeble democracies, has been recently increasing. However, the economic literature that has flourished with them has not yet reached a consensus on whether the internet and social media are beneficial or detrimental for democracies.¹

In contrast with traditional media, the internet enjoys more freedom (Miner, 2015). In addition, media freedom has been found to reduce incumbent engagement in rent-seeking activities; for example, more media freedom is linked to a decrease in corruption (Brunetti & Weder, 2003; Jha & Sarangi, 2017). In this vein, in works related to the political budget cycle (PBC), we learn that opportunistic behavior, like the expansion in government spending before elections (Drazen, 2001; Nordhaus, 1975), is disincentivized by the presence of media freedom because incumbents know that there is a greater risk of being caught (Akhmedov & Zhuravskaya, 2004; Ademmer & Dreher, 2015; Veiga et al., 2017). However, the question about voters remains, how do they react to the information

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¹Although some argue that social media and the internet exacerbate political polarization (Pariser, 2011; Sunstein, 2017), there are studies that show there is no substantial empirical evidence to this claim (Boxell, Gentzkow, & Shapiro, 2018). Conversely, others argue that the internet and social media have helped in the democratization of developing countries (Acemoglu, Hassan, & Tahoun, 2015; Miner, 2015).

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provided by media with more liberty? Consequently, in our analysis, we part from the theory of the Political Budget Cycle (PBC) and use its proposition on voter behavior as a medium to test the effects of the differences in press freedom of traditional and internet media. We use the PBC theory because of the evidence found in previous studies for Mexico at the state level, and to account for incumbent's manipulative strategies to remain in power.

According to a strand of this theory called the rational expectations model, there is an asymmetry of information between the incumbents and the electorate; that is, only incumbents can observe their own capabilities to govern. Therefore, voters try to assess whether to replace politicians or not by observing signals, like economic performance. Incumbents know this and try to signal competence by manipulating fiscal policies. Consequently, voters end up rewarding the opportunistic increases in expenditure by the government (Persson & Tabellini, 1990; Rogoff, 1990; Rogoff & Sibert, 1988).

Does internet access help to reduce this information gap? According to some studies, better-informed voters behave like *fiscal conservatives* (Peltzman, 1992; Shi & Svensson, 2006; Vergne, 2009), punishing incumbents rather than rewarding them (Akhmedov & Zhuravskaya, 2004; Drazen & Eslava, 2010; Nordhaus, 1975) if they engage in rent-seeking activities.² However, voters depend heavily on access to a free and plural media to monitor incumbents and penalize the opportunistic spending (Eslava, 2011).

On the other hand, according to the literature on the political economy of mass media, a highly concentrated media industry increases the probability that governments capture news providers and, consequently, affect electoral outcomes because voters rely on information supplied by the media to decide whether to reelect an incumbent (Besley & Prat, 2006). In this line of thought, in comparison to traditional broadcast media, the internet is more expensive to capture for the government and is available to only a fraction of the population (Miner, 2015), especially in developing countries. Intuitively, in a scenario with high media industry concentration, captured mainstream media would be biased in favor of the incumbent and against the opposition. Internet media, in contrast, could provide negative information about incumbents, i.e., bad news about the ruling party, and good news about the opposition.

Altogether, in the context of the political budget cycles, media capture by the government would hinder voters to identify opportunistic spending, increasing the incumbent's party vote share. In these environments, the internet would have a negative effect on incumbent's votes because it would provide unfavorable information about incumbents, as digital media enjoys more freedom. However, we could expect that the positive effect of spending on the incumbent's votes would diminish if the probability of media capture by government decreases.

The evidence of this study suggests that an expanding spending increases the incumbent party's vote share, as predicted by the PBC theory. Conversely, an increase in internet access reduces their vote share, even after controlling for economic performance, local TV market conditions, political alignment with the presidency, and correlation with time and education. In addition, we find that the positive influence on incumbent's votes of government spending is significantly reduced as the number of local TV companies

²An alternative explanation is that voters behave as fiscal liberals when the structure of the fiscal federalism causes voters to perceive that the cost of the increased spending is passed on to someone else, like in Argentina (Jones et al., 2012).

increases, reducing the risk of government influence on electoral outcomes. More broadly, the evidence suggests that in consolidating democracies, local market conditions of news supply are important for the effectiveness of the manipulation of fiscal policies by incumbents to remain in power.

Mexico is a good natural laboratory to explore our question of interest because of its democratic conditions, restricted media freedom, and internet access heterogeneity. Although democratic progress has been achieved, Mexico can be described as a flawed,³ relatively young,⁴ and partially free⁵ democracy. According to some international organizations – such as Freedom House, Reporters without Borders, and Article 19 – the main challenges the country must still overcome are the overshadowing of legislative and judiciary powers by the presidency, the lack of a fully regulated system of political competition, and politically motivated violence.

Despite the violence against independent media, journalists' assassinations,⁶ and government censorship that compromise journalistic freedom in Mexico,⁷ a major threat to the freedom of broadcast media is the elevated market concentration rate. The TV broadcast industry in Mexico has been traditionally dominated by two companies. The two major TV networks, Televisa and TV Azteca, which are the principal sources of information for most of the country, control almost the entire television market. Freedom House (FH), an international independent watchdog organization, reported that both companies together received 25% of the total federal resources allocated for official advertising in 2016, estimated at about \$400 million. This discriminatory use of public advertising funds is considered a “subtle/soft censorship.”⁸

At the state level, the picture looks very similar: Televisa and TV Azteca dominate most of the local TV markets by retaining most of the broadcast power per state and having a local station in almost every state (see Table 1). The average of an industry concentration index indicates a perfect duopoly. Additionally, most of the states have only two mainstream media companies.

Unlike traditional broadcast media, internet media enjoys more freedom (Miner, 2015). In fact, freedom of the press has been ranked as “not free” since 2010, while Mexico's internet freedom is classified as “partially free.”⁹ However, Mexico is still behind other OECD countries in terms of internet access for the population, and access has not spread equally throughout the country. A high diversity persists among the states. For example, northern states like Nuevo Leon and Baja California Sur, as well as Mexico City (located in the center), have much higher penetration rates than southern states like Chiapas, Oaxaca, and Tabasco (see Figure 1).

In brief, these three factors – a weak democracy, high internet heterogeneity, and highly probable government capture of traditional broadcast media – create an important background for our study and qualify Mexico as a good laboratory for testing our hypothesis.

³See Economist Intelligence Unit: www.eiu.com.

⁴CSP (2010). Polity IV Country Report 2010: Mexico. Center for Systemic Peace. Retrieved from: www.systemicpeace.org.

⁵See Freedom House: www.freedomhouse.org.

⁶Freedom House 2016 report describes Mexico as one of the world's most dangerous places for journalists and media workers (see www.freedomhouse.org). Article 19 reports 11 assassinated journalists by 11 December 2016 (see www.article19.org).

⁷See Reporters Without Borders (RSF): www.rsf.org.

⁸See Article 19 (27 March 2014). Mexico: “Soft” censorship poses significant dangers to press freedom. *Article 19*. Retrieved from: www.article19.org.

⁹See Freedom House: www.freedomhouse.org.



Table 1. Local TV Market Companies and Broadcast Power HHI. Source: Own elaboration with information from Mexico's Federal Institute of Telecommunications (IFT). Note: Instituto Politécnico Nacional (IPN), Multimédios (MM), Herfindahl Index (HHI) is defined as the sum of the squares of the shares, normally used to measure market concentration.

State	Total Broadcast Power in kW (share)						Total Local TV Companies	Broadcast Power-HHI
	Televisa	TV Azteca	IPN	MM	Others			
Aguascalientes	480 (93.0%)	36.03 (7.0%)					2	8701
Baja California	1569 (47.1%)	866.5 (26.0%)	78.96 (2.4%)		813.64 (24.4%)		7	3504
Baja California Sur	172 (61.6%)	107.01 (38.4%)					2	5271
Campeche	105 (59.4%)	71.65 (40.6%)					2	5178
CDMX	1080 (68.7%)	127.92 (8.1%)	104.05 (6.6%)		259.29 (16.5%)		6	5107
Chihuahua	823 (47.5%)	475.75 (27.4%)	298.57 (17.2%)		136.02 (7.8%)		8	3366
Chiapas	734 (77.1%)	218.45 (22.9%)					2	6465
Coahuila	1071.9 (66.6%)	460.21 (28.6%)	9.08 (0.6%)	47.5 (3.0%)	21.3 (1.3%)		7	5260
Colima	232 (74.9%)	77.83 (25.1%)					2	6238
Durango	204.58 (70.9%)	41.81 (14.5%)	24.27 (8.4%)		18 (6.2%)		5	5342
Guerrero	473 (68.9%)	213.12 (31.1%)					2	5717
Guanajuato	540 (72.9%)	199.6 (27.0%)					6	6044
Hidalgo	45 (75.0%)	15.03 (25.0%)					2	6246
Jalisco	822 (64.9%)	256.32 (20.2%)					2	4763
México	1268 (87.1%)	184.82 (12.7%)	2.82 (0.2%)	47.5 (3.8%)	140 (11.1%)		5	7749
Michoacán	1111.4 (62.0%)	380.55 (21.2%)					3	4578
Morelos	45 (8.2%)	478.04 (87.6%)	22.92 (4.2%)		300 (16.7%)		3	7752
Nuevo León	1000 (77.3%)	181.787 (14.1%)		111.675 (8.6%)			3	6249
Nayarit	163.34 (77.3%)	47.97 (22.7%)					2	6490
Oaxaca	755.929 (65.4%)	399.67 (34.6%)					2	5475
Puebla	115 (44.9%)	141.27 (55.1%)					2	5053
Quintana Roo	236 (56.0%)	99.3 (23.5%)			86.39 (20.5%)		4	4106
Querétaro	560 (48.1%)	599.92 (51.5%)			5 (0.4%)		3	4963
San Luis Potosí	793.6 (77.9%)	116.97 (11.5%)	22.52 (2.2%)		85.673 (8.4%)		4	6276
Sinaloa	986 (66.2%)	240.75 (16.2%)	262.96 (17.7%)				3	4954
Sonora	1154 (73.4%)	336.02 (21.4%)			82.46 (5.2%)		4	5870
Tabasco	401 (59.7%)	38.64 (5.8%)			232.3 (34.6%)		5	4790
Tamaulipas	2291 (69.3%)	600.59 (18.2%)		165.34 (5.0%)	250 (7.6%)		4	5212
Veracruz	1935 (75.9%)	614.44 (24.1%)			1402 (0.1%)		4	6335
Yucatán	310 (42.0%)	205.17 (27.8%)			222.64 (30.2%)		4	3449
Zacatecas	440 (81.4%)	100.36 (18.6%)			Not available		5	6975
							2 (mode)	5596 (mean)

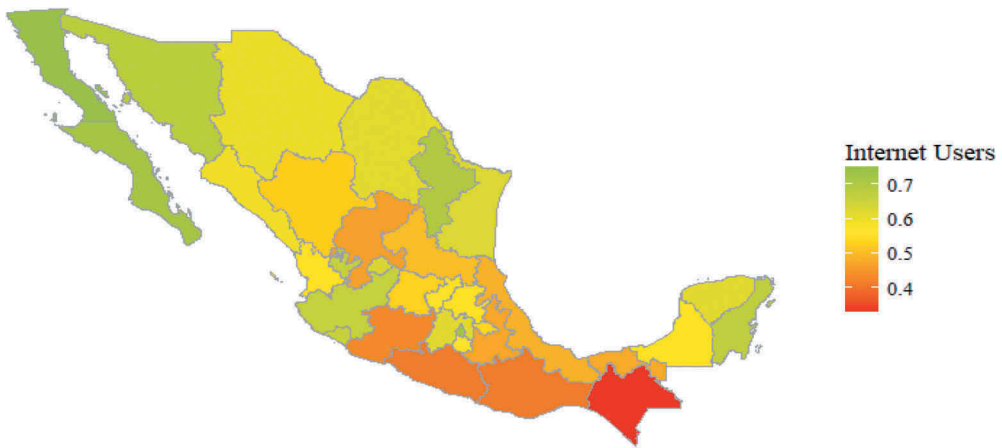


Figure 1. Percentage of Internet Users per State, 2015. Source: Own elaboration with information from INEGI.

The PBC theory and main conclusions from the political economy of mass media are reviewed in Section II. The econometric model and data are discussed in Sections III and IV, respectively. We examine and discuss the results and their limitations in Sections V and VI. Finally, Section VII explores the main conclusions and suggests future pathways for research.

2. The political budget cycle and political economics of mass media

Though this study parts from the PBC and builds upon the political economy of the internet, it is also related to other literature in economics and political science, such as the political economy of mass media, economic voting, public choice, and political accountability.

2.1. The political budget cycle, media freedom and voters

The political business cycle theory studies the economic distortions stimulated by the recurrence of elections. Under a strand of this theory, incumbent governors have incentives to remain in power. They engage in the manipulation of public policies (e.g., an increase in social transfers, a decrease of taxes, etc.) prior to elections to persuade voters to keep them in power (Nordhaus, 1975), even at the cost of an economic downturn after elections and in the long term.

Former studies focused on the effect of elections on the real economy (e.g., GDP growth rates, unemployment), but recently they have shifted toward policymakers' instruments, such as fiscal policies (i.e., government expenditure and taxes). Drazen (2001) argues that there are at least two good reasons to focus on fiscal policy manipulation rather than real economy effects: first, the lack of empirical evidence of effects on the real economy, and second, the government's limited direct control over real variables. Moreover, the composition of spending may be a subtler, easier, more visible, and more

powerful way for incumbents to frame electoral cycles (Alesina, Roubini, & Cohen, 1997). Consequently, studies have focused on what the literature identifies as PBC.

Previous studies suggest that the existence of PBC is a phenomenon of young democracies, but recent studies find evidence of budget cycles also in established democracies (Ademmer & Dreher, 2015; De Haan & Klomp, 2013; Eslava, 2011). Discussion is now turning toward identifying and analyzing specific conditions that induce the PBC to prevail.¹⁰

A group of studies that analyze sophisticated voters and media find evidence of a negative relation between informed voters/media freedom and the amplitude of the cycles, regardless of the level of the country's development. In other words, the magnitude of the PBC diminishes as the proportion of informed voters increases (for developed countries, see Ademmer & Dreher, 2015; for developing countries, see Akhmedov & Zhuravskaya, 2004; Vergne, 2009; for both, see Shi & Svensson, 2006).

Vergne (2009), for instance, investigates the electoral composition changes in public spending, analyzing 42 developing countries (Mexico included) with data from 1975 to 2001. He finds that public spending during an election year adjusts toward more observable expenditures, such as transfers and subsidies, and away from less notable expenditures such as capital investments. In addition, he concludes that a greater share of informed voters leads to smaller alterations in the distribution of public spending during electoral years. Vergne (2009) uses “radios per capita” multiplied by a “freedom of broadcasting” indicator to proxy informed voters.

For developed countries, Ademmer and Dreher (2015) study this phenomenon in 25 countries of the European Union using data from 1996 to 2012. They show that European governments commonly generate PBC, and the interaction of fiscal institutions and media strength explains the amplitude of the cycles. The researchers argue that fiscal rules help to reduce PBC only in countries with weak media; such rules fail to have a significant effect where the press is strong. They suggest that a strong, free media generates high political pressure for governments to avoid being corrupt, while countries with weak media have a greater possibility of malfeasance. Their conclusion is that a strong press, which has the resources to conduct journalistic research, can reach and inform voters, and is free to report government wrong-doing, is paramount to eradicate the PBC.

Although there seems to be a consensus that media freedom prevents incumbents from engaging in fiscal policy manipulations, there is an ongoing debate on voter behavior. Traditional models assume that short-sighted and naive voters have adaptive expectations, which are independent of an incumbent's ideology (Nordhaus, 1975). In these models, voters do not learn from the past; they have forgotten the previous post-electoral recession by the time the next election approaches. This would imply that voters always reward opportunistic spending. But these assumptions – naïve voters who are incapable of learning and predisposed to regular mistakes in expectations – are unconvincing (Alesina et al., 1997).

¹⁰Some factors that have been explored in empirical studies are: the level of development (Shi & Svensson, 2006); level of democracy (Brender & Drazen, 2005; Gonzalez, 2002); fiscal transparency and fiscal rules (Alt & Lassen, 2006; Alt & Rose, 2009; Rose, 2006; Stanova, 2012); electoral rules (Persson & Tabellini, 2003); presence of checks-and-balances systems (Streb, Lema, & Torrens, 2009); sophisticated (experienced and informed) voters (Shi & Svensson, 2006); and media freedom (Ademmer & Dreher, 2015; Akhmedov & Zhuravskaya, 2004; Vergne, 2009).

Other models assume rational expectations where there is an asymmetry of information about the incumbent's competence between voters and politicians (Persson & Tabellini, 1990; Rogoff, 1990; Rogoff & Sibert, 1988). Politicians are better informed about their own capabilities than citizens. Voters infer an incumbent's competence by observing signals, such as economic performance. Incumbents take advantage of this asymmetry of information and try to be perceived as highly competent by manipulating public policies, which leads to economic cycles. Politicians' true competency is revealed to voters only after elections. However, in this signaling game, the most competent incumbents implicitly generate the sharpest business cycles in the separating equilibrium, and only they are reelected. In other words, the price for selecting the most competent politicians is the rational opportunistic cycle. These models are difficult to test because of the unobservable candidates – those who don't get reelected.

A third group of studies (Lohmann, 1998; Mink & de Haan, 2006; Persson & Tabellini, 2000; Shi & Svensson, 2006) argue in favor of a moral hazard model in which not even the incumbents know their own competence. This model posits that incumbents' capabilities are revealed to everyone, including incumbents themselves, only after elections. Particularly, politicians are not certain prior to the election about their own ability to handle future difficulties. Consequently, all kinds of incumbents, and not only the most competent, generate budget cycles. This assumption allows the study of these models. However, an implication of the moral hazard models is that electoral cycles do not improve an incumbent's chance of reelection because voters anticipate this opportunistic behavior from all incumbents.

Regardless of the theory, what does the empirical evidence show? One group of studies (Akhmedov & Zhuravskaya, 2004; Veiga & Veiga, 2007; Drazen & Eslava, 2010; Aidt, Veiga, & Veiga, 2011; Balaguer, Brun, Forte, & Tortosa, 2015) shows that voters reward opportunistic fiscal manipulation. Conversely, some evidence for voters behaving as fiscal conservatives, i.e., punishing opportunistic increments in government spending (Alesina, Perotti, & Tavares, 1998; Besley & Case, 1995; Brender, 2003; Peltzman, 1992), has been found in Latin America (Kraemer, 1997), Israel (Brender, 2003), Colombia (Eslava, 2005), Brazil (Litschig & Morrison, 2012), and for countries with high and low levels of democracy (Mourão & Veiga, 2010).

Alternatively, Jones, Meloni, and Tommasi (2012) argue that voters behave as fiscal liberals if they can pass the cost of the increased government spending in their districts to someone else. They find evidence that in countries with centralized fiscal regimes like Argentina, voters reward governors who could obtain more funds for their districts from the national government.

While there is an ongoing discussion on voter behavior, Eslava's (2011) literature review concludes that there is scarce evidence supporting the assumption that voters reward high-deficit governments, suggesting that voters are mostly fiscal conservatives and, more importantly, that the electorate depends on whether they can effectively monitor government behavior to punish opportunistic incumbents.

In the case of Mexico, robust evidence of the PBC has been found at the federal level (Flores, 2007; Gonzalez, 2002) and state level (Amarillas & Gámez, 2014; Gámez & Ibarra-Yúnez, 2009; Ramirez & Erquizio, 2012). State-level studies find an expansion in state spending during election years. But Amarillas and Gámez (2014) conclude that this rent-seeking behavior does not increase incumbents' probability of being reelected.

2.2. *The economics of mass media*

This study also contributes to the literature on the economics of mass media, a flourishing field of research.¹¹ Among the theoretical studies, Besley and Prat (2006) develop a model for political accountability and mass media. The government can capture the media endogenously and, thus, influence election results. In addition, voters decide to reelect incumbents based on available information. The information is endogenous; the media industry provides it to the electorate. One of the main predictions is that changes in market concentration affect voters' welfare. Media capture affects voters' welfare in two ways: first, it increases the probability that politicians will take part in rent-seeking activities because they know they are less likely to get caught; and second, bad politicians are less likely to be identified and hence replaced. Media pluralism prevents the news providers from being captured by the government. Intuitively, the larger the number of independent media, the lower the probability of the government controlling the information supply. In this vein, Leeson (2008) finds that for a group of 60 countries media capture reduces citizen's political knowledge and participation.

In addition, some studies find that the media have a significant power of political persuasion in countries with feeble democratic institutions (Enikolopov, Petrova, & Zhuravskaya, 2011). Others find that media effects on voting are significantly high in environments where an independent news provider enters a market in which current news outlets are captured by the government (Strömberg, 2015).

Focusing on the internet, Miner (2015) studies its effect on the state elections of 2008 in Malaysia, where the media is controlled by the government. According to this study, the internet growth explains almost half the total swing in percentage points against the incumbent party. The author compellingly argues that the internet differs from traditional media sources in that it is too expensive to be captured¹² and that internet media allow voters to better perceive the negative signals of an incumbent's competence, neutralizing media controls. He concludes that the internet facilitates democratization by preventing information monopolies.

Studies for Mexico, mainly in the political science literature, find convincing evidence of media bias during presidential elections (particularly for TV: Camp, 2013; Greene, 2011; Lawson & McCann, 2005; Martínez-Garza, González-Macías, & Miranda-Villanueva, 2015), media influence on voting outcomes, and the media's strong political persuasion on voters (Larreguy, Marshall, & Snyder, 2014, 2016). Furthermore, Camp (2013) and Díaz-Domínguez and Moreno (2015) evaluate social media effects on voting during the 2012 elections. These studies find that social media users are highly educated, have higher incomes, and are more interested in politics. Social media users were more likely to vote for PRD candidates in 2012, even though the TV networks were biased in favor of the PRI (the PAN held the presidency during that election).

¹¹In this area, there is a growing number of empirical studies that focus on the political persuasion of mass media (Adena, Enikolopov, Petrova, Santarosa, & Zhuravskaya, 2015; DellaVigna & Kaplan, 2007; Durante & Knight, 2012; Enikolopov et al., 2011; Gentzkow & Shapiro, 2011; Miner, 2015); the role of mass media in shaping political and economic outcomes (Besley & Burgess, 2002; Freille, Haque, & Kneller, 2007; Gentzkow, Glaeser, & Goldin, 2004; Snyder & Strömberg, 2010); the political economy of the internet (Campante, Durante, & Sobbrío, 2013; Enikolopov, Petrova, & Sonin, 2012; Gentzkow & Shapiro, 2011); and media bias (Besley & Prat, 2006; Gentzkow & Shapiro, 2005). For a thorough review of literature on media and politics, see Strömberg (2015).

¹²The author argues that the internet is expensive to regulate because of its diffuse nature, and from an economic view, web censorship by the government will disincentive foreign direct investment (FDI).

3. Data

In Mexico, state governor elections are held every 6 years and are coordinated by the Autonomous Electoral Institute (IEE) of each state. Most state elections are held in mid-year, and a few are held during the first quarter of the year. Table 2 displays the full sample of state elections considered in this study.

Although local congresses maintain the power to modify electoral laws and therefore election years, in our sample, we have only four “extraordinary elections”: those held 1 year before or 1 year after the regular time. In one case, the election results were annulled because of some irregularities, and the IEE called for new elections the next year (Tabasco 2001). In another case, the governor resigned during his mandate (Guerrero 2015). In the last two cases, the state was looking to match its electoral year to the majority of state elections in the country (Hidalgo and Quintana Roo 2010). Even though, we control for these extraordinary elections in our estimations, we don’t report the results because the objective is to reduce its noise, not to observe their effect.

Finally, it is worth noting the following: (1) the majority of the incumbents in our sample were from the centrist PRI party (60%), followed by the right-of-center PAN (25%) and lastly, the left-of-center PRD (15%), as shown in Table 3;¹³ (2) our sample covers two complete PAN presidential administrations (Vicente Fox, 2000–2006 and Felipe Calderón, 2006–2012) and two partial PRI presidential administrations (the last two years of Ernesto Zedillo, 1994–2000, and the first 3 years of Enrique Peña, 2012–2018); and (3) 67 out of 88 elections in our sample were held during a PAN presidential term, state incumbents also belonged to PAN in 18 of these; conversely, of the remaining 21 elections held during a PRI presidency, state incumbents were also PRI in 15.

Most information for the 31 states and Mexico City was collected from different databases of INEGI, the Mexican Institute of Statistical Information. Table 4 displays a summary of the variables, their descriptions, and sources.

The information on internet users was obtained from INEGI’s ENDUTIH¹⁴ survey (2001–2002, 2004–2015)¹⁵; this variable is defined as the fraction of the state population that has accessed the internet inside or outside their house in the past 12 months. The education was also obtained from this database and is defined as the fraction of the state population that has at least a bachelor’s degree. While alternative definitions of education could be used, we are most interested in controlling for the effect of the most-educated population, as they are most likely to use the internet.

The state’s annual expenditure growth was also obtained from INEGI. Total spending includes electoral spending: the budget given to the political parties during election years. We deducted electoral expenditure from total spending, as it does not reflect an opportunistic expense. Any other expenditure that was not originally meant to be used for electoral purposes and helps incumbent parties to increase their vote share could be considered as an

¹³During the time period covered in our sample, there were some candidates running for state governor in coalitions with one or more political parties; however, we did not identify any significant effect of whether there was a coalition with the incumbent, opposition, or both.

¹⁴Encuesta Nacional sobre Disponibilidad y Uso de las Tecnologías de la Información en los Hogares; information obtained from this survey is representative at the state level starting from 2010. Results should be interpreted with caution.

¹⁵For missing state elections data for years 1999 (Baja California Sur, Coahuila, Guerrero, Hidalgo, México, Nayarit, and Quintana Roo) and 2000 (Chiapas, Guanajuato, Jalisco, Morelos, and Tabasco), 2001 data were used. Similar results are obtained if we remove these observations.

Table 2. State Elections. Source: Own elaboration with information from State Electoral Institutes (States' IEE). Note: Extraordinary elections – those held before the standard six-year governor tenure or that were invalidated and held again – are indicated with an asterisk (*).

State	Election Year (t)	Year before Elections (t-1)
Aguascalientes	2004, 2010	2003, 2009
Baja California	2001, 2007, 2013	2000, 2006, 2012
Baja California Sur	1999, 2005, 2011	1998, 2004, 2010
Mexico City	2000, 2006, 2012	1999, 2005, 2011
Campeche	2003, 2009, 2015	2002, 2008, 2014
Chiapas	2000, 2006, 2012	1999, 2005, 2011
Chihuahua	2004, 2010	2003, 2009
Coahuila	1999, 2005, 2011	1998, 2004, 2010
Colima	2003, 2009, 2015	2002, 2008, 2014
Durango	2004, 2010	2003, 2009
Guanajuato	2000, 2006, 2012	1999, 2005, 2011
Guerrero	1999, 2005, 2011, 2015*	1998, 2004, 2010, 2014
Hidalgo	1999, 2005, 2010*	1998, 2004, 2009
Jalisco	2000, 2006, 2012	1999, 2005, 2011
Michoacán	2001, 2007, 2011	2000, 2006, 2010
Morelos	2000, 2006, 2012	1999, 2005, 2011
México, State of	1999, 2005, 2011	1998, 2004, 2010
Nayarit	1999, 2005, 2011	1998, 2004, 2010
Nuevo León	2003, 2009, 2015	2002, 2008, 2014
Oaxaca	2004, 2010	2003, 2009
Puebla	2004, 2010	2003, 2009
Querétaro	2003, 2009, 2015	2002, 2008, 2014
Quintana Roo	1999, 2005, 2010*	1998, 2004, 2009
San Luis Potosí	2003, 2009, 2015	2002, 2008, 2014
Sinaloa	2004, 2010	2003, 2009
Sonora	2003, 2009, 2015	2002, 2008, 2014
Tabasco	2000, 2001*, 2006, 2012	1999, 2000, 2005, 2011
Tamaulipas	2004, 2010	2003, 2009
Tlaxcala	2004, 2010	2003, 2009
Veracruz	2004, 2010	2003, 2009
Yucatán	2001, 2007, 2012	2000, 2006, 2011
Zacatecas	2004, 2010	2003, 2009

opportunistic tool.¹⁶ Therefore, the state annual expenditure growth was calculated using the difference of the total annual expenditures minus the electoral spending.¹⁷

State GDP (1999–2006, 2003–2015) was also obtained from INEGI. We calculated GDP per capita¹⁸ using population data from CONAPO (Consejo Nacional de Población). GDP series were chained to calculate GDP per capita for the years of the whole period. As we wanted to deduct oil GDP from our estimations because it does not depend on government performance but mostly on the fluctuation of international prices, we also had to deduct GDP from mining production. The reason is that, unlike in the 2003–2015 series, the 1999–2006 data do not differentiate between oil and mining GDP.

For electoral results, the State Electoral Institute of each state (Instituto Estatal Electoral or IEE) was consulted, since a consolidated information source does not exist.¹⁹ The incumbent

¹⁶Previous studies for Mexico at the state level have not adjusted for electoral spending in their estimations. Consequently, it may be that their results are just identifying the increase in electoral spending, rather than a political budget cycle. On average, the electoral budget represents 0.4% of total spending the year before the elections and 0.7% the year of elections.

¹⁷All quantities were measured in thousands of constant 2011 Mexican pesos.

¹⁸GDP was adjusted for inflation using the same 2011-peso base as the state expenditures.

¹⁹In Mexico, the National Electoral Institute (INE) gives autonomy to each state to carry out its own elections. INE is responsible only for national elections.

Table 3. Incumbent Party per State Election. Source: Own elaboration with information from State Electoral Institutes (States' IEE). Note: Extraordinary elections – those held before the standard six-year governor tenure or that were invalidated and held again – are indicated with an asterisk (*).

Incumbent Party	State Elections
PAN	Aguascalientes, 2004; Aguascalientes, 2010; Baja California, 2001; Baja California, 2007; Baja California, 2013; Chiapas, 2006; Guanajuato, 2000; Guanajuato, 2006; Guanajuato, 2012; Jalisco, 2000; Jalisco, 2006; Jalisco, 2012; Morelos, 2006; Morelos, 2012; Nayarit, 2005; Nuevo León, 2003; Querétaro, 2003; Querétaro, 2009; San Luis Potosí, 2009; Sonora, 2015; Tlaxcala, 2010; Yucatán, 2007;
PRD	Baja California Sur, 2005; Baja California Sur, 2011; Mexico City, 2000; Mexico City, 2006; Mexico City, 2012; Chiapas, 2012; Guerrero, 2011; Guerrero, 2015*; Michoacán, 2007; Michoacán, 2011; Tlaxcala, 2004; Zacatecas, 2004; Zacatecas, 2010;
PRI	Baja California Sur, 1999; Campeche, 2003; Campeche, 2009; Campeche, 2015; Chiapas, 2000; Chihuahua, 2004; Chihuahua, 2010; Coahuila, 1999; Coahuila, 2005; Coahuila, 2011; Colima, 2003; Colima, 2009; Colima, 2015; Durango, 2004; Durango, 2010; Guerrero, 1999; Guerrero, 2005; Hidalgo, 1999; Hidalgo, 2005; Hidalgo, 2010*; Michoacán, 2001; Morelos, 2000; México, State of, 1999; México, State of, 2005; México, State of, 2011; Nayarit, 1999; Nayarit, 2011; Nuevo León, 2009; Nuevo León, 2015; Oaxaca, 2004; Oaxaca, 2010; Puebla, 2004; Puebla, 2010; Querétaro, 2015; Quintana Roo, 1999; Quintana Roo, 2005; Quintana Roo, 2010*; San Luis Potosí, 2003; San Luis Potosí, 2015; Sinaloa, 2004; Sinaloa, 2010; Sonora, 2003; Sonora, 2009; Tabasco, 2000; Tabasco, 2001*; Tabasco, 2006; Tabasco, 2012; Tamaulipas, 2004; Tamaulipas, 2010; Veracruz, 2004; Veracruz, 2010; Yucatán, 2001; Yucatán, 2012;

party's vote share is the fraction of valid votes in favor of the state ruling party. Additionally, we used dummy variables for each party to control for electorate party preferences. The PRI dummy variable is equal to 1 if the incumbent party during state elections is the PRI, and 0 otherwise. The PRD and PAN dummy variables were calculated similarly. To control for extraordinary elections as described earlier, we defined a dummy variable called “extraordinary,” which is equal to 1 if elections are so, and 0 otherwise.

Finally, for the information on the local media market, on the number of local TV companies per state, as well as for their broadcast power, we consulted the public database of the Federal Institute of Telecommunications (IFT). In addition, we constructed a Herfindahl Index using the TV companies' broadcast power, assuming the greater the power, the greater the range of coverage, and thus more potential audience and higher ratings.

4. Econometric model

Previous studies mainly use two methods for their estimations: (1) OLS, taking an incumbent's vote share as the dependent variable and (2) probit/logit models, using a reelected/not-reelected dummy as the dependent variable. Unfortunately, OLS does not provide good estimators when the explained variable is bounded between zero and one because the effects of any explanatory variable cannot be constant throughout the entire range (unless the range of the explanatory variable is very limited or zero). Furthermore, the predicted values are not certain to fall in the interval [0, 1]. According to Papke and Wooldridge (1996), the problem is analogous to binary data. Although OLS provides a good guide to identify significantly statistical variables, and it can be used as an exploratory analysis, it is preferable to use other methods (Cameron & Trivedi, 2005).

Papke and Wooldridge (2008) and Wooldridge (2010) propose what they call the *fractional probit model* for panel data. These models have been widely used to analyze all

Table 4. Description of Variables. Source: Own elaboration with information from Mexico’s National Institute of Geography and Statistics (INEGI), State Electoral Institutes (States’ IEE), National Council of Population (CONAPO), and Federal Institute of Telecommunications (IFT).

Variable	Description	Unit of Measure	Source
Incumbent Vote Share _{it}	Fraction of valid votes in favor of the state’s ruling party.	Percentage	States’ IEE
Internet User _{it}	Fraction of state population that has used internet inside or outside the house in the last 12 months.	Percentage	INEGI
Education _{it}	Fraction of state population that has at least a bachelor’s degree.	Percentage	INEGI
PRI _{it}	Equals 1 if the incumbent party during state elections is the PRI, and 0 otherwise.	Dummy	States’ IEE
PRD _{it}	Equals 1 if the incumbent party during state elections is the PRD, and 0 otherwise.	Dummy	States’ IEE
Extraordinary Election _{it}	Equals 1 if the election is extraordinary, and 0 otherwise.	Dummy	States’ IEE
GDP pC _{it-1}	State GDP per capita of the year before elections. Oil and mining production was deducted from state GDP before dividing by population.	Ratio	INEGI,
CONEVAL Expenditure _{it-1}	State expenditure growth rate of the year before elections. It was estimated with the residual of the total annual expenditures minus the electoral spending.	Percentage	INEGI
Time _{it}	Ordinary time, starting at 1 for the first election of every state and increasing one unit per election.	Integer	
LTV _i	Local TV Co.: Number of local TV companies per state. Tlaxcala is the only missing value.	Integer	IFT
HHI-TV _i	Herfindahl index of Local TV’s broadcast power measured in kilowatts, divided by 1000.	Ratio	IFT
Alignment _{it}	Political Alignment: Equals 1 if the state incumbent party is the same as the presidential party during state elections, and 0 otherwise.	Dummy	States’ IEE/INE

kinds of ratios and proportions in the economic literature. Nevertheless, only a few, to the best of our knowledge, have studied vote shares (including, but not limited to: Gardeazabal, 2010; Gonçalves Veiga, 2013; Mason, Jayne, & van de Walle, 2013; Iyer & Shrivastava, 2015). Compared with the logit/probit model, the *fractional probit* provides more insight to the analysis, especially when there are few observations, as there is more variance between the different vote shares compared with the reelected/not reelected dummy variable.

The fractional probit model has the form:

$$E(y_{it}|x_{it}, c_i) = \Phi(x_{it}\beta + c_i) \tag{1}$$

where “i” refers to the state and “t” to the year of elections. The dependent variable, y_{it} , $0 \leq y_{it} \leq 1$, stands for the incumbent party’s vote share. $\Phi(\cdot)$ is the standard normal cumulative distribution function. The explanatory and control variables are indicated as x_{it} . Lastly, c_i is the state-unobserved fixed effect²⁰ and its distribution is assumed to be:

$$c_i|x_{it} \sim \text{Normal}(\psi + \underline{x}_i\xi, \sigma_a^2), \text{ where } \underline{x}_i \equiv T^{-1} \sum_{t=1}^T x_{it}.$$

Under certain assumptions,²¹ Equation (1) can be rewritten as follows:

²⁰Following Papke and Wooldridge (2008) our model allows for time-constant unobserved state effects, which is analogous to a state fixed effect linear regression.

²¹For a full description of the model, see Papke and Wooldridge (2008).

$$E(y_{it}|x_{it}, a_i) = \Phi[(\psi + x_{it}\beta + \underline{x}_i\xi)/(1 + \sigma_a^2)^{1/2}] \tag{2}$$

The pooled Bernoulli quasi-MLE (QMLE) estimator, which is consistent and, under no serial correlation, efficient is used for estimations.²² The QMLE estimator is obtained by maximizing the pooled probit log-likelihood. Because we have unbalanced data, we also allow for different intercepts for each different quantity of observations per state, following Wooldridge, 2010, 2013.²³

Among the explanatory variables, the information variables used in our estimations are internet users and education, as described in Section III. To test the political budget cycle assumption of whether an opportunistic manipulation of fiscal policies before elections helps an incumbent party increase its vote share, we use the state expenditure growth, as described previously. To control for incumbent competence, we assume voters observe economic performance; hence state GDP per capita is included in estimations. Other control variables included are party dummy variables, to control for party loyalties or ideological affiliation, and a dummy variable for extraordinary elections.

In a second set of estimations, we include the number of TV companies per state (LTVC) and the TV companies’ broadcast power industry concentration index (HHI-TV) as a proxy of audience market share, to test whether the conditions of the TV market at the state level has any effect on voters. To control for any potential advantages of political alignment between the state and federal incumbent, we also include a dummy variable identified as “alignment” that is equal to 1 if the political party at the state level is the same as the president’s party during state elections, and 0 otherwise.

Analogous to Equation (3), this second set of estimations follows the pattern:

$$E(y_{it}) = \Phi[\psi + \text{prd}_{it}\beta_1 + \text{pri}_{it}\beta_2 + x_{it}\beta_3 + x_{it}*\text{pri}_{it}\beta_4 + z_{it}y] \tag{3}$$

where prd_{it} and pri_{it} are party dummy variables, x_{it} is the TV market or political alignment variable, and z_{it} stands for other explanatory variables as described earlier. Notice that we allow for an interaction term between pri_{it} and x_{it} .²⁴

Lastly, it may be argued that internet variables will probably capture a democratic tendency in the country that could be explained by other factors such as the strengthening of its institutions, the maturity of the electoral process, the increased experience of voters, or others. It also may be argued that our internet variable could somehow capture the effects of education because internet users usually have more years of schooling. These two variables, time and education, are highly correlated with internet variables. Therefore, we use the following procedure, inspired by the Hausman test for endogeneity (Wooldridge, 2002). First, the following auxiliary equations are estimated by ordinary least squares (OLS) with state-fixed effects:

²²In our estimations, t-1 refers to the year before the election. See Table 3 for detailed descriptions of elections years and years before election.

²³Data include two elections for 10 states (23% of all observations), three elections for 20 (68%), and four for just two states (9%). Therefore, we allow for two intercepts using states with two elections as a base for comparison.

²⁴An exploratory analysis showed no difference in the TV companies’ slope for the PAN and the PRD. The same is true for the slopes of the HHI-TV and interactions between intercepts of political alignment and political parties. Therefore, equations were designed to allow for different intercepts for each party and a different slope for PRI, but to restrict PAN and PRD to have the same slope. See Table A1 in the Appendix for a guide to interpreting interactions per political party.

$$\text{internet users}_{it} = \beta_0 + \beta_1 \text{education}_{it} + \beta_2 \text{time}_t + f_i + \varepsilon_{it} \quad (4)$$

$$\text{internet users}_{it} = \beta_0 + \beta_1 \text{education}_{it} + \beta_2 \text{time}_t + \beta_3 \text{time}_t^2 + f_i + \gamma_{it} \quad (5)$$

$$\text{internet users}_{it} = \beta_0 + \beta_1 \text{education}_{it} + \beta_2 \text{time}_t + \beta_3 \text{time}_t^2 + \beta_4 \text{time}_t^3 + f_i + \omega_{it} \quad (6)$$

where the variables *internet users*, *education*, and *time* are the same as defined previously (Table 2). State fixed effects²⁵ are indicated as f_i . Squared and cubic time variables are included in Equations (4) and (5) respectively, to identify quadratic or cubic tendencies because internet growth might display an exponential growth, and then, as it increases past a certain point, it should diminish.

Second, the estimated error residuals ($\hat{\varepsilon}_{it}$, $\hat{\gamma}_{it}$, $\hat{\omega}_{it}$) of the auxiliary regressions are included in similar models as Equation (2). Intuitively, the residuals are everything else that explains internet users' growth that is not attributable to time or education. The resulting correlation of the estimated residuals with time and education is very low by construction. Therefore, time and education can now be included in the estimations, avoiding multicollinearity, by replacing the internet variable with $\hat{\varepsilon}_{it}$, $\hat{\gamma}_{it}$, or $\hat{\omega}_{it}$. If the estimated residuals in the second model are significant, we could interpret this as the effect of the share of voters with access to the internet on incumbent's votes that is not due to time or education.

5. Results

Table 5 displays the coefficient estimates and the average marginal effects of our variables of interest, along with the control variables (see also Figure 2). First, the variable "internet users" results are significant and negative. The coefficient indicates that the incumbent party's vote share decreases as the population with access to the internet increases; assuming a constant rate,²⁶ the vote share would drop between 2.1 and 2.3 percentage points if internet access increased by 10 percentage points. For instance, in Nuevo León, internet users grew 45 percentage points between 2009 and 2015 elections. This implies a reduction of approximately 9.5 to 10.4 percentage points for the incumbent's vote share due to internet user access, assuming a constant effect.

Second, the annual state expenditure growth in the year before elections is significant and positive, as expected, for all estimations. This result implies that the incumbent party's vote share increases as the state spending growth expands such that, if the rate were constant,²⁷ the vote share would increase between 2.2 and 2.7 percentage points if the expenditure growth increased by 10 percentage points. Contrary to what Amarillas and Gámez (2014) conclude, opportunism seems to pay off in Mexico, however its effectiveness depends on other factors, such as the market conditions of news supply, as we will see.

It is worth mentioning that during an exploratory analysis the expenditure growth during an election year turned out not to be statistically significant. The reason could be that most state elections in our sample were held in mid-year, only a few elections were held during the

²⁵The Hausman test favored fixed effects over random effects.

²⁶See StataCorp (2011), for details on interpretation.

²⁷Ibid.

Table 5. Coefficient Estimates and Average Marginal Effects of Explanatory Variables on Incumbent Party’s Vote Share Note: Table displays coefficient estimates (CE) and average marginal effects (AME) of explanatory variables on incumbent party’s vote share, using a fractional probit model with state fixed effects following Equation (2). Incumbent’s vote share is the fraction of valid votes in favor of the state ruling party. Explanatory variables are described in Table 4. State average of explanatory variables, extraordinary election dummy, and intercepts for each different quantity of elections per state are not shown. Standard errors are displayed in parentheses. Significance levels are indicated at 90% (*), 95% (**), and 99% (***).

	(1)		(2)		(3)	
	CE	AME	CE	AME	CE	AME
Internet Users _{it}	-0.532** (0.243)	-0.208** (0.094)			-0.580** (0.251)	-0.226** (0.097)
Expenditure _{it-1}			0.688*** (0.258)	0.268*** (0.100)	0.574*** (0.205)	0.224*** (0.079)
GDP pc _{it-1}	4.014* (2.074)	1.567* (0.808)	0.754 (1.599)	0.294 (0.624)	3.916** (1.959)	1.525** (0.761)
Education _{it}					1.106 (1.095)	0.431 (0.425)
PRD _{it}	-0.125 (0.108)	-0.047 (0.041)	-0.074 (0.096)	-0.028 (0.037)	-0.080 (0.115)	-0.030 (0.044)
PRI _{it}	0.163 (0.101)	0.064 (0.039)	0.146 (0.107)	0.057 (0.041)	0.154 (0.109)	0.060 (0.042)
Constant	-0.310* (0.167)		-0.471*** (0.148)		-0.540** (0.243)	
Obs.	88		88		88	
Wald test	37.02		40.49		52.85	
p-value	0.00		0.00		0.00	
Mc Fadden Pseudo R ²	0.013		0.014		0.016	

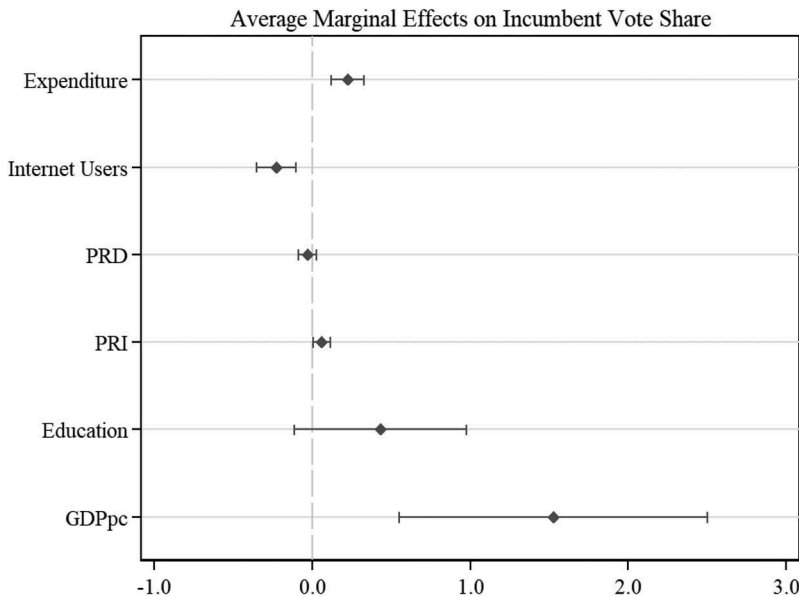


Figure 2. Average Marginal Effects of Explanatory Variables on Incumbent Party’s Vote Share. Source: Own elaboration. Note: Figure displays average marginal effects (AME) of explanatory variables on incumbent party’s vote share, using a fractional probit model with state fixed effects following Equation (3) of Table 5. Caps represent confidence intervals at 80%.

first quarter of the year, and, unfortunately, available data at the state level are annually aggregated. Therefore, pre-electoral expansions during the election year might be cancelled out by post-election contractions. These results would be aligned with the findings of Streb, Lema, and Garofalo (2012) at the national level in Latin American countries. In Mexico, the state expenditure growth of the year before elections is on average almost the double of the year of elections, if electoral spending is deducted from the total. Previous studies on Mexico have focused on spending during election years, and although some have included the pre-election year as a control variable, the results are not conclusive. For example, contrary to Ramirez and Erquizio (2012), Gámez and Ibarra-Yúnez (2009) find evidence of opportunism in the pre-election year at the state level but only for subsidies and “other” expenses, not for total expenses. However, neither study excludes electoral spending from the estimations. Therefore, the evidence found in this study would suggest a redirection of the analysis toward the year before elections at least in aggregated annual data.

Regarding the economic performance control variable, we find some evidence that GDP per capita of the year before elections is positive, and significant for some estimations. This makes sense, as it is expected that voters reward incumbents if they interpret economic growth as part of an incumbent’s performance. The values of the year before elections are used in estimations to control for economic performance of the same year that voters observe the expenditure variable.

Lastly, the results from the education and party dummies are not significant. In contrast, the constant, which could be interpreted as PAN incumbents because it is the base party category, is significant and negative.

So, why is growing internet access bad news for incumbents? Following Besley and Prat (2006) and Miner (2015), in countries where media markets are highly concentrated, governments are likely to capture news providers; therefore, the news supply might be biased in favor of incumbents, with the media reporting mostly good things about incumbents and omitting any negative reports. According to Besley and Prat (2006), government media capture (1) increases the probability of politicians taking part in rent-seeking activities because they know they are less likely to get caught and (2) reduces the probability of identifying and replacing bad politicians. In the context of political budget cycles, media capture would hinder voters from identifying opportunistic spending as such and thus reduce the probability of replacing bad incumbents. In these environments, the internet could provide new negative information about incumbents, pushing voters to the opposition, as the internet is more expensive and difficult to capture because of its nature and economic impact.

6. Robust analysis

6.1. Local TV market and political alignment

Now, what evidence do we have for the local media market conditions? Our data shows that there is an influence of media bias in favor of incumbents, but the effects differ by party. More importantly, as we would expect if media freedom increased, we observe that the pending effect decreases as the number of local TV companies increases. This result supports our argument regarding the high risk of mainstream media capture by the government due to the low number of local TV companies; as their number increases,

the probability of being manipulated by the state decreases. Table 6 shows the coefficient estimates and average marginal effects of the Equation (3).

First, by analyzing the number of local TV companies, we find differentiated effects by the party. There seems to be evidence of bias in favor of the PRI and against the PAN and PRD. The results of the Equation (1) in Table 6 imply that there is a positive quadratic effect of the number of local TV companies in the state in favor of the PRI, but not for its opposition, PAN and PRD.

More interestingly, our model allows us to observe a decrease in the magnitude of the effect of the state expenditure growth as the number of local TV companies

Table 6. Coefficient Estimates and Average Partial Effects of Explanatory Variables on Incumbent Party’s Vote Share: Local TV Market Conditions and Political Alignment. Note: Table displays coefficient estimates (CE) and average marginal effects (AME) of explanatory variables on incumbent party’s vote share, using a fractional probit model with state fixed effects following Equation (3). Incumbent’s vote share is the fraction of valid votes in favor of the state ruling party. Explanatory variables are described in Table 4. State average of explanatory variables, extraordinary election dummy, and intercepts for each different quantity of elections per state are not shown to conserve space. For detailed effects of interactions and political party see Table A1 in the appendix. Standard errors are displayed in parentheses. Significance levels are indicated at 90% (*), 95% (**), and 99%.

	(1)		(2)		(3)	
	CE	AME	CE	AME	CE	AME
Internet Users _{it}	-0.579** (0.252)	-0.225** (0.097)	-0.597** (0.252)	-0.232** (0.097)	-0.632** (0.290)	-0.245** (0.111)
Expenditure _{it-1}	0.640*** (0.193)	0.249*** (0.075)	0.662*** (0.223)	0.257*** (0.086)	0.628*** (0.208)	0.244*** (0.081)
GDP pc _{it-1}	4.246** (2.010)	1.649** (0.776)	4.064** (1.986)	1.581** (0.771)	4.384* (2.521)	1.703* (0.974)
Education _{it}	0.995 (1.059)	0.387 (0.411)	1.059 (1.029)	0.412 (0.399)	1.064 (1.047)	0.413 (0.405)
LTVC _i	-0.004 (0.239)	-0.012 (0.017)				
LTVC _i ²	0.011 (0.026)					
PRI _{it} *LTVC _i	-1.201*** (0.392)					
PRI _{it} *LTVC _i ²	0.203*** (0.063)					
HHI-TV _i			-0.076** (0.036)	-0.013 (0.011)		
PRI _{it} *HHI-TV _i			0.069* (0.041)			
Alignment _{it}					-0.336*** (0.108)	-0.073*** (0.020)
PRI _{it} *Alignment _{it}					0.240 (0.148)	
PRI _{it}	1.807*** (0.644)	0.097** (0.043)	-0.245 (0.210)	0.062 (0.044)	-0.089 (0.109)	0.000 (0.036)
PRD _{it}	-0.040 (0.130)	-0.016 (0.050)	-0.063 (0.122)	-0.024 (0.047)	-0.355*** (0.122)	-0.134*** (0.044)
Constant	-0.358 (0.625)		-0.038 (0.300)		-0.244 (0.218)	
Obs.	86		86		88	
Wald test	168.09		56.58		75.13	
p-value	0.00		0.00		0.00	
McFadden Pseudo-R ²	0.042		0.040		0.020	

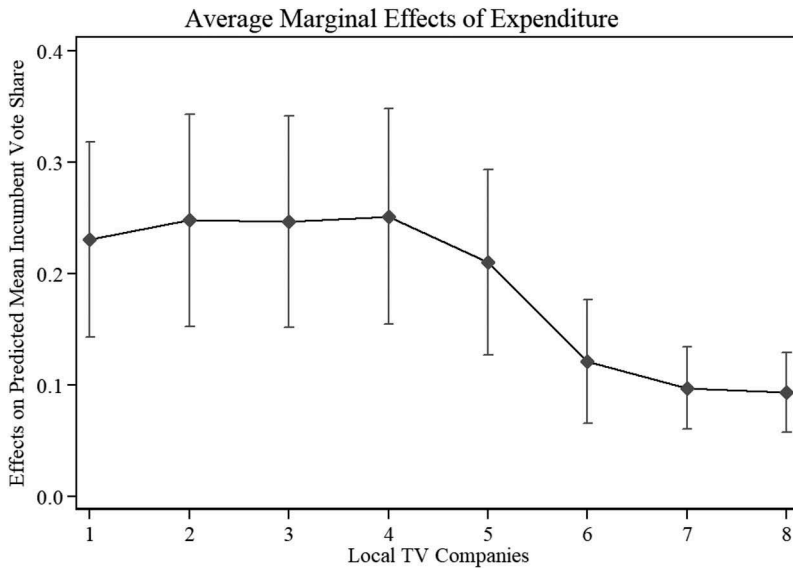


Figure 3. Spending and Local Mainstream Media. Source: Own elaboration. Note: Caps represent confidence intervals at 80%.

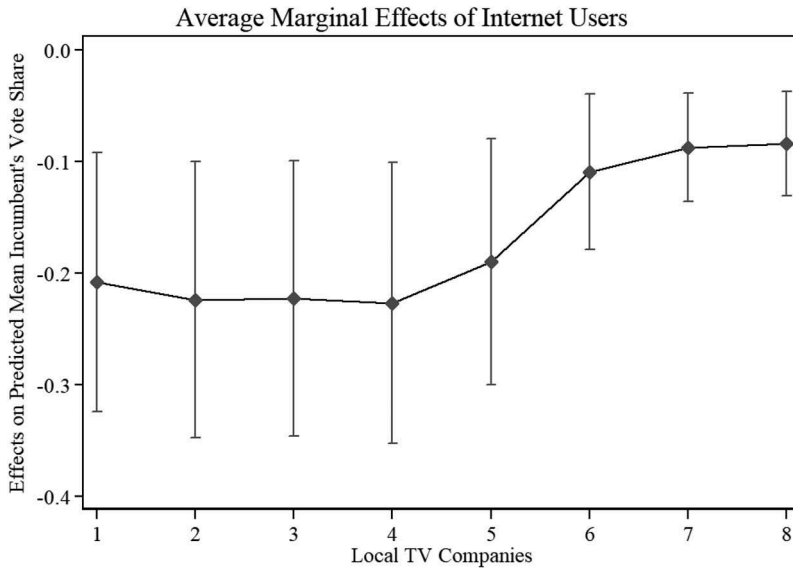


Figure 4. Internet Users and Local Mainstream Media. Source: Own elaboration. Note: Caps represent confidence intervals at 80%.

increases (Figure 3).²⁸ Not surprisingly, the same seems to be true for the internet access, as the effect is expected to be stronger with a lower number of broadcast

²⁸We also find that the spending effect decreases as the access to internet increases, however, the differences are not statistically significant.

media (Figure 4). This evidence favors our argument of the risk of media capture by the government due to the small number of local TV companies. On one hand, under media capture, the news suppliers would be biased in favor of the incumbents. Consequently, the voters could not identify the opportunistic spending as such, and thus end up rewarding the state expenditure growth. As more companies enter the market, it becomes more expensive for the government to capture the media and the effect of spending drops. On the other hand, the negative information that internet media provides is relevant as long as the traditional media freedom is restricted. Under a market with a low probability of media capture, the mainstream media would also provide negative information about the incumbents, shrinking the negative effect of internet on the governor’s party votes. In other words, the media market conditions matter for whether opportunistic policy manipulations pay off for incumbents.

Second, we also find different effects by party for the TV concentration index (HHI-TV). Equation (2) of Table 6 shows that there is almost no effect for the PRI incumbents as the index grows. On the contrary, the PAN and PRD are negatively affected. This result would suggest a bias against these two political parties.

Third, we explore the political alignment between the state incumbent party and the presidential party, as it might be interesting for several reasons. For example, voters might perceive state elections as secondary and could form their opinions based on government performance at the federal level, or in states ruled by the opposition party, more-diverse information could exist already. Going back to Table 6, the results show that there is a negative effect for the PAN when it is aligned with the presidential party, while there is no significant effect for the PRI. (There has never been a PRD president and thus no possible alignment.)

Table 7. Auxiliary OLS Fixed Effects Regressions to Control for Time and Education Effects. Note: Regression results of Equations (3), (4) and (5), using OLS with state fixed effects and robust standard errors. Explained variable is Internet Users, which is measured as the fraction of state population that accessed the internet in the past 12 months during the year of elections. Time is ordinary time, starting at 1 for the first election of every state and increasing one unit per election per state. Education is measured as the fraction of state population that has at least a bachelor’s degree during the year of elections (t). Standard errors are shown in parentheses. Significance levels are indicated at 90% (*), 95% (**), and 99% (***).

	Internet Users		
	(1)	(2)	(3)
Education _{it}	1.534*** (0.251)	1.565*** (0.276)	1.433*** (0.259)
Time _{it}	0.132*** (0.010)	0.079*** (0.028)	-0.153 (0.139)
Time _{it} ²		0.013* (0.007)	0.127* (0.070)
Time _{it} ³			-0.017 (0.010)
Obs.	88	88	88
Adj. R ²	0.87	0.87	0.87
F statistic	119.11	78.58	80.08
p value	0.000	0.000	0.000

Table 8. Descriptive Statistics of Estimated Residuals of Auxiliary OLS Regressions. Note: Summary statistics of estimated residuals $\hat{\epsilon}_{it}$ and of Equations (1), (2) and (3) of Table 7, respectively.

	Obs.	Missing	Mean	Min.	Max.	Std. Dev.
$\hat{\epsilon}_{it}$	88	0	0	-0.1085	0.1802	0.0487
\hat{Y}_{it}	88	0	0	-0.1029	0.1768	0.0480
$\hat{\omega}_{it}$	88	0	0	-0.0991	0.1691	0.0472

Table 9. Coefficient Estimates and Average Marginal Effects of Internet Users' ($\hat{\epsilon}_{it}$, \hat{Y}_{it} , $\hat{\omega}_{it}$) Robust Estimations on Incumbent Vote Share. Note: Coefficient estimates (CE) and average marginal effects (AME) of time-and-education robust estimations on incumbent party's vote share using a fractional probit model with state fixed effects. Incumbent party's vote share is the fraction of valid votes in favor of the state ruling party. Internet Users ($\hat{\epsilon}_{it}$), (\hat{Y}_{it}), and ($\hat{\omega}_{it}$) variables are the estimated residuals of Equations (1), (2) and (3) of Table 7. All other explanatory variables used are described in Table 4. State average of explanatory variables, extraordinary election dummy, and intercepts for each different quantity of observations per state are not displayed. Standard errors are shown in parentheses. Significance levels are indicated at 90% (*), 95% (**), and 99% (***).

	(1)		(2)		(3)	
	CE	AME	CE	AME	CE	AME
Internet Users ($\hat{\epsilon}_{it}$)	-1.277*** (0.339)	-0.495*** (0.131)				
Internet Users (\hat{Y}_{it})			-1.162*** (0.369)	-0.451*** (0.143)		
Internet Users ($\hat{\omega}_{it}$)					-1.288*** (0.402)	-0.499*** (0.156)
Time _{it}	-0.060 (0.056)	-0.023 (0.022)	-0.068 (0.055)	-0.026 (0.021)	-0.077 (0.055)	-0.030 (0.021)
Education _{it}	-0.117 (0.962)	-0.045 (0.373)	-0.114 (0.931)	-0.044 (0.362)	-0.195 (0.906)	-0.075 (0.351)
Expenditure _{it-1}	0.599*** (0.179)	0.232*** (0.069)	0.587*** (0.189)	0.228*** (0.073)	0.601*** (0.187)	0.233*** (0.073)
GDP pc _{it-1}	3.791 (3.112)	1.470 (1.203)	4.277 (2.940)	1.661 (1.138)	4.840* (2.890)	1.876* (1.115)
PRD _{it}	-0.354*** (0.095)	-0.135*** (0.035)	-0.356*** (0.113)	-0.136*** (0.042)	-0.398*** (0.099)	-0.151*** (0.036)
PRI _{it}	-0.109 (0.087)	-0.043 (0.034)	-0.110 (0.097)	-0.043 (0.038)	-0.165** (0.077)	-0.064** (0.030)
PAN _{it} *Alignment _{it}	-0.369*** (0.094)	-0.139*** (0.033)	-0.336*** (0.095)	-0.128*** (0.034)	-0.423*** (0.101)	-0.159*** (0.035)
Constant	0.146 (0.271)		-0.106 (0.246)		-0.066 (0.245)	
Obs.	88		88		88	
Wald test	107.80		154.33		279.87	
p-value	0.00		0.00		0.00	
McFadden Pseudo-R ²	0.022		0.020		0.023	

Overall, we might conclude that there is evidence of the influence on state elections of the conditions of the local mainstream media market, which supports our argument regarding the relevance of the context. In particular, the opportunistic spending matters as long as the local news market might be captured by the government. As expected, if media freedom strengthens by an increase in the number of participants, the expenditure influence on incumbent votes decreases. The same seems to be true about the internet. Its negative effect on the governor's party votes drops as more local TV companies enter the market. Therefore, it seems that market conditions of news supply such as industry concentration,

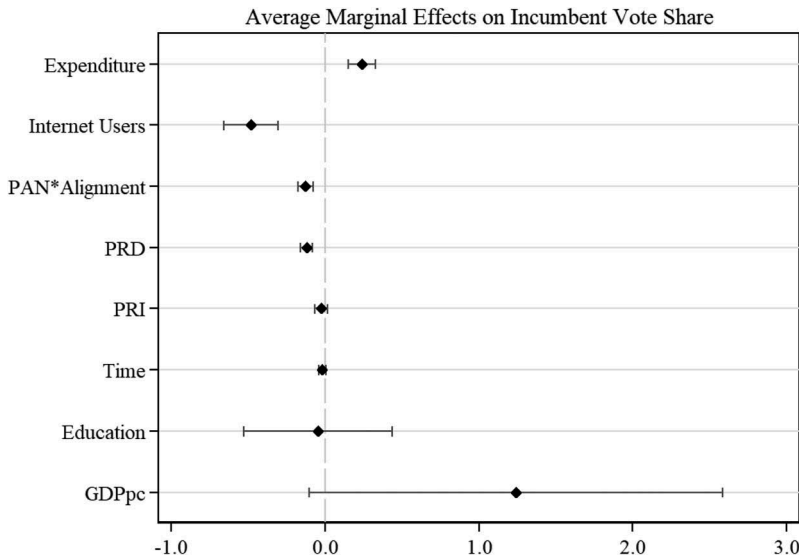


Figure 5. Average Marginal Effects of Explanatory Variables on Incumbent Party's Vote Share. Source: Own elaboration. Note: Figure displays average marginal effects (AME) of explanatory variables on incumbent party's vote share, using a fractional probit model with state fixed effects following Equation (3) of Table 9. Caps represent confidence intervals at 80%.

changes in technology, and media freedom are crucial factors for the effectiveness of opportunistic policy manipulations by incumbents.

6.2. The high correlation of internet with time and education

Lastly, we deal with the high correlation between internet access and time and education. As explained previously, internet growth might be capturing other effects that are correlated with time, such as the strengthening of institutions, electoral experience, or the maturity of democracy. Internet growth might also be capturing the behavior of more-educated people, as they are more likely to use the web.

Table 7 contains the estimations of auxiliary regressions (4), (5), and (6).²⁹ Education results are significant in all cases, whereas for time, even though not all of the time variables had significant results, particularly in column three (3), they were very close. In fact, the adjusted R-squared is not negatively affected when squared and cubic time factors are introduced. Therefore, the results suggest a cubic tendency in internet growth with time – in other words, an exponential growth that slows down after a certain point.

We used the estimated residuals from these auxiliary regressions (it) instead of internet users, and added time and kept education as control variables.³⁰ Table 8 displays the descriptive statistics of estimated residuals, and Table 9 shows the coefficient estimates and average marginal effects. In all cases, we can observe that the effect of internet

²⁹Standard statistical tests revealed heteroscedasticity and no auto-correlation of the first degree. Robust standard errors are used in the estimations.

³⁰For these estimations, we used an analogous model to Equation (3) of Table 6, with the difference that we are restricting only for PAN to have an alignment effect, as there were no significant effects for the PRI.

users doubles, staying significant and negative. As for the time and education variables, they turn out not to be significantly different from zero. Regarding the rest of the variables, the state expenditure growth, PRD and PAN alignment keep their magnitude and significance in all three equations, whereas GDP per capita and PRI are significant only in the third one (Figure 5). Therefore, not only do internet access and state expenditure seem robust, but also the first results might be underestimating the effect of the internet due to the correlation with time and education.

7. Conclusions

This study evaluates the effects of internet access on state election outcomes in Mexico, a consolidating democracy, during 1999–2015. Despite the democratic progress that has been achieved, Mexico is still characterized by weak institutions and limited freedom of traditional media. Among other critical problems like violence against journalists, its broadcast media are considered not free because of high levels of industry concentration. The internet, in contrast, enjoys more freedom and diversity, although access to it has not spread equally throughout the country.

Our results indicate, on the one hand, that an increase in the state's portion of the population with internet access decreases the incumbent party's vote share. On the other, an opportunistic increase in state spending growth during the year before elections increases the incumbent party's vote share. These results coexist and prevail even after controlling for local TV market conditions, political alignment, and correlation with time and education. Furthermore, our model shows that the effects of spending and internet drop as the number of local mainstream media increase. Overall, the evidence would suggest that local market conditions of news supply (e.g., industry concentration, changes in technology, and media freedom) may determine whether incumbents' fiscal policy manipulations pay off.

Intuitively, in environments where there are few participants in the media market, government might capture them. Captured media would be biased in favor of incumbents and, in the context of the PBC, hinder voters to identify opportunistic state spending. Consequently, voters end up rewarding this behavior at ballots. Internet media, on the contrary, would provide negative information about politicians because it enjoys more freedom, reducing the incumbent's votes. Moreover, as more broadcast companies enter the market, the risk of being captured drops because it becomes more expensive for the government, and thus, the spending effect shrinks.

Comparing our results to previous studies, we find that Jones et al. (2012) argue that voters might be fiscal liberals if the fiscal regime allows them to perceive that they can pass the cost of the increased spending to someone else. In that case, media capture would boost the effect of the increased spending because news suppliers would be biased in favor of incumbents. However, the authors support their proposition with evidence from Argentina, where media is also highly concentrated and classified as partially free by Freedom House. Therefore, more research is needed to disentangle the effect of the country's fiscal structure and the media freedom.

On the other hand, if media capture reduces political knowledge and participation as Leeson (2008) argues, both effects would produce similar results to our study, but with different mechanisms. In particular, an increment in media

freedom (e.g., increase in internet media or decrease in media industry concentration) would expand both, political knowledge and participation. If political knowledge increases, voters might start considering other factors more important at ballots, than government spending, such as economic performance or employment. In consequence, the spending effect would also diminish. Conversely, assuming voter preferences are normally distributed, an increased political participation would spread out votes equally between the alternatives, and all, not only incumbents, would see a reduction in the percentage share of their supporters. Although our study controls for voter turnout, as we use effective votes in our analysis, both phenomena might be further studied in detail.

Finally, several paths could be explored in future studies on the effect of internet on elections. First, in the case of Mexico, internet access might hinder incumbents from engaging in opportunistic spending knowing that there would be a higher probability of being caught. The evidence shows that an increase in media freedom decreases the magnitude of the political budget cycle (Ademmer & Dreher, 2015; Akhmedov & Zhuravskaya, 2004). Second, internet access might be generating political polarization by reinforcing preconceived beliefs, as social media and internet browsers tend to favor sites and news that are more likely to be aligned with users' preferences, creating an echo chamber (Sunstein, 2017).

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix

Table A1. Coefficient Guide for Political Party and Interaction Effects of Equation 6 (Table 6). Source: Own elaboration. Note: Equations were designed to allow for different intercepts for each party and different slope for PRI, but to restrict PAN and PRD to have the same slope; an exploratory analysis revealed no differentiated effects between slopes of PAN and PRD. (*) There has not been a PRD president.

		X		
		Continuous	Dichotomic (Alignment)	
Party	Dummy Party	(TV Companies & HHI-TV)	X = 0 (Not Aligned)	X = 1 (Aligned)
PRI	PRI = 1; PRD = 0	$\psi + \beta_2 + \beta_3 + \beta_4$	$\psi + \beta_2$	$\psi + \beta_2 + \beta_3 + \beta_4$
PAN	PRI = 0; PRD = 0	$\psi + \beta_3$	ψ	$\psi + \beta_3$
PRD	PRI = 0; PRD = 1	$\psi + \beta_1 + \beta_3$	$\psi + \beta_1$	*