e-Rational Voters: Measuring the effects of Internet and Media Freedom on the Political Budget Cycles in a Consolidating Democracy.

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ABSTRACT

This paper studies the effects of internet access and media freedom on political outcomes in Mexico during state elections between 1999 and 2015, testing the Political Budget Cycle Theory. Previous studies in Mexico have missed to include the role of voters, as well as performance of incumbents. Evidence suggests that: 1) expansive opportunistic state expenditure during the year before elections increases incumbent’s vote share and his probability to be reelected, and 2) access to freer media information provided by internet reduces incumbent’s vote share and his probability to be reelected. Evidence found help conciliate voter behavior theories: they act as fiscal conservatives if they can have access to plural information. Finally, it contradicts previous studies that conclude that PBC does not pay off in Mexico.

**JEL Codes:** D720, E320, H720

**Key search terms:** Political Budget Cycle, Voter Rationality, Political Economy of Internet, Democracy, Media Freedom, Media Persuasion

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# « Soutenons la liberté de la presse, c'est la base de toutes les autres libertés, c'est par là qu'on s'éclaire mutuellement. Chaque citoyen peut parler par écrit à la nation, et chaque lecteur examine à loisir, et sans passion, ce que ce compatriote lui dit par la voie de la presse. »

# Voltaire, *Questions sur les miracles*

# “No había vergüenza ni negación: Televisa y el Partido eran uno solo.”

Fabrizio Mejía Madrid, *Nación TV*

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# INTRODUCTION

From an economic perspective, it may be argued that democracy and the political institutions determine and influence the nation’s success or failure (Barro, 1996; Przeworski et al., 1999; Acemoglu & Robison, 2006 & 2012). In established democracies, elections are commonly thought to provide accountability. They incentivize political competition, and thus, governments to be more efficient by a) weeping out incompetent politicians (Barro, 1973; Ferejohn, 1986) and b) by giving governors motives to strive to rule proficiently (Rogoff, 1990). However, electoral pressures may also generate incentives for incumbents to manipulate public policy, seeking to increase their chances of reelection, especially in consolidating democracies. These manipulations before elections tend to eventually have negative economic impacts in the short and long term. Political business cycle theory studies these economic distortions stimulated by the periodicity of elections.

In order for elections to provide accountability effectively, citizens need political institutions, “accountability agencies”, to help them monitor politicians (Przeworski et al., 1999). It may be argued that a free media is an effective accountability agency that help citizens in this endeavor (Brunetti & Weder, 2003). With the arrival of internet and social media, and their apparently relation to the recent democratization of certain countries around the world, the interest of their political and economic effects, especially in weak democracies, has been recently increasing. This is the central question of this study.

This paper studies the effect of internet access and media freedom on political outcomes in Mexico during state elections from 1999 to 2015, testing the Political Budget Cycle (PBC) theory, and taking insights from Political Economy of Mass Media, Economic Voting and Political Science. We argue that in consolidating democracies (weak institutions, limited fiscal transparency and/or weak system of checks and balances) with restricted media freedom (e.g. media captured by government), internet provides voters access to plural media information. Better informed voters behave like fiscal conservatives (Miner, 2015; Ademmer & Dreher, 2015), punishing incumbents rather than rewarding them, if they incur in opportunistic activities. In other words, the ability of voters to monitor incumbents and punish opportunistic behavior depends on their access to free and plural media (Eslava, 2011). The absence of media pluralism, or the presence of biased media, account for voters to infer poorly incumbent’s competence and reward them for incurring in opportunistic policy manipulation, increasing their chances to be reelected (Besley & Prat, 2006).

Evidence suggests that 1) expansive expenditure increases incumbent’s party vote share, increasing probability of reelection and that 2) in the presence of traditional broadcast media capture, internet access allows voters to identify better incumbent’s competence and penalize opportunistic behavior, reducing incumbents’ party vote share and his/her chances to be reelected. Evidence helps to conciliate two strands of literature regarding voter behavior: voters behave like fiscal conservatives depending on their access to information. They also contradict previous studies that argue that PBC does not help incumbents get their parties reelected in Mexico.

In Section 1.2, I discuss briefly about the events that raised our curiosity about the political economy of internet. Section 1.3 explains why Mexico is a good laboratory for testing the effects of internet in a consolidating democracy with media capture. Political Budget Cycle theory, and main conclusions from Political Economy of Mass Media and Economic Voting used to enhance study are reviewed in Section 2. Econometric model and data are explained in Section 3 and 4. I discuss results and their limitations in Section 5. Finally, in Section 6, conclusions and implications are explored.

1.2. TWO SPRINGS, ONE PHENOMENON

Can internet help democratize a country? What role does the media freedom play? Is it trivial the reason why social media is freer than traditional media? Several international and regional events point the relevance of the web and social networks in democratic processes. For example, we can list and consider at least three: The Arab Spring, Mexico’s #YoSoy132 student movement and Mexico’s 2015 state elections.

First, during the Arab Spring that started in 2010, social networks were used to coordinate civil mass mobilizations against repressive dictatorships. Access to internet and social media were banned along with mobile phones in Egypt and Tunisia by governments to hinder civic coordination. According to a poll from March 2011[[3]](#footnote-3), almost all Egyptians and Tunisians (9 out of 10) used Facebook to coordinate and promote civil protests. The majority informed themselves by consulting social media sites (88% of Egyptians and 94% of Tunisians) and over a quart (28% and 29%, respectively) considered that blocking Facebook greatly impeded their coordinated actions[[4]](#footnote-4). During those days, after internet was banned, Google and Twitter developed a special service that enabled Egyptians to make their voices be heard world-wide[[5]](#footnote-5). It is still being discussed if social media was the main catalyst for this democratic awakening, but it is generally agreed that it was of paramount importance.

Second, during Mexico’s 2012 presidential elections, a democratic student movement, who later became known as #YoSoy132, denounced mass media control by the state and a biased coverage in favor of the presidential candidate of the Partido Revolucionario Institucional (PRI), who ruled Mexico for more than 70 years in the past. Movement originated after a video response to contradict broadcast and printed media went viral in social networks. Some considered this movement as the beginning of the Mexican Spring[[6]](#footnote-6).

Finally, during 2015 elections, for the very first time in Mexico’s political & democratic history, independent candidates were voted for and resulted elected for state governors, mayors and congressmen[[7]](#footnote-7). Their primary strategy for their campaign and to convince people to vote for them was the leverage of social media. Despite all the disadvantages (e.g. onerous law requirements, funding, and TV/radio spots), six candidates resulted elected. The most notorious win was for Jaime Rodriguez Calderon, better known as ‘El Bronco’ (the wild stallion), who became state governor of Nuevo León, an important industrial hub and second richest state in the north of Mexico.

This study explores and attempts to measure the effects of internet in the events described for Mexico, but we could proceed from here to generalize and understand similar phenomena.

1.3 MEXICO’S DEMOCRACY, MEDIA FREEDOM AND INTERNET ACCESS

Democratic conditions, state internet access heterogeneity and restricted media freedom make Mexico a good natural laboratory to explore our question of interest. On one hand, in the presence of high industry concentrations, media are more likely to be captured by government. Furthermore, media has been found to have large persuasion effects in consolidating democracies. On the other hand, internet prevails freer than traditional media. These factors and the high diversity of internet access between the states facilitates the study.

Although democratic progress has been achieved, Mexico is described as a flawed[[8]](#footnote-8), relatively young[[9]](#footnote-9) and partly free[[10]](#footnote-10) democracy. International organizations highlight the overshadow of the legislative and judiciary powers by the presidential power, the lack of a fully regulated system of political competition, the politically motivated violence that plagues the country, a weak rule of law and the corruption as the main challenges still to overcome.

Mexico has experienced, like other countries in the world, a slow but constant growth in internet household penetration and usage due to the strong impulse of mobile telephones and the decrease of prices (see Fig. 1). However, in 2011 Mexico was still behind compared to other OECD countries (see Fig. 2). Nevertheless, internet access has not spread through the country equally for all. There exists a high diversity between the states (see Fig. 3 and Fig. 4). Mexico City, Nuevo Leon, and Baja California Sur have much higher penetration rates than Chiapas, Oaxaca and Tabasco (see Fig. 5).

It is not only important for countries to have access to internet, but also a strong media freedom. The sole access to internet is irrelevant if people can’t get well informed by media that is objective and enjoys freedom to exercise its watchdog function. In Mexico, violence against independent media, journalists’ assassinations[[11]](#footnote-11), government censorship, and high concentration levels of broadcast media compromise media freedom[[12]](#footnote-12). Nonetheless, internet has enjoyed more freedom than traditional media. Freedom House (FH)[[13]](#footnote-13), an international independent watchdog organization, ranked Mexico’s freedom of the press as “not free” in 2015 (see Fig. 1-5), but on the contrary, Mexico’s net freedom was classified as “partially free”.

A major threat to the broadcast media freedom is the elevated industry concentration rate. The principal source of information for most of the country is the oligopolistic broadcast media. The two major networks, Televisa and TV Azteca, control most of the television market. Also, the concentration of official advertising is elevated. They both together get 25 percent of the total sum of federal resources allocated for official advertising, estimated at about $400 million dollars according to FH. The discriminatory use of public advertising funds has been considered by international organizations as “subtle censorship”.

So, these three factors ––weak democracy, high internet heterogeneity and traditional broadcast media capture–– are an important background for our study and at the same time qualify Mexico to be a good laboratory (sadly) for testing our hypothesis.

# THE POLITICAL BUDGET CYCLE, ECONOMIC VOTING AND ECONOMICS OF MASS MEDIA.

Although this study focus on the Political Budget Cycle and political economy of internet, it is also interrelated to other currents of literature in economics and Political Science such as Political Economy of Mass Media, Economic Voting, Public Choice, and Political Accountability.

* 1. THE POLITICAL BUDGET CYCLE

As explained before, Political Business Cycle theory emphasizes the distortions stimulated in the economy by the periodicity of elections. Theory explains that incumbent governors have incentives to remain in power. They engage in opportunistic manipulation of public policies to persuade voters to keep them in power (Nordhaus, 1975).

Currently, there is a debate on how to explain from an economic perspective the incentives and rationale of the voters. Traditional models suppose voters have adaptive expectations which are independent of incumbent’s ideology, and are short-sighted and naive (Nordhaus, 1975). In these models voters do not learn from the past, and they have forgotten the previous post-electoral recession by the time the following election approaches. These assumptions (naïve voters who are incapable of learning and predisposed to regular mistakes in expectations) are quite unsatisfactory from a conceptual point of view (Alesina, 1997).

On the contrary, rational models assume rational expectations, supposing asymmetric information about the incumbent’s performance between voters and politicians (Rogoff and Sibert, 1988; Rogoff, 1990; Persson and Tabellini, 1990). Rational models assume that politicians are better informed about their own competence than citizens. Incumbents take advantage of this information asymmetry and try to signal as much capability as possible, leading to political business cycle. Competence is revealed to voters after elections. Intuitively, in rational models, if incumbent’s competence is observed no political cycle is produced.

However, in this signaling game the most competent incumbents generate the sharpest business cycles in the separating equilibrium, and only they are reelected (this implies that the price for selecting the most competent politicians is the rational opportunistic cycle). These models are difficult to test because of the unobservable candidates that don’t get reelected. Recent studies (Persson and Tabellini, 2000; Shi & Svensson, 2002a; Mink and de Haan, 2006) argue in favor of a moral hazard model in which nor even the incumbent knows their own competence. The incumbent’s capability is revealed after election to everyone, including incumbents themselves. In other words, politicians are “ex ante” unsure about their own ability to handle future problems. Consequently, all kinds of incumbents generate cycles, not only the most competent, which simplifies their study.

Another result from rational opportunistic models is the “rational retrospective” voting behavior. Rational retrospective can be contrasted with the naïve voting behavior of the traditional models. As discussed above, voters judge incumbent based on past economic performance. Alesina (1997) formalizes the problem of the retrospective voting, drawing on works by Alesina and Rosenthal (1995) and Persson and Tabellini (1990). In the problem, the forecast of incumbent’s competence depends on the relative variance of competence and on exogenous shocks on the economy. The equilibrium result is that the rational voter disentangles luck from incumbent’s competence in the best possible way. A naïve voter cannot achieve that: he simply votes for the incumbent when economic growth is high, without any further thought. Thus, a naïve voter will punish an unlucky incumbent, whereas a rational voter would, at least in part, take bad luck into consideration. It is important to note that rational retrospective voting survives even in a model without opportunistic cycle, for instance in economic voting models.

Originally, the theory studied the effect of elections on the real economy (GDP growth rates, unemployment), but research works have shifted toward policy makers’ instruments, such as fiscal policies (e.g. government expenditure and taxes). Drazen (2001) argues that there are two reason to focus on fiscal policy manipulation: the lack of empirical evidence of effects on real economy, and the government’s limited direct control over real variables. Although aggregate macro variables, such as unemployment, growth, inflation, and the deficit, are relatively easily observed by voters, the composition of spending may be subtler and more powerful way for incumbents to engineer opportunistic electoral cycles. Shifting spending to more visible programs that may favor key constituencies is a much easier policy to implement than reducing aggregate unemployment in an election year (Alesina, 1997). Moreover, in developing countries, election-oriented policies are directed towards expenditure, because public spending has a direct and immediate influence on voter’s well-being. So studies have focused on what literature names as Political Budget Cycles (PBC).

Former studies suggest that the existence of Political Budget Cycles was a phenomenon of younger democracies. The main argument is that fiscal manipulation is used more extensively in this kind of countries, where it may be effective because inexperience with electoral politics and lack of information normally available in mature democracies and used by sophisticated voters. It was thought, that the cycles should diminish significantly with the acquisition of experience in electoral politics (Drazen & Brender, 2005). Nevertheless, recent studies have found evidence of budget cycles also in established democracies (Eslava, 2011; de Haan and Klomp, 2013; Ademmer & Dreher, 2015). Discussions has turned towards identifying and analyzing specific conditions under which political budget cycles prevail.

Factors that have been identified in empirical studies are the level of development (Shi & Svensson, 2006), level of democracy (Gonzalez, 2002; Brender & Drazen, 2005), fiscal transparency and fiscal rules (Rose, 2006; Alt & Lassen, 2006; Alt & Rose, 2009; Debrun et al., 2008; Stanova, 2012), electoral rules (Persson & Tabellini, 2003), presence of checks and balances (Streb et al., 2009), informed (sophisticated) voters (Shi and Svensson, 2006), and media freedom (Akhmedov & Zhuravskaya, 2004; Vergne, 2009; Ademmer & Dreher, 2015)

The group of studies that analyzes informed voters, media and media freedom find evidence of a negative relation between more sophisticated voters and media freedom with the amplitude of the cycles for both, developed (Shi and Svensson, 2006; Ademmer & Dreher, 2015) and developing countries (Akhmedov & Zhuravskaya, 2004; Vergne, 2009).

Vergne (2009), for instance, investigates the electoral composition changes in public spending, analyzing data from 42 developing countries (Mexico included) in a period of time comprehending 1975 to 2001. He finds that election-year public spending adjusts toward more observable current expenditures like subsidies and away from capital expenditures. He concludes that a great share of informed voters leads to smaller alterations in the distribution of public spending in electoral years.

On the other hand, Ademmer & Dreher (2015) studies the political budget cycle in 25 countries of the European Union, using data from 1996-2012. He shows that European governments recurrently trigger the economy before elections. He argues that the interaction of two institutions account for the differences between the strength of the cycle for each studied country: fiscal institutions and media strength. Fiscal rules only limit the amplitude of political budget cycles in countries where media is relatively feeble, whereas they fail to do so where the press is strong. He suggests that this may be due to higher political pressure to be corrupt in environments with strong media and the possibility of governments to incur in ‘creative accounting’ in weak-media countries. He concludes that a strong press is key to eradicate political budget cycles: “*Whether incumbents will be detected and punished by electorate when engaging in political budget cycles requires a media that is free to report on government abuses without fearing legal or political punishment and that has the human and economic resources to conduct journalistic investigations and can reach and inform voters.”* Ademmer & Dreher (2015).

This conclusion agrees with the literature survey from Eslava (2011), where she finds scarce evidence supporting the assumption that voters normally reward high-deficit governments, but rather that voters are fiscal conservatives (Peltzman, 1992; Besley and Case, 1995; Alesina et al., 1998; Brender, 2003). Nonetheless, these voters depend on whether they can effectively monitor government behavior.

However, the discussion has not been settled. Some other studies focus precisely on whether the voters reward or penalize opportunistic behavior (as opposed to those who try to only measure the determinants of the amplitude of the cycle). According to Akhmedov and Zhuravskaya (2004), Veiga and Veiga (2007a), Sakurai and Menezes-Filho (2008), Drazen & Eslava (2010), Aidt et al. (2011) and Balaguer et al. (2015) voters reward opportunistic fiscal actions. Nonetheless, evidence for voters behaving as fiscal conservatives has been found in Latin America (Kraemer, 1997), Israel (Brender, 2003), Colombia (Eslava, 2005), Argentina (Jones et al., 2012), Brazil (Litschig and Morrison, 2012) and for countries with high and low levels of democracy (Mourão and Veiga, 2010).

For Mexico, evidence of political budget cycle has been found at the federal level (Gonzalez, 2002; Flores, 2007) and state level (Gámez, 2009; Amarillas and Gamez, 2014). Amarillas & Gámez (2014) results suggest an expansion in the state expenditures during electoral years. However, they argue that this opportunistic behavior does not increase incumbents’ probability to be reelected.

I argue that in consolidating democracies like Mexico, internet facilitates the access to plural information for voters and helps them disentangle the external shocks from the incumbent’s competence and opportunistic behavior. In other words, voters will behave as rational fiscal conservatives if they can access free and plural media information. Information that might be available in these kind of democracies mostly through internet. Otherwise, in the absence of free and plural media, they will act as naive voters confusing opportunistic behavior and rewarding incumbents. Expectation is that, for a given level of internet access, an increase in government spending during the year before elections (and/or during election year) will increase the incumbent party’s vote share.

* 1. ECONOMICS OF MASS MEDIA

This study also contributes to the literature of Economics of Mass Media[[14]](#footnote-14), which is a relatively new area of research that has been growing recently. In this field, there is a considerable number of empirical studies that investigate the political persuasion of mass media (Gentzkow, 2006; DellaVigna and Kaplan, 2007; Gerber et al., 2009; Chun-Fung and Knight, 2009; Genzkow et al., 2011; Enikolopov et al., 2011; Durante and Knight, 2012; Durante et al., 2014; Adena et al., 2015; Miner, 2015); the role of mass media in shaping political and economic outcomes (Besley & Burgess, 2002; Hamilton, 2003; Djankov, 2003; Gentzkow et al., 2004; Strömberg, 2004; Freille et al., 2007; Strömberg, 2010); and specifically, the political economy of the internet (Gentzkow and Shapiro, 2011; Czernich, 2012; Enikolopov et al., 2012; Falck et al., 2014; Campante et al., 2013). There are also theoretical studies proposing models for media bias and their implications (Baron, 2004; Gentzkow and Shapiro, 2005; Mullainathan and Shleifer, 2005; Besley and Pratt, 2006).

Among the theoretical studies, Besley and Pratt (2006) develop a model for political accountability and mass media. Media capture by government is endogenous. Government can capture media and influence political outcomes. In this model, voters use available information to determine whether to keep the current party in power or replace it with the opposition. Information is provided endogenously by the media industry. One of the main implications of the model is that changes in concentration of market affect welfare. Also, media pluralism provides effective protection against capture because the presence of a large quantity of independent media organizations makes it less probable that the government controls news supply in equilibrium.

Regarding the empirical studies, one of the main conclusions is that the media possess a significant power of political persuasion in countries with weak democratic institutions (Enikolopov et al., 2011), and that the media effects on voting are significantly high in settings where an independent media provider enters a market where media is captured by the state (Strömberg, 2015).

Specifically regarding internet, Miner (2015) studies its effect on the elections results of 2008 in Malaysia. He first develops a theoretical model for understanding the influence of internet on voting outcomes in an environment where suppliers of information are captured by government (in Malaysia all media, except for internet, is captured by state according to the author). Author elaborates from previous results from Besley and Prat (2006). Furthermore, Miner (2015) accounts for differences between traditional media (TV, radio, newspapers) and internet media sources. The internet differs from traditional media sources in that it is too expensive to capture[[15]](#footnote-15).

The main empirical prediction of Miner (2015) model is that an increase in internet access will produce a reduction in the incumbent party's vote share, in a captured-media environment. In an intuitive manner, internet permits voters to evade media controls, and empowers them to realize negative signals on candidate competency. The incumbent party's vote share will weaken as an increasing proportion of the population gets access to negative signals. Evidence found by this study suggests that internet growth explains almost half the total swing in percentage points against incumbent in the 2008 Malaysia state elections. Miner (2015) argues that internet facilitates democratization by preventing monopolization of information.

Studies for Mexico, mainly from Political Science, investigate the political effects of mass media (Staing, 2014; Larreguy et al., 2016), agenda setting and media bias in TV and newspapers (Flores & McComb, 2010; Martínez et al., 2015; Corral, 2016), and media effects on voting behavior (Lawson & McCann, 2005; Greene, 2011; Camp, 2013; Larreguy et al., 2014; Díaz & Moreno, 2015). Evidence suggest the existence of media bias (Lawson & McCann, 2005; Martínez et al., 2015), and strong political persuasion on voters (Lawson & McCann, 2005; Larreguy et al., 2014) specially by television (Lawson & McCann, 2005; Greene, 2011; Camp, 2013). Furthermore, television bias during presidential elections has alternated between the ruling party (during 2006; see Greene, 2011) and the opposition (during 2000 and 2012; see Lawson & McCann, 2005, and Camp, 2013).

Social media and #YoSoy132 effects on voting during 2012 elections have also been investigated by Camp (2013) and Díaz and Moreno (2015). These studies suggest that television was slanted towards the PRI (not the ruling party at the time) during those elections. Moreover, social media users and #YoSoy132 supporters were more likely to vote for PRD, more educated, of higher income and more interested in politics.

We argue that in Mexico, traditional broadcast media is highly probable to be captured by incumbents due to the high industry concentration. Therefore, internet enables Mexican voters to better perceive incumbent’s quality even in the presence of broadcast media capture. Following Miner (2015), the expectation is that an increase in internet access will decrease in the incumbent party’s vote share.

* 1. ECONOMIC VOTING

This study also is related to the literature of Economic Voting. This strand of studies follows what is called the ‘responsibility hypothesis’, in which the voters consider the government as responsible for economic performance (Lewis-Beck and Paldam, 2000; Paldam, 2004). Studies that investigate the determinants of incumbent reelection consider mainly the following factors:

1. Unemployment: At central level, some studies find evidence of penalization of expansions in unemployment (Cerda and Vergara, 2007; Cerda and Vergara, 2008; Veiga and Veiga, 2004a, 2004b; Mourão and Veiga, 2010); at local level (Martinussen, 2004); other studies find significant relationship between presidential approval and unemployment (Berlemann and Enkelmann, 2014); and for some others suggest that effects are insignificant (Veiga and Veiga, 2007a; Boyne et al., 2009; and Aidt et al., 2011).
2. Incumbent’s ideology: whether if they have left or right ideology (Kneebone and McKenzie, 2001; Galli and Rossi, 2002; Veiga and Veiga, 2007b; Vila i Vila, 2010; Aidt et al., 2011).
3. Alignment with central government (Sakurai and Menezes-Filho, 2008; Aidt et al., 2011; Cassette and Farvaque, 2014)
4. Past support for the incumbent: electorate party preferences endures from one election to the next one (Brender, 2003; Bosch and Solé-Ollé, 2007; Veiga and Veiga, 2007a; Drazen and Eslava, 2010; Dubois and Paty, 2010; Aidt et al., 2011; Cassette et al., 2013).

Following these studies, and considering the available information, control variables selected for incumbent’s performance were unemployment growth and GDP per capita growth. We control also for incumbent’s party using dummy variables. The objective is to isolate the effect of good economic outcomes of incumbents and voter’s preferences. Even when the focus of this study is not to explain these variables, the expectation would be that voters reward reduction in unemployment, and higher GDP growths. As for the incumbent’s party, expectation is not so clear due to the political shifts that Mexico has experiences since 1997 when the PRI lost supremacy of the federal congress.

# DATA

Most information was collected from different databases of INEGI, the Mexican institute of statistical information. Descriptive statistics are shown in table 1. The following rates per state were obtained from INEGI’s ENDUTIH[[16]](#footnote-16) survey (2001-2002, 2004-2015)[[17]](#footnote-17): Internet users, household internet penetration, education (measured as rate of population that has at least a graduate degree), household personal computers, television and pay television penetration rates.

State expenditure and was also obtained from INEGI, total nominal annual expenditures from 1999 to 2014 measured in thousands of constant 2011 base Mexican pesos. Also from INEGI, we obtained GDP per capita (1999-2006, 2003-2014) and unemployment rate per state time series (1999-2004, 2005-2015). GDP series were chained to calculate GDP per capita growth for the whole period. The unemployment series were not chained as they are not comparable. So, 2005 unemployment growth is a missing value.

For electoral results we consulted the state electoral institute (Instituto Estatal Electoral) of each state, as there does not exist a consolidated information source. In Mexico, the Electoral Federal Institute (IFE, recently renamed as INE) gives autonomy to each state to carry on their own elections. INE is responsible only for presidential elections.

# ECONOMETRIC MODEL

Previous similar studies commonly use in their estimations OLS, with incumbent’s vote share as dependent variable. One of the main caveats with OLS is that they do not provide good estimators when the dependent variable is bounden between zero and one because the effects of any explicative variable cannot be constant through the entire range (unless the range of the independent variable is very limited or zero). Also, the predicted values are not certain to fall in the interval [0,1]. According to Papke & Wooldridge (1996), the problem is analogous to binary data. Although OLS provides a good guide to identify significant statistical variables and it can be used as an exploratory data analysis, it is best to use other methods (Cameron & Trivedi, 2005).

Papke & 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 kind of ratios and proportions in literature. Nevertheless, only a few have studied vote shares, to the best of my knowledge (see Gardeazabal, 2010; Gonçalves, 2013; Mason et al., 2013; and Iyer & Shrivastava, 2015). Regarding the logit/probit models, 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 to the re-elected/no re-elected dummy variable. The fractional probit model has the form:

) (1)

where “i” refers to the state, “t” to the year of elections. The dependent variable, , , stands for popularity of incumbent, measured as the incumbent party’s vote share. ) is the standard normal cumulative distribution function. Explaining variables, , in this first model include proxies for information asymmetry or rationality of voters, for opportunistic budget cycle and control variables for the incumbent’s performance. is the state unobserved effect and its distribution is assumed to be: ), where . Under certain assumptions[[18]](#footnote-18) equation (1) can be rewritten as follows:

(2)

The pooled Bernoulli quasi-MLE (QMLE) estimator, which is consistent and under no serial correlation efficient, is used for estimations, which is obtained by maximizing the pooled probit log-likelihood. I allow also for different intercepts, following Wooldridge (2010 & 2013), because we have unbalanced data. One intercept for each different number of elections per state. Data includes two elections for 10 states (23% of all observations), three for nineteen (67%) and four elections for just two states (10%). So, we allow for three intercepts. In estimations we report average partial effects (see for detailed explanation Papke & Wooldridge, 2008; and Wooldridge, 2010).

Among our explaining variables, information asymmetry proxies (all measured as ratios per state) are: internet users, household internet access, household TV access, and household pay-Tv access, and household PC access. Education (measured as share of population with a least college education) was used to try to separate the effect of information and internet from more educated. It could be that our variables of plural and freer information are capturing only the effect of what literature calls sophisticated voters. Sophisticated voters can infer better incumbent’s competence. We are assuming, in our case, that sophisticated voters are more educated. Because almost all information asymmetry variables are highly correlated (except for TV), we use one variable per estimation to avoid multicollinearity.

Political budget cycle is measured as total state annual expenditure growth the year before elections divided by the average of all pre-electoral years for all the states as indicated in equation (3). Exploratory analysis revealed election year expenditure growth as not relevant for estimations. If our PBC variable is equal to 1, it means that state “i” spend as much as the average for all states for all pre-electoral years.

(3)

Incumbent’s performance variables used in estimations are state GDP per capita growth and unemployment growth rate. An exploratory analysis revealed that it was best to use pre-electoral year variables. This could be explained because of rational retrospective assumption, or nature of data and timing of elections (see next section for data). For control variables, we included a dummy variable for extraordinary elections.

It may be argued that probably internet variables will capture a democratic tendency in the country that could be explained by other factors such as the strengthening of the democratic institutions, the maturity of democratic process, increased awareness of voters, or others. It also may be argued that probably internet variables will somehow capture the effects of education because internet users usually are college educated. Nevertheless, these two variables, time and education, are highly correlated with internet users. So, in order to isolate these effects, We first estimate the following auxiliary equations by ordinary least squares (OLS):

(4)

(5)

(6)

where the variables *internet users* and *education* are the same as defined before. State fixed effects are indicated as . *Time* variable is ordinary time, increasing one unit per election. Squared and cubic time variables are included in equations (5) and (6) respectively in order to identify squared or cubic time effects. Expectation is that internet growth displays exponential growth, but as it increases past certain point it should diminish. Then, after estimations, error residuals are used in a similar model as equation (2). The residuals of each equation are use in three similar models, one per model, where explicative variables, , include internet users, Political Budget Cycle (as defined above), same incumbent’s performance control variables (GDP per capita and unemployment growth), extraordinary elections (dummy control variable) and, additionally, ordinary time and education. Also, two additional intercepts, , for PRI and PRD parties were added. If residuals of auxiliary regressions in second model are significant, we would interpret as an isolated effect of internet (information asymmetry) from other democratic tendency factors (time) and education.

1. RESULTS

The average partial effects of running model (2) are shown in table 2. Internet users, household internet access, household pc access and education result significant and with the expected sign. TV and pay-tv are not significant. According to expectation, the entrance of new freer media (internet) seem to reduce incumbent’s vote share, decreasing the probability of reelection. Although, internet growth has not been constant during the entire period, and not the same for all states, in average internet grew 20% per year. If we consider the average internet’s growth between elections every six years, the effect is not irrelevant, almost twenty percentage points in average comparing from last elections. For instance, in Nuevo León by 2015, internet users grew 181% since last elections in 2009. This implies a reduction of almost thirty percentage points for incumbent’s vote share due to internet users. However, education also results significant and with a greater coefficient than internet variables. Therefore, it is not clear if the effect is due to information asymmetries or voter’s sophistication. We return to this point later, when we review results of second model.

Regarding opportunistic behavior, annual expenditure growth of the year previous to election is significant and with the expected sign. As mentioned before, a previous exploratory analysis revealed that expenditure growth during election year is not significant. This could be explained either by 1) rational retrospective behavior of voters (Alesina, 1997), or 2) the quality of the data and timing of elections (annual data and mid-year held elections). If we consider the cycle effect, the average growth is 8.5% per year. So, our PBC variable is telling us that for each time the expenditure growth of the year previous to election multiplies the average growth, it increases the incumbent’s vote share by 2.3-2.8 percentage points. It’s relatively small. However, contrary to what Amarillas and Gámez (2014) found, this result suggests that an increase in government expenditure the year before elections, holding everything else constant, increases incumbent’s vote share.

Of the incumbent’s performance control variables, pre-electoral year GDP per capita growth is not significant for any estimation. Unemployment growth rate of the year before elections resulted significant but with a positive sign. This is counterintuitive, as we would expect for a higher level of unemployment a lower incumbent’s party vote share and lower probability for reelection. A possible explanation could be the quality of the measurements. It is known to scholars and academics in Mexico that unemployment rates from INEGI tend to underestimate true values, due to misleading classifications of unemployment and informal workers.

For the second model specification where we deal with the high correlation between time and education, we first obtain estimation of the auxiliary regressions explained in section 4. Table 3 contains estimations of equations (4), (5) and (6) using OLS with state fixed effects. The dependent variable is internet users share. Even though not all time variables resulted significant in column three (3), they were very close. In fact, the adjusted squared R increases a little. So, results seem to suggest that there is evidence for a cubic tendency in internet growth with time. Education result significant in all cases.

Table 4 displays results of second specification model as described in section 4, using residuals from auxiliary regression (1), (2) and (3) from table 3. In all cases, we can observe that the effect of ‘internet users’ doubles, keeps significant and with the expected sign. As for the time and education variables, they result not significantly different from zero, but with the expected sign. Thus, first estimations might be underestimating the effect of internet.

The lack of significance in the education variable could suggest that access to plural information provided by internet is more important for voters to assess incumbent’s competence than education itself, even when it is highly correlated with most of the proxies for information asymmetry. On one hand this makes sense because even when voters can get more education and be able to disentangle better luck and macroeconomic conditions from incumbent’s competence, they would not be able to make a good judgement if information available is biased or uncomplete. Furthermore, according to Banerjee et al. (2011), even the poorly educated are able to process coarse information in a relatively sophisticated manner. Therefore, education being not significant may imply that in a scenario where traditional media is captured and for a certain level of education, plural information provided by free media seems to be more relevant for voter’s decisions. On the other hand, this result could also be explained by the difference in growth rates of the two variables. Normally, growth in education is slower compared to the exponential spread of internet, as suggested by the significance of the quadratic and cubic time variables in auxiliary regressions.

Regarding the effect of time, or democratic tendency, these results also give a more robust evidence of the effect of internet users. As mentioned before, even when time was not significant it has the expected negative sign. We could interpret as even when there could be other factors that might explain the decrease in the vote share of incumbents, such as electoral learning, access to plural information provided by internet represents a greater and significant part.

# CONCLUSIONS

This study evaluates the effects of internet and media freedom 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. Specifically, among other critical problems like violence against journalist, broadcast media is considered to be not free because of high industry concentration rate. It’s likely that it might be captured and that it might influence election outcomes. Internet, on the contrary, enjoys more freedom and diversity. In general, in consolidating democracies, studies have shown the strong political persuasion of media, contrary to what evidence found in consolidated democracies.

Using the Political Budget Cycle approach, and strengthening it with insights from Economics of Mass Media and Political Science, our results suggest that an increase in internet access decreases the incumbent’s vote share, reducing the probability of their reelection. On the other hand, an increase in opportunistic spending the year before elections increases incumbent’s vote share. This result seems to shed light on voter behavior debate. Voters seem to behave as fiscal conservatives if they can have access to plural information. We argue that internet provides this source of information, even in the presence of captured broadcast media. Results contradict previous study in Mexico that argued that opportunism does not pay. Opportunism does pay off under these conditions.

For discussion and future research, we assumed no endogeneity between democracy and media freedom, but relation is not clear. De Haan & Klomp (2013) point out that there is a high correlation between democracy and media freedom indexes. Nevertheless, Freille (2007) finds some evidence for causal relationship from freer press to lower corruption. If we consider Mexico, the second private TV chain was founded in 1993. In 1997, the PRI lost majority at the federal congress, and in 2000, the presidency. By 2012, the PRI returned to power, but almost loses it due to the unexpected internet effect. This could be investigated in more detail. It is the case that in weak democracies, new media persuades voters to opposition, but then they are captured if concentration keeps high (Enikolopov et al. 2011).

Even when robust tests were performed on our results, it could be enlightening if an alternative data base can confirm our estimations. Geolocated-IP data bases are available at some cost, similar to what Miner (2015) used for his study. This information could be more reliable.

Also, a model for incumbents that cannot be reelected, in which they are incentivized to make a political career inside their party could change somewhat the expected results. They would not be as motivated as incumbents who want to be reelected. Probably, they would be more into creative accounting, to a certain level that does not damage next party’s candidate image. Also, if TV is more effective than expansive spending, probably cycle will be reflected on TV budget instead of current spending.

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1. FIGURES AND TABLES

**Information Devices Growth in Mexico, 2001-2013**

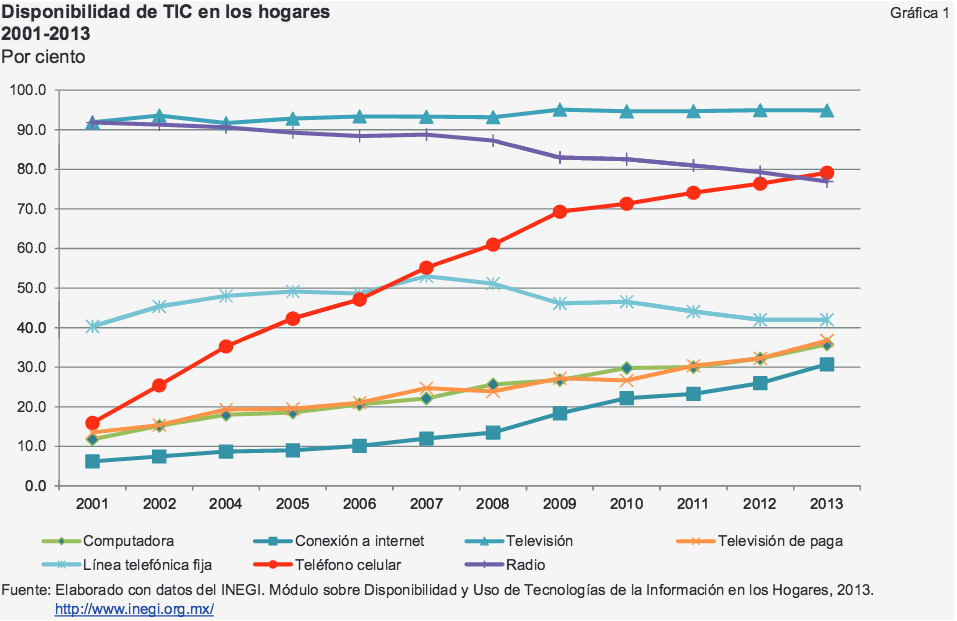


Figure 1. Penetration rates of media devices in Mexican households. Source: INEGI, 2013.



Figure 2. Households with access to internet, OECD Countries. Source: OECD with information from OECD, ICT database and Eurostat, Community Survey on ICT usage in households and by individuals, June 2012; and for non-OECD countries: International Telecommunication Union (ITU), World Telecommunication/ICT Indicators 2012 database. Available at: <https://data.oecd.org/ict/internet-access.htm>

**Household Internet Access in Mexico per State, 2015**



Figure 3. Household Internet Penetration Rates per State in Mexico, 2015. Source: INEGI.

**3 Top vs. 3 Bottom State Internet Users**



Figure 4. 3 Top vs. 3 Bottom State Internet Users. Source: Own elaboration with information from INEGI.

**Household Internet Access Mexico Map, 2015**

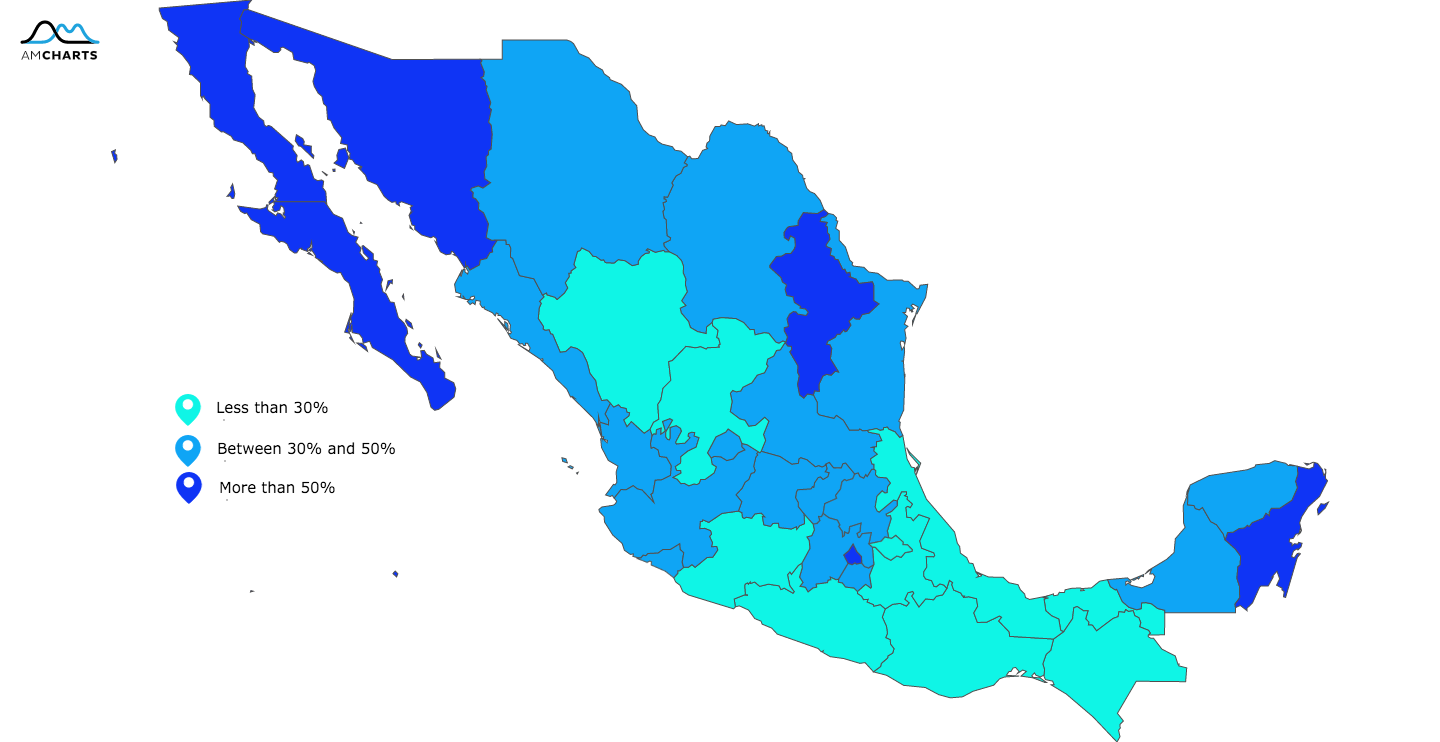


Figure 5. Household Internet Penetration per State in Mexico, 2015. Source: Own elaboration with information from INEGI.

**Political Change in Mexico Map, 2000-2015**

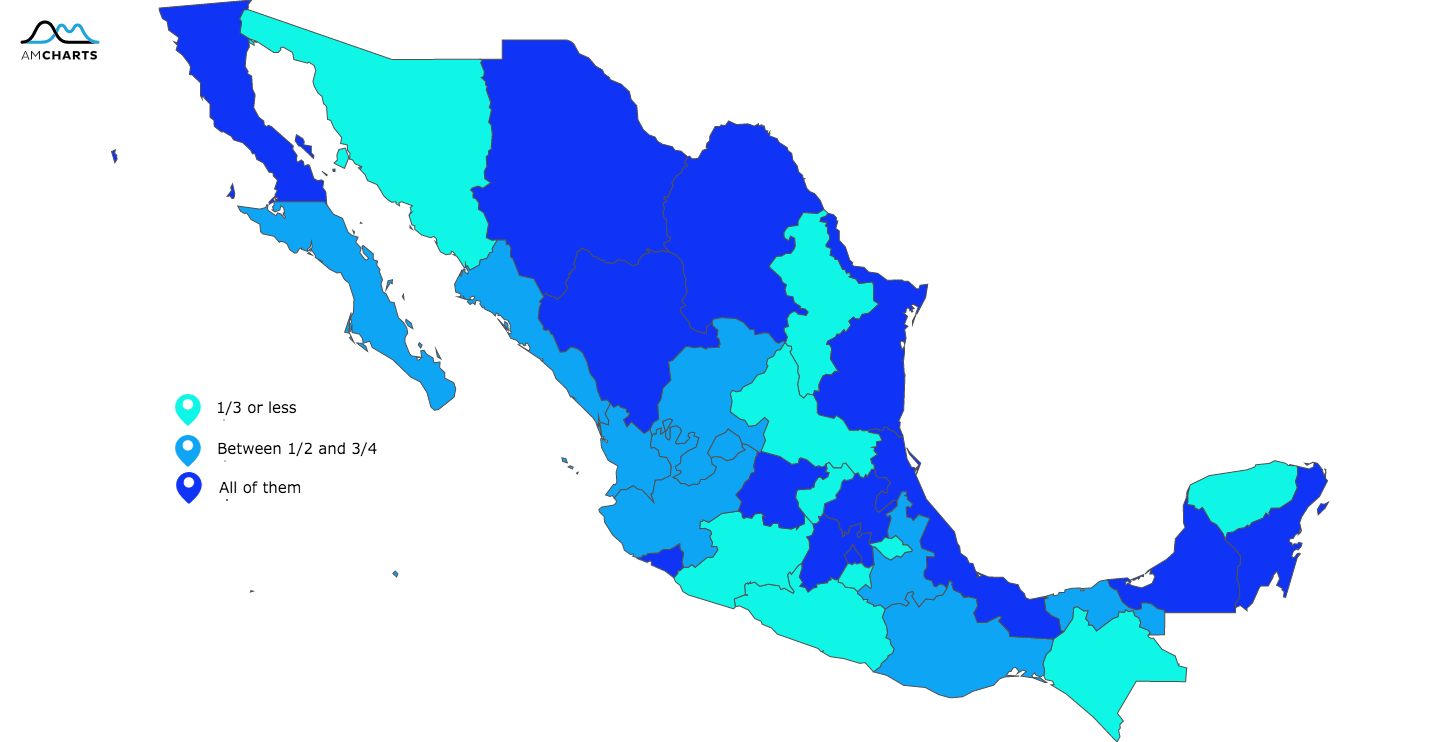


Figure 6. Reelection rate per State (2000-2015). Source: Own elaboration with information from the State Electoral Institutions.

**Freedom of the Press in the World, 2015**

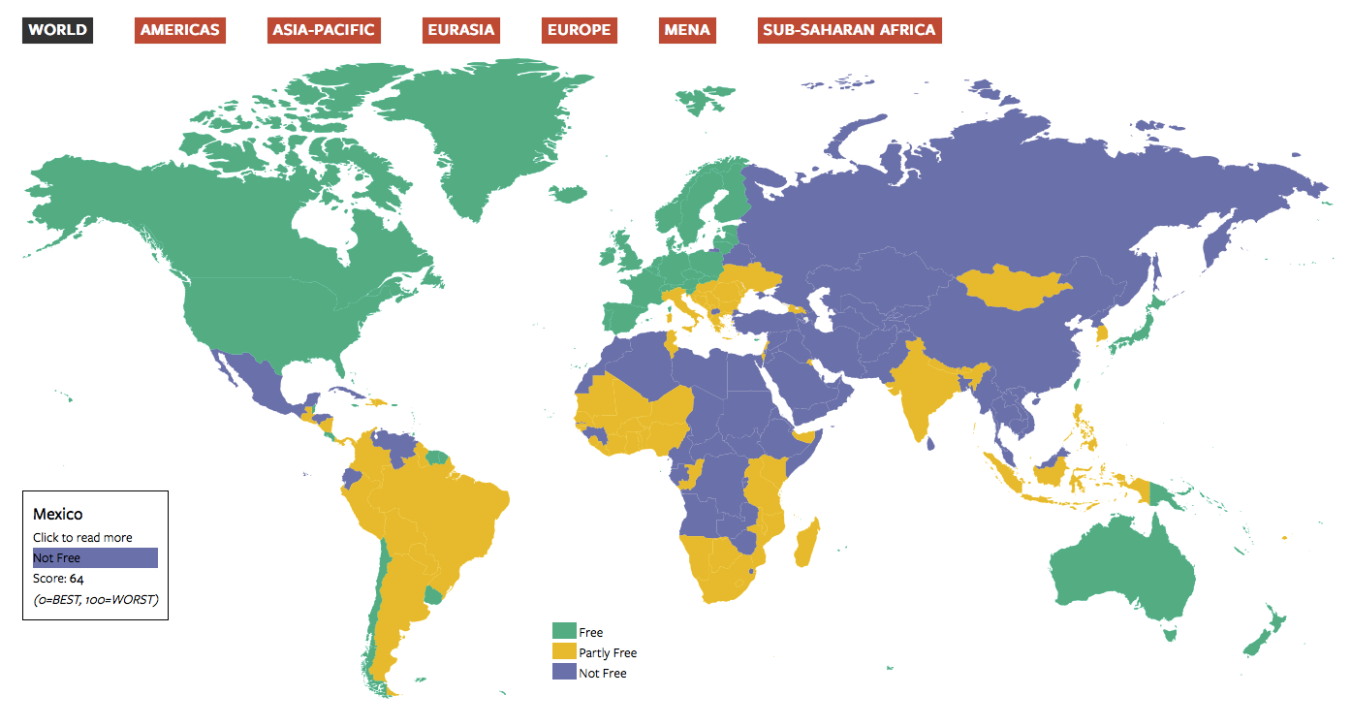


Figure 7. Freedom of the Press classification. Source: FreedomHouse.org

**Table 1. Descriptive Statistics**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Obs. | Missing Values | Min | Max | Mean | Std. Dev. |
| Year | 85 | 0 | 1999 | 2015 | 2006.718 | 4.770 |
| Internet Users | 85 | 0 | 0.006 | 0.704 | 0.218 | 0.157 |
| Education (at Least College Degree) | 85 | 0 | 0.050 | 0.234 | 0.137 | 0.041 |
| Household Internet | 85 | 0 | 0.000 | 0.591 | 0.150 | 0.133 |
| Household PC | 85 | 0 | 0.007 | 0.589 | 0.218 | 0.133 |
| Television | 85 | 0 | 0.659 | 1.000 | 0.922 | 0.077 |
| Pay TV | 85 | 0 | 0.052 | 0.728 | 0.258 | 0.148 |
| PRI | 85 | 0 | 0 | 1 | 0.624 | 0.487 |
| PAN | 85 | 0 | 0 | 1 | 0.259 | 0.441 |
| PRD | 85 | 0 | 0 | 1 | 0.118 | 0.324 |
| Extraordinary Elections | 85 | 0 | 0 | 1 | 0.047 | 0.213 |
| Unemployment Growth (Pre-electoral Year) | 80 | 5 | -0.405 | 0.732 | 0.066 | 0.242 |
| GDP per Capita Growth (Pre-electoral Year) | 85 | 0 | -0.108 | 0.262 | 0.038 | 0.065 |
| Political Budget Cycle | 85 | 0 | -2.661 | 5.155 | 1.170 | 1.138 |
| Incumbent's Vote Share | 85 | 0 | 0.026 | 0.649 | 0.439 | 0.118 |

Table 1. Summary statistics. Sources: INGEI, State Electoral Institutes.

**Table 2. Average partial effects for information asymmetry proxies and PBC.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| Internet Users | -0.169\*\*\* |  |  |  |  |  |
|  | (0.064) |  |  |  |  |  |
| Household Internet Access |  | -0.159\*\* |  |  |  |  |
|  |  | (0.072) |  |  |  |  |
| Television |  |  | -0.001 |  |  |  |
|  |  |  | (0.002) |  |  |  |
| Pay TV |  |  |  | -0.001 |  |  |
|  |  |  |  | (0.001) |  |  |
| Household PC Access |  |  |  |  | -0.002\*\* |  |
|  |  |  |  |  | (0.001) |  |
| Education |  |  |  |  |  | -0.490\* |
|  |  |  |  |  |  | (0.292) |
| Political Budget Cycle | 0.023\*\*\* | 0.025\*\*\* | 0.028\*\*\* | 0.027\*\*\* | 0.024\*\*\* | 0.028\*\*\* |
|  | (0.007) | (0.007) | (0.008) | (0.008) | (0.007) | (0.007) |
| Pre-electoral Year's State DGP per capita Growth | -0.211 | -0.174 | -0.051 | -0.099 | -0.200 | -0.046 |
|  | (0.168) | (0.151) | (0.154) | (0.147) | (0.156) | (0.142) |
| Pre-electoral Year's State Unemployment Rate Growth | 0.133\*\* | 0.141\*\*\* | 0.155\*\*\* | 0.148\*\*\* | 0.148\*\*\* | 0.165\*\*\* |
|  | (0.058) | (0.054) | (0.049) | (0.051) | (0.055) | (0.055) |
| Obs. | 80 | 80 | 80 | 80 | 80 | 80 |
| Wald Test | 60.56 | 77.22 | 83.03 | 174.88 | 107.36 | 72.81 |
| p-value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| McFadden Pseudo R^2 | 0.075 | 0.074 | 0.072 | 0.079 | 0.080 | 0.074 |
|  |  |  |  |  |  |  |

Average Marginal Effects of model (2). Internet users is measured as ratio of state’s population that use internet. Household PC access, Television and Pay-TV and Household PC access are measured as ratio of households that possess each media gadget. Education is measured as ratio of state’s population that have minimum a college degree. Standard errors are shown in parenthesis. Political budget cycle variable is calculated as indicated in equation (3). Significance levels are indicated at 90% (\*), 95% (\*\*), and 99% (\*\*\*).

**Table 3. Auxiliary regressions.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
| Time | 0.132\*\*\* | 0.077\*\* | -0.162 |
|  | (0.010) | (0.029) | (0.144) |
|  |  | 0.013\* | 0.131\* |
|  |  | (0.007) | (0.072) |
|  |  |  | -0.017 |
|  |  |  | (0.011) |
| Education | 1.534\*\*\* | 1.570\*\*\* | 1.440\*\*\* |
|  | (0.254) | (0.280) | (0.262) |
| Constant | -0.247\*\*\* | -0.205\*\*\* | -0.048 |
|  | (0.039) | (0.039) | (0.082) |
| Obs. | 85 | 85 | 85 |
| Adjusted R squared | 0.86 | 0.86 | 0.87 |
| F statistic | 109.82 | 72.32 | 75.35 |
| p value | 0.000 | 0.000 | 0.000 |

Regression results of equations (4), (5) and (6) using OLS with state fixed effects and robust standard errors. Standard errors are shown in parenthesis. Significance levels are indicated at 90% (\*), 95% (\*\*), and 99% (\*\*\*).

**Table 4. Average partial effects internet users and PBC, adjusting for high correlation with time and education.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
| Internet Users (1) | -0.297\*\* |  |  |
|  | (0.147) |  |  |
| Internet Users (2) |  | -0.323\*\* |  |
|  |  | (0.153) |  |
| Internet Users (3) |  |  | -0.354\*\* |
|  |  |  | (0.167) |
| Political Budget Cycle | 0.020\*\*\* | 0.021\*\*\* | 0.019\*\*\* |
|  | (0.007) | (0.007) | (0.007) |
| Time | -0.011 | -0.011 | -0.012 |
|  | (0.010) | (0.010) | (0.010) |
| Education | -0.297 | -0.284 | -0.254 |
|  | (0.344) | (0.355) | (0.366) |
| Obs. | 80 | 80 | 80 |
| Wald statistic | 141.48 | 107.55 | 173.24 |
| p value | 0.00 | 0.00 | 0.00 |
| McFadden Pseudo R^2 | 0.080 | 0.081 | 0.080 |
|  |  |  |  |

Average partial effects of second specification model as described in section 4. Column (1) uses residuals of estimating equation (1) in table 3. Column (2) uses residuals of estimating equation (2) in table 3. Column (3) uses residuals of estimating equation (3) in table 3. Control variables are not shown. Standard errors are shown in parenthesis. Significance levels are indicated at 90% (\*), 95% (\*\*), and 99%.

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3. See Arab Social Media Report by the Dubai School of Government’s Governance and Innovation Program. Retrieved in May, 2014 from: www.arabsocialmediareport.com [↑](#footnote-ref-3)
4. Huang, C. (2011, June 6). Facebook and Twitter key to Arab Spring uprisings: report. *The National*. Retrieved from: http://www.thenational.ae/news/uae-news/facebook-and-twitter-key-to-arab-spring-uprisings-report [↑](#footnote-ref-4)
5. Egyptians could call a free number by regular phone. The message was translated into text and published in twitter with the hashtag #egypt. See: Arthur, C. (2011, February 1). Google and Twitter launch service enabling Egyptians to tweet by phone. *The Guardian*. Retrieved from: http://www.theguardian.com/technology/2011/feb/01/google-twitter-egypt [↑](#footnote-ref-5)
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7. Canning House (2015, July 15). Mexico’s new political reality: The rise of the independents. Canning House. Retrieved from: https://www.canninghouse.org/canningpaperjuly15chapter2/ [↑](#footnote-ref-7)
8. See Economist Intelligence Unit: www.eiu.com [↑](#footnote-ref-8)
9. Center for Systemic Peace (2010). Polity IV Country Report 2010: Mexico. Retrieved from: http://www.systemicpeace.org/polity/Mexico2010.pdf [↑](#footnote-ref-9)
10. See Freedom House: www.freedomhouse.org [↑](#footnote-ref-10)
11. Freedom House 2016 report describes Mexico as one of the world’s most dangerous places for journalists and media workers. Until May 14, 2016 six journalist murders have been reported. See Freedom House: www.freedomhouse.org [↑](#footnote-ref-11)
12. See Reporters Without Borders (RSF): www.rsf.org [↑](#footnote-ref-12)
13. See Freedom House: www.freedomhouse.org [↑](#footnote-ref-13)
14. For a complete review of literature on Media and Politics see Strömberg (2015). [↑](#footnote-ref-14)
15. Author argues that internet is much costlier to capture than traditional media because: first, the diffuse nature of the Internet makes it costly to regulate and second, from a purely economic standpoint, engaging in censorship actions will potentially scare away the FDI. Particularly for Malaysia, the government would have to go against the Internet bill of rights signed in the nineties. FDI is needed for Malaysia's ICT-based growth strategy. [↑](#footnote-ref-15)
16. Information obtained from this survey is state representative starting from year 2010. Results should be interpreted with caution. [↑](#footnote-ref-16)
17. For state elections of years 1999 (Baja California Sur, Coahuila, Guerrero, Hidalgo, México, Nayarit and Quintana Roo) and 2000 (Chiapas, Guanajuato, Jalisco, Morelos and Tabasco), 2001 data was used. Similar results are obtained if we remove these observations. [↑](#footnote-ref-17)
18. For a full description of the model see Papke & Wooldridge (2008). [↑](#footnote-ref-18)