Universidade do Minho
Escola de Economia e Gestão

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An Economic Analysis of Revolutions, Voting Behavior and Voter Turnout

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Doctoral Thesis
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Work developed under the supervision of:
Professor Doctor Linda Gonçalves Veiga

and
Professor Doctor Luís Aguiar-Conraria

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In memory of my father Roger A. Sawaya

My inspiration and pride; yesterday, today and forever

Statement of Integrity

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

Uma Análise Económica de Revoluções, Comportamento Eleitoral e Participaçao Eleitoral

Resumo

Esta tese compreende três artigos na área da Economia Política. O primeiro analisa as determinantes de revoluções bem-sucedidas (definidas como processos que levam à saída de um líder do cargo, com base em grande participação popular (Goemans et al., 2016)) num grande número de países; o segundo e o terceiro estreitam a análise a um país em particular do Oriente Médio, o Líbano, onde o comportamento e a participação eleitoral são respectivamente estudados.

O primeiro artigo examina o impacto de fatores relacionados com a economia, a política, os meios de comunicação, a governança e as tecnologias da informação e comunicação (TIC) sobre a probabilidade de revoluções bem-sucedidas, em mais de 150 países, no período de 1996 a 2015. Os resultados confirmaram que o rendimento per capita e o crescimento do PIB real, em 5 anos, diminuem a probabilidade de revoluções bem-sucedidas. Demonstrámos também que novos fatores que emergiram das mais recentes análises da Primavera Árabe tiveram impacto na ocorrência de revoluções bem-sucedidas nos países Árabes. Menos censura dos meios de comunicação social e melhorias na governança e nas TIC diminuíram a probabilidade de revoluções bem-sucedidas. Também há evidência de que uma indústria petrolífera bem-sucedida gera um efeito estabilizador, particularmente em países não democráticos.

O segundo e o terceiro artigo focam-se no caso Libanês. O propósito do segundo é estimar os efeitos de fatores religiosos, socioeconómicos e políticos nas escolhas partidárias dos eleitores Libaneses. O Líbano tem um sistema eleitoral multiconfessional e pluripartidário. Independentemente de sua afiliação religiosa, os eleitores votam para todos os cargos do distrito, num único boletim eleitoral. Podem escolher tantos candidatos quanto o número de cargos atribuídos ao distrito eleitoral e podem remover ou adicionar candidatos de uma lista pré-estabelecida — desde que o equilíbrio sectário da lista se mantenha. Sendo o Líbano um país multiconfessional, diverso e pluralista, não é surpresa que fatores religiosos sejam estatisticamente significativos. Não obstante, a economia continua a ser um fator relevante: distritos eleitorais com elevados níveis de rendimento tendem a votar mais no Hezbollah e no Movimento

do Futuro e menos em Independentes; aumentos na taxa de desemprego penalizam o Partido Social Nacionalista Sírio. Os Independentes obtêm melhores resultados eleitorais quando o número de ministros Independentes é maior. Adicionalmente, como esperado, o número de bombardeamentos e assassinatos tem um impacto significativo nos resultados eleitorais. Os candidatos independentes são penalizados em distritos que testemunham mais bombardeamentos e assassinatos em anos eleitorais.

Finalmente, o terceiro artigo estuda o impacto de fatores económicos, políticos, sociodemográficos e institucionais nas taxas de participação eleitoral, nos 26 distritos administrativos Libaneses, durante as eleições parlamentares que ocorreram entre 1996 e 2018. Estimando o sistema GMM, concluímos que quer um aumento da margem de vitória quer do desemprego diminuem a participação eleitoral.

Palavras-chave: Votação económica; Participação eleitoral; Revoluções; Desempenho económico; Governança; Religião..

An Economic Analysis of Revolutions, Voting Behavior and Voter Turnout

Abstract

This thesis comprises three papers within the discipline of political economy. The first paper focuses on new determinants of successful revolutions (defined as processes leading to a leader's exit from the office, based on sizeable popular participation (Goemans et al., 2016)) in a large number of countries. The second and third narrow the analysis to a particular Middle Eastern country, Lebanon, where we study voting behavior and voter turnout, respectively.

The first paper examines the impact of economic, political, media, governance, and information and communications technology (ICT) factors on the probability of successful revolutions in more than 150 countries over the 1996-2015 period. Results affirmed the effect of income per capita and 5-years real GDP growth in lowering the probability of successful revolutions. We also show that new factors emerging from the recent analysis of Arab uprisings had, before their occurrence, impacted successful revolutions in other countries. Less media censorship and increases in governance and ICT lower the probability of successful revolutions. There is also evidence that a successful oil industry has a stabilizing effect, particularly in non-democratic countries.

The second and third papers focus on Lebanon. The second paper aims to estimate the effects of religious, socio-economic, and political factors on party electoral choices of Lebanese voters. Lebanon has a multi-confessional and multi-party electoral system. Regardless of their confessional affiliation, voters vote for all district seats in a single ballot paper. They can choose as many candidates as the number of seats assigned to the constituency. They can remove or add candidates from pre-arranged electoral lists as long as the list's sectarian balance remains the same. In this multi-confessional, diverse, and pluralistic country, it is not surprising to find statistically significant results associated with religious factors. Nevertheless, the economy is still a relevant predictor of political parties' vote shares: electoral districts with high-income levels tend to vote more for Hezbollah and Future Movement and less for Independents, and increases in the unemployment rate penalize the Syrian Social Nationalist Party. Independents benefit when the number of independent ministers is large. Moreover, as expected, bombings and assassinations have a statistically significant impact on electoral results. Independent

candidates are penalized in districts that witness more bombings and assassinations during election years.

Finally, the third paper studies the impact of economic, political, socio-demographic, and institutional factors on the turnout rates in 26 administrative districts during the Lebanese parliamentary elections held between 1996 and 2018. Applying the system-GMM method, we found evidence that an increase in the winning margin and unemployment lower participation in elections.

Keywords: Economic voting; Voter turnout; Successful revolutions; Economic performance; Governance; Religion.

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List of Abbreviations

AMAL	Amal Movement
CAS	Central Administration of Statistics
CIA	Central Intelligence Agency
EU	European Union
FE	Fixed Effects model
FM	Future Movement
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HEZ	Hezbollah
ICT	Information and Communications Technology
IFES	International Foundation for Electoral Systems
IND	Independents
Inf. Int.	Information International
LADE	Lebanese Association for Democratic Elections
LCP	Lebanese Communist Party
LCPS	Lebanese Center for Policy Studies
LL	Log-Likelihood
LPOS	Lebanon Public Opinion Survey
M14	Independents of March 14 coalition
M8	March 8 coalition
MENA	Middle East and North Africa
MEPV	Major Episodes of Political Violence
MOIM	Ministry of Interior and Municipalities
MOSA	Ministry of Social Affairs
NDI	National Democratic Institute
OLS	Ordinary Least Squares
PC	Principal Component
PM	Prime Minister
POLS	Pooled Ordinary Least Squares

POL	Political
PRIO	Peace Research Institute Oslo
PSP	Progressive Socialist Party
RE	Random Effects model
SD	Standard Deviation
SOCECO	Socio-economic
SSNP	Syrian Social Nationalist Party
SSR	Sum of Squared Residuals
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations International Children's Emergency Fund
USD	Urban Social Disorder
VIF	Variance Inflation Factor
WDI	World Development Indicators
ZIP	Zero Inflated Poisson
ZINB	Zero Inflated Negative Binomial

INTRODUCTION

For some earlier scholars, the term, political economy, applied to the whole field of economics, and, in some cases, it overlapped with development thinking. Nevertheless, in the 1950s and 60s, two distinctive movements in political economy were taking place in the Virginia and Chicago schools, opening the floor to debates on a range of important topics, such as political institutions, distortions in the policy process, and government failure. In general, the critical issues in the field of political economy focus, among others, on the role of institutions in resolving conflicts of interest and promoting common interest, and on incentives and selection in institution design (Besley, 2016).

Political economy as a research field embraces a wide range of foci, such as the development of laws and social relations in material production; the organization of a system of consumption and production; or the application of economic logic to political behavior (Yandle, 1990). However, in recent years, the interest in understanding how the policy process affects policy outcomes has been increasing. Today, political economy research ranges from collective decision-making mechanisms to elections, political business cycles, political parties, institutions and economic growth, institutions and distribution and redistribution, and their role in conflicts and violence.

This research focuses on three main topics in political economy: revolutions and the economy, voting behavior and political parties, and voting turnout. First, we reevaluate the economy's role in successful revolutions before examining new determinants in an extensive range of countries, including the recent Arab uprisings in the Middle East. Then, we focus on a particular Arab country, Lebanon, where we investigate the power of economics in explaining the vote share of six main Lebanese political parties and independents, before analyzing the factors that explain turnout in the last five parliamentary elections that took place in Lebanon.

The problem of identifying the preconditions of revolutions has long been a concern for political scientists. Plato and Aristotle argued that poverty might be a cause of political revolution, while Tocqueville and Brinton assert that revolutions are preceded by a significant economic development increase (Tanter & Midlarsky, 2013). A comprehensive explanation of these two approaches was advanced by Davies (1962), who explained that revolutions are preceded by steady long term increases in economic development, followed by a sharp reversal just before the revolution's outbreak.

For scholars of modernization, economic development increases the individual capacity to engage in political action and democracy (Lipset, 1959). Such modernization could lead to rising and unmet expectations, popular frustration, and violent revolutions in societies that lack the strong political institutions necessary to absorb the mobilized masses into politics (Huntington, 1968). In general, higher-income should increase demands for democratization, thus providing a fertile climate for revolutions in autocracies. Collier & Rohner (2008) found that income growth makes democracies safer, but it also makes autocracies more prone to violence. In recent years, almost all scholars have emphasized the structure of economic relations, the importance of existing grievances, and political ideologies' role in igniting violent conflicts (Boix, 2008).

The economy features in the development of almost every type of social conflict; however, the relatively recent Arab uprisings, where large crowds demanded regime change and, in some cases, old regimes were eventually forced out, opened the space for new factors to be investigated. These factors are diverse. Some authors emphasize social media's role in triggering these uprisings (Mortada & Salem, 2012; McGarty et al., 2013; Soengas, 2013; Tudoroiu, 2014), as it gives people a new space of freedom to frame their grievances. Others point out how the lack of governance, the rule of law, corruption, and cronyism help sustain authoritarian regimes (Sika, 2012), increasing the latter's chances of facing revolutions (Tiruneh, 2014).

These factors have never been considered concomitantly in a model explaining the outbreak of revolutions; thus, an opportunity has arisen to reevaluate the triggers previously advanced in explaining the causation of revolutions (mainly economic factors) and exploring new ones. This scientific investigation's relevance is that it elucidates the main causalities behind either the observation of the event – in the present context, the case of successful revolutions – or their absence. The first paper, which we develop in Chapter 1, "New Determinants of Successful Revolutions, " will seek to extend Collier and Rohner's (2008) work and test it across many countries for the period 1996-2015. This study contributes to the existing literature by considering various variables ranging from economic, political, media, and governance factors to information and communications technology (ICT). We define our dependent variable, 'successful revolutions,' as processes leading to a leader's exit from the office, based on sizeable popular participation (Goemans et al., 2016). The Random-Effects Probit method will be considered the primary estimation method to deal with our dichotomous dependent variable. Another technique, the 'Poisson regression model,' will be used when estimating other forms of social unrest –– such as the total number of demonstrations and riots, attempted coups d'état, and individual events of

violence against the government –– that are observed as a count number. The chapter also discusses the social revolutions that break out in some Arab countries.

Our investigation in Chapter 2 focuses on a particular Arab country, Lebanon, where we analyze which factors influence a party's vote share at the district level in four parliamentary elections. Earlier literature on voting behavior shows that voters respond to economic conditions, mainly inflation and unemployment, where they assess the competency of the government with regards to economic conditions (Kramer, 1971; Goodman & Kramer, 1975; Tufte, 1975, 1978; Hibbs, 1982; Lewis-Beck & Rice, 1992; Kiewiet & Udell, 1998). This hypothesis's support has been mainly found in two-party system countries, while in multi-party system countries, voters evaluate political parties based on their policies (Swank & Eisinga, 1999). Other factors might affect a voter's choice, such as religious affiliation. Voters tend to choose a candidate from their own faith (Kane, Craig, & Kenneth, 2004; Botterman & Hooghe, 2009; Campbell et al., 2011). If there were a country where one would not be surprised to find the religious factor to be relevant, it would be Lebanon. It is one Arab country of particular interest to this study. It is the most diverse, multi-confessional, and pluralistic country in the Arab and Middle Eastern regions. It has more than 18 religious sects and more than 30 political parties. This diversity is reflected in its constitution and electoral and political systems, the structure of which stipulates that the president's position is held by a Maronite Christian, the premiership by a Sunni Muslim, and the Speaker of the House by a Shiite Muslim. Parliamentary seats are held equally between the Muslim and Christian communities and are distributed among the confessional groups of both communities across Lebanon's different geographical regions. Another exciting feature of Lebanon is its political instability amid turmoil in the region. Despite these particularities, studies on Lebanon's economic voting are very scarce (Harik, 1980; Hourani & Sensenig-Dabbous, 2012; Lebanese Association for Democratic Elections, 2014). These studies, which focus on one parliamentary election without accounting for each political party's specificities in explaining their vote share, show that political and religious factors were predominant in affecting the voter's choice. This makes Lebanon a fertile ground for political economy studies in general and voting behavior in particular. Therefore, we contribute to the empirical analysis of voting behavior by estimating the effects of economic, religious, and political factors on party choice. To our knowledge, this chapter is the first to empirically analyze the factors influencing political parties' vote shares in the four parliamentary elections, covering the 26 administrative districts in Lebanon, that have taken place since the civil war – 1996, 2000, 2005, and 2009. Six major political parties and independents are considered: Amal, Hezbollah, Lebanese Communist Party, Progressive Socialist Party, Future Movement, Syrian Social Nationalist Party, Independent of March 14 coalition and Independents. We estimate a different model for each party

based on the most relevant variables. The pooled OLS method is used with robust standard errors. Given the small number of observations, a series of tests are performed to check for multicollinearity and assess the sample size problem's severity.

The impact of economic, sociodemographic, political, and institutional factors on the turnout rates, in 26 administrative districts, over the Lebanese parliamentary elections between 1996 and 2018 is the theme of Chapter 3. The reasons explaining why people participate in elections have been largely explored. Early studies advanced factors related to partisanship, sense of duty (Fiorina, 1960; Riker & Ordeshook, 1968), and cost-benefit calculation, where the expected benefits of voting should outweigh the costs (Downs, 1957b). There is currently a widespread consensus that economic, sociodemographic, political, and institutional factors have more explanatory power in explaining turnout. In particular, turnout in national elections is explained more by campaign expenditures, election closeness, and registration requirements. In contrast, population size and composition, simultaneous elections, previous turnout levels, the electoral system, and economic development play a more critical role in subnational elections (Cancela & Geys, 2016). Economically more advanced countries have a higher turnout rate (Blais & Dobrzynska, 1998; Fornos et al., 2004). However, the discussion of factors justifying why people turn out to polls has been mainly conducted in well-established western democracies. Very few studies have been piloted in the Arab countries and even less in Lebanon (Harik, 1980; Alhaber, 2007; de Miguel et al., 2015; Mourad & Garrote Sanchez, 2019; Garrote Sanchez, 2021). Factors such as personal and political ties between voters and politicians (Harik, 1980), patronage at the level of low-income citizens, on which leaders of confessional communities depend to get more votes (Miguel et al., 2015), voter age, unemployment, political affiliation, and partisanship were among the most important determinants of turnout (Mourad & Garrote Sanchez, 2019). The very few studies focusing on Lebanon open the possibility further to explore the determinants of voter turnout in this country. This paper contributes to the literature on voter turnout by empirically studying, for the first time, all elections that took place at the end of the civil war (except for 1992). It differs from previous studies in several ways: by aggregating the analysis over five parliamentary elections and 26 administrative districts; by considering elections taking place under different electoral systems; and, by expanding the set of explanatory variables of voter turnout in Lebanon to variables such as political fragmentation and the winning margin of the difference in the percentage of votes between the most voted list and the second most voted list. System-GMM is the primary estimation method used in this paper. Fractional Probit and Beta regression were also used as alternative estimation methods. Several tests were implemented to check the robustness of the regressions.

The last part concludes this dissertation. It presents and discusses the main results of the previous three chapters. The conclusion also addresses the main limitations faced and suggests some directions for future research.

CHAPTER 1: NEW DETERMINANTS OF SUCCESSFUL REVOLUTIONS

Abstract

This paper examines the impact of a range of factors on the probability of successful revolutions in more than 150 countries over the 1996-2015 period; the factors selected for this study are drawn from economic, political, media, governance, and information and communications technology (ICT) domains. Results affirm the effect of income per capita and 5 years real GDP growth in lowering the probability of successful revolutions. It also shows that new factors emerging from recent analysis of the Arab uprisings, and occurring prior to the events in the Arab countries, had impacted successful revolutions. Less media censorship, and an increase in governance and ICT lower the probability of successful revolutions. There is also evidence that oil has a particularly stabilizing effect in non-democratic countries.

Keywords: Successful revolutions; GDP; Media censorship, Oil; Governance; ICT.

1.1. Introduction

At the close of the Cold War, the world observed a technological and economic advancement that would prove to be unsustainable alongside, and in addition to, the Eurozone debt crisis, the occurrence of a number of financial crises – the last being that of 2007. The political scene was also substantially marked by the rise of world terrorism and its retaliatory repercussions, such as the wars in Iraq and Afghanistan, and the more recent Arab uprisings. Today, political instability has been revealed as a pervasive global phenomenon, with an increasingly deteriorated global level of peace (Institute for Economics and Peace, 2018). The emergence of these confrontations necessitates new inquiries, not least of which is the need to determine the factors that trigger revolutions.

According to the economic theory of revolutions, known as the 'by-product theory', self-interest is one of the prime causal factors motivating people to participate in a revolution (Tullock, 1971). Discontent about economic conditions increases hostility towards the government and therefore increases revolutionary participation. Such discontent might be triggered by one or more of the following: excessive taxation and inflation (Cartwright et al., 1985); a decrease in the rate of income growth (Breton, 1969; McGuire, 1981; Collier & Hoeffler, 2005); expenditure cuts (Ponticelli & Voth, 2011); and/or a high level of inequality (Acemoglu & Robinson, 2001). However, in democratic societies, the probability of violent revolutions tends to be smaller (Collier & Rohner, 2008; Tiruneh, 2014), especially when these societies benefit

from a high level of income (Collier & Rohner, 2008; Knusten, 2014). Other factors have emerged with the relatively recent Arab uprisings. These are mainly related to social media (Mortada & Salem, 2012; McGarty*.,* 2013; Soengas, 2013; Tudoroiu, 2014), governance, the rule of law, corruption, and cronyism (Sika, 2012).

Most of the literature on the determinants of revolutions is based on qualitative work and includes several theoretical contributions; only a few econometric studies focus on the economic determinants of revolutions and on the new factors that emerged with the Arab Spring. This paper contributes to the literature by investigating the impact of the economy, governance, information and communications technology (ICT), and media censorship, among other factors, on the probability of successful revolutions. These factors have never been considered concomitantly in a model explaining the outbreak of revolutions. Thus, an opportunity has arisen to explore such new factors and reevaluate the triggers previously advanced. The relevance of this scientific investigation is that it elucidates a large number of causalities behind either the observation, or the absence, of successful revolutions.

This paper aims to answer the following questions: Do more media censorship, increased level of governance, and more advanced ICT affect the probability of successful revolutions and, do they better explain causality vis-à-vis revolutions than traditional factors that emphasize political and economic factors? To address these questions, we extend the work of Collier and Rohner (2008) by analyzing other indicators and by considering more countries in a different period (1996-2015). This will allow us to benefit from data on a large number of countries of varying regime types and economic development levels (approximatively 193 UN member states). This timespan was chosen because we emphasize the impact of media censorship, governance, and information technology on the occurrence of revolutions. Data on such indicators was not available in previous years.

The choice of the following several parameters was useful in reaching the main results; a new measure of governance and ICT; 5 years average rate of economic growth, rather than long term growth or income growth; and, an indicator of media censorship rather than social media. The resulting findings were: an increase in the income level and economic growth lowers the probability of successful revolutions and is contingent on the regime type; and, a less censored media, a higher level of governance, and more advanced ICT lower the probability of successful revolutions. We found that factors which had surfaced in previous analyses of Arab uprisings also had statistically significant effects on revolutions occurring a long time before those Arab Spring events. There was also evidence that oil income can lower the probability of successful revolutions, particularly in non-democratic countries.

The paper is organized as follows: Section 1.2 presents the literature review on the determinants of revolutions. Section 1.3 discusses the empirical model and defines the data used in the empirical work. Section 1.4 presents the methodology used. Empirical results are discussed in section 1.5. Section 1.6 focuses on Arab countries. Section 1.7 discusses other forms of social unrest and, finally, Section 1.8 concludes the chapter.

1.2. Literature review

The different factors usually discussed in the literature on revolutions will be analyzed in the first sub-section, while the second sub-section will be considering new factors that have emerged with the relatively recent Arab uprisings.

1.2.1. Determinants of revolutions

The early literature regarding revolutionary activity was rich in attempts by social scientists to explain the causes and origins of revolutions. Those who participate in revolutions were described as 'unselfish', caring only about the public welfare of the society (Goldstone, 1980).

Economic theory was used to challenge this view of revolution, with many economists (Ireland, 1967; Tullock, 1971; Silver, 1974) considering self-interest as the motivation for people's participation in revolutions. In their interpretation, individuals compare present values of gains and costs when deciding whether to participate in revolutions. The public good aspect is of little importance, given the fact that individuals' participation will not have a significant influence on the outcome (Tullock, 1971). Any collective goods produced by the revolution would be able to be consumed, whether an individual participated or not (Silver, 1974).

When an individual's economic status becomes incompatible with his social and political situation, the increased hostility toward the government will increase his revolutionary participation (Olson, 1963; Silver, 1974). Such discontent about economic conditions might be triggered when people have no means by which to meet their increasing expectations resulting from a rapid political or social change (Davies, 1962; Olson, 1963; Gurr, 1968; Gurr, 1970). According to Davies' (1962) J-curve theory, a sharp reversal in economic conditions will make people unhappy, dissatisfied, and frustrated, leading them to resort to political violence.

A rapid monetary growth which induces a high rate of inflation is an example of an economic condition that might polarize the society: those who lose from the high rate of inflation will be set against those who

win. Such an event stimulates group conflict and leads to political instability (Friedman, 1977). In a study of 54 developing countries over the period 1955-1975, Cartwright et al. (1985) found that an increase in the rate of inflation raises public hostility toward the central government, which further induces participation in revolution. In the event of a revolution effectively taking place in a country, the increase in the inflation rate increases the duration of a revolution, which serves as a proxy for revolutionary victory.

Income growth is another example of economic conditions that could create widespread unrest among citizens. A decrease in the rate of income growth encourages individuals to participate in social movements. Individuals will seek to understand the reasons behind the modification in their situation through social movements (McGuire, 1981; Breton & Breton 1969). Their preferences become more materialistic, as they might be seeking self-serving opportunities rather than accountability, and society becomes more prone to political violence (Collier & Rohner, 2008). In the short term, higher income growth reduces the probability of both successful and attempted revolutions. However, the impact of long term growth is only statistically significant on revolutionary attempts (Knusten, 2014).

Participation in social movements is correlated not only to the growth in income level but also to income inequality. Acemoglu and Robinson (2001) found that income inequality increases the probability of political instability in both democratic and non-democratic societies. In democratic societies, the poor impose higher taxes on the rich. This makes the rich want to fight for power and increases social unrest. In non-democratic societies, the threat of social unrest and rebellion (Collier & Hoeffler, 2005; Nimeh, 2012; Hlasny & Verme, 2013; Tiruneh, 2014) by the poor, who are excluded from political power, increases with inequality, especially during periods of crisis. However, Collier (2006) found that inequality, whether of incomes or assets, may well generate intense political conflict, but such conflict does not usually escalate to violent conflict. If the state is weak, direct action from the population will not affect inequalities (Soifer, 2013).

Democracies display measures that reduce the probability of violent revolutions (Collier & Rohner, 2008; Tiruneh, 2014). These measures: make governments more accountable; tend to promote negotiations among different stakeholders in the society; develop a redistributive system; and, deal with group demands. Those autocratic or authoritarian states that are not able to meet people's needs due to economic mismanagement and the incapacity to find appropriate and efficient socio-economic policies may have a higher chance of facing revolutions (Tiruneh, 2014).

Collier and Rohner (2008) considered, at the outset of their research, government repression as a dependent variable and found that the level of democracy has a negative and significant effect on the dependent variable. They then studied the impact of democracy and the level of income on different forms of political violence (riots, coups, revolutions, assassinations, political strikes, and demonstrations). Results showed that development significantly reduces political violence but that democracy is not significant. When the interaction between democracy and income is introduced, the direct effect of democracy appears to be statistically significant. Below a certain level of income per capita, democracy increases the incidence of rebellion, which implies that democracy has more benign effects in richer countries. Similar results were found by Knusten (2014), where higher income reduces the probability of successful revolutions more in democracies than in dictatorships.

Some sources of growth, like oil production, are more likely to yield large windfalls to the regime (Ross, 2001; De Mesquita & Smith 2010). The probability of revolution will be lowered, as governments may weaken internal opposition through investing in repressive capacity (Wintrobe, 1998) or co-opting actors that constitute potential threats (De Mesquita & Smith, 2010).

Another correlate of revolution is the level of educational attainment before the outbreak of the disturbance. Lipset (1959) argues that, when an individual becomes more educated, he is more likely to believe in democratic values and support democratic practices. He found that the occurrence of revolution is negatively correlated with the level of educational attainment. According to Huntington (1968), when people become more educated and urbanized as a result of economic development, they demand greater political participation and more civil rights. If such popular demands are not addressed, discontent will surface, and political violence, including revolution, is possible. The probability of revolution tends to increase below a mid-level of economic development (Tiruneh, 2014).

Instability and social unrest are also correlated to austerity measures, expenditure cuts, and excessive taxation (Silver, 1974; Ponticelli & Voth, 2011). Expenditure cuts increase the frequency of different forms of unrest, such as attempted revolutions. While these are low probability events in normal years, they become much more common as austerity measures are implemented. Higher levels of expenditure cuts are associated with more unrest. When summing up the full range of forms of unrest (riots, demonstrations, political assassinations, and attempted revolutions) in a single year, Ponticelli and Voth (2011) find that these events are positively and significantly correlated to the changes in the budget balance. The authors also find that higher taxes and lower expenditures are associated with more unrest;

however, the relationship is not statistically significant. A higher level of unrest is witnessed in more indebted countries (Woo, 2003).

Other social conditions increase the risk of rebellion: larger population size; polarized societies (Collier & Hoeffler, 1998); highly geographically dispersed population, making government control more difficult; the existence of a dominant ethnic group with the power and interest to exploit the minority, who, when sufficiently fearful of permanent exploitation, might decide to fight; and ethnic and religious homogeneity (Collier, 2006).

Recently, scholars have been interested in studying the impact of globalization on different aspects of social unrest. Many argue that globalization has a pacifying effect (Hegre et al., 2003; De Soysa, 2003; Besley & Persson, 2011) unless its gains do not benefit citizens equally. Colantone and Stanig (2018) show that, when welfare gains from trade were not equally distributed within Europe, support for the rise of nationalist and radical right political parties resulted from Chinese import shocks. Social inequality, promoted by globalization, can lead to political instability, as governments tend to shift the burden of taxes from the capital to labor as globalization progresses. Rimstad (2012) argues that social globalization –– which includes measures of the international flow of information, personal contact across borders, and cultural proximity –– has a strong influence on the likelihood of internal conflicts. As for economic globalization, only restrictions appear to increase frustrations and cause riots.

1.2.2. Arab uprisings and new determinants of revolutions

Recent years have witnessed an increase in the number of social revolutions taking place, particularly in some Arab countries. The causes of these uprisings have been attributed to socioeconomic factors such as income inequality, increases in food prices, high unemployment, inefficient government intervention, and social media.

Most of the Arab rentier states have a patriarchal government controlling both politics and the economy and receiving wealth creation, which leads to substantial income inequality (Nimeh, 2012; Sika, 2012; Hlasny & Verme, 2013). According to the Middle East and North Africa (MENA) economic monitor report (Ianchovichina et al., 2015), income inequality was not at the top of the grievances voiced before the Arab Spring. Instead, middle-class people complained about the decline in their standards of living related, mainly, to the shortage of quality jobs, dissatisfaction with the quality of public services, and government accountability.

Increases in food prices, which exacerbate the living conditions of the poorest in society, especially in countries where expenditure on food constitutes a high share of household income, also help to explain the uprisings. For example, Egypt, Morocco, Tunisia, and Yemen experienced many episodes of food riots that coincided with a peak in food prices. The first was in 2007-2008, and another one was registered in 2010 (Ansani & Daniele, 2012).

Another fundamental reason seems to be high unemployment levels, especially among the female youth (Sika, 2012). In the Arab world, young females have among the lowest labor market participation rates in the world. Additionally, human capital is highly underemployed due to a mismatch between the qualification of workers and the jobs offered, which are concentrated in sectors based mainly on agricultural activities, extractive, refining, low tech manufacturing, and tourism (Ansani & Daniele, 2012). The youth unemployment problem, when coupled with the youth demographic structure and the high number of entrants into the labor market, increases the tendency towards violence and social unrest.

Inefficient government intervention and redistribution characterize Arab economic systems (Malik & Awadallah, 2011). The liberalization process of the 1990s, which fueled economic growth, especially in North African countries, excluded the middle class and the youth, and was not accompanied by political reforms capable of ensuring more civil rights to the population (Joya, 2011). Rural areas were marginalized from the general development projects and did not have access to infrastructure and services, which led to an increase in poverty rates. The liberalization programs transformed Arab countries into import-oriented and service-based economies that developed at the expense of agriculture and industry. The de-industrialization was held back due to the lack of good governance, which in turn was retarded by the lack of democracy (Springborg, 2011). According to Sika (2012, p.8), "the structural adjustment policies advocated by the World Bank and the IMF did not take into account the dynamics of authoritarianism in the region". Such authoritarian regimes were sustained by a system of cronyism, corruption, and clientelism that existed between the government and the private sector. The Arab states provided for the socio-economic needs of the business classes in return for their political domination. This has helped to sustain authoritarian regimes in the Arab world.

Social media has also helped in the contagious nature of revolutionary activity across the Arab states (Mortada & Salem, 2012; McGarty et al., 2013; Soengas, 2013; Tudoroiu, 2014). Conventional media and press were censored and controlled by governments. Individual freedoms were constrained (Khondker, 2011; Sika, 2012), and new media and the latest information technology gave people a new space of freedom to frame their grievances. Social network applications played a vital role in mobilizing

protesters (Acemoglu et al., 2014), building networks, organizing and publicizing social protests, and in presenting the uprisings and conflicts to the world (Khondker, 2011). However, social media was unable to create the social ties needed to take the steps that a revolution requires. It was only a tool of coordination and communication (Soengas, 2013). According to Tudoroiu (2014, p.15), despite all its importance, social media "would have been unable to bring social mobilization and political change in the absence of the structural socio-political causes of revolutions".

1.3. Empirical model and data

Our baseline empirical model is built upon that of Collier and Rohner (2008) regarding the choice of control variables, the method, and the estimation approach. The model is described as follows:

$$\text{Rev}_{i,t} = \alpha + \beta\ \text{SOCECO}_{i,t-1} + \gamma\ \text{POL}_{i,t-1} + \theta\ \text{MEDIA}_{i,t-1} + \delta\ \text{Governance PC}_{i,t-1} + \sigma\ \text{ICT PC}_{i,t-1} + \varepsilon_{i,t} \quad \textbf{(1)}$$

i= 1... 193; t= 1996 to 2015

Where i represents a country, and t represents a year. SOCECO is a vector of socio-economic variables; POL is a vector of political variables; MEDIA is an indicator of media censorship; Governance PC is the principal component of governance indicators; ICT PC is the principal component of Information and Communications Technology indicators; and $\varepsilon_{i,t}$ represents the error term. α, θ, δ and σ are parameters to be estimated, and β and γ are vectors of the parameters to be estimated.

1.3.1. Variables and data sources

The ***dependent variable*** is the revolution indicator. Many operationalizations of revolution were used in the literature. Some empirical studies refer to the Polity dataset to measure revolution. Mainly, they use the change in the composite Polity score (Maoz, 1989; Maoz, 1996; Enterline, 1998; Mansfield & Snyder, 2005) and durable variable (Smith, 2004; Morrison, 2009). Such specifications focus more on democratization rather than on revolution, and in many cases, they fail to separate the concept of the "democratic-ness" and the continuity of a regime (Colgan, 2012). Cartwright et al. (1985) considered revolutionary activity as anti-regime type wars fought within the territories of a country against the government in power to overthrow it. They excluded from their analysis the tribal wars and border wars. Such a definition is close to what (Marshall et al., 2017) considers as the "Revolutionary War". The latter is defined as "episodes of violent conflict between governments and politically organized groups (political

challengers) that seek to overthrow the central government, to replace its leaders, or to seize power in one region" (Marshall et al., 2017, p.5)

Others have used the Cross-National Time-Series Data Set compiled by Arthur Banks (Fearon & Laitin (2003); Collier Rohner (2008); Ponticelli & Voth (2011); Knusten (2014). The latter considers revolutions as "any illegal or forced change in the top governmental elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government" (Colgan, 2012, p.8). Such a definition includes events that are not accompanied by the transformation of the existing social, economic, and political relationships with the state.

Another dataset on revolutions, the Archigos, compiled by Goemans et al. (2016b) and used recently by Knusten (2014), considers successful revolutions as processes leading to a leader's exit from office, based on large-scale popular participation. We will refer to this dataset in this paper to identify successful revolutions that took place during the period under study (1996-2015).

Our dependent variable will, therefore, be 'successful revolutions', extracted from the Archigos dataset (Goemans et al., 2016b). This dummy variable takes the value 1 in any of the following cases: leader lost power as a result of domestic popular protest; leader removed by domestic rebel forces; leader removed by other government actors; or leader removed by the military without foreign support. Forty-seven cases of successful revolutions due to the irregular exit of the leader from office are observed.[1] However, Fiji witnessed two revolutions in the same year (2000), but since the dependent variable is a yearly one, only 46 successful revolutions will be counted (see Appendix A 1).

The right side of equation 1 includes the following: a vector of socio-economic (SOCECO) and political (POL) variables; governance (Governance PC); information and communications technology principal component (ICT PC); and, a media censorship (MEDIA) indicator. The lagged vector of socio-economic variables SOCECO considers proxies of economic performance, inequality, human development, educational attainment, and the importance of oil production. Regarding economic performance, the following variables are considered: the logarithm of real GDP per capita using constant 2010 US$ (*Log real GDP per capita*); the average real GDP growth rate over the last five years (*5-years average rate of real GDP growth*);[2] inflation rate *(Inflation %)*; and, the unemployment rate (*Unemployment %*). Data for

[1] We excluded irregular exit forms with foreign support.

[2] Real GDP per capita growth rate and real GDP growth rate were tested instead of 5-years average rate of real GDP growth rates, but they did not report any statistically significant results.

GDP inflation and unemployment is extracted from the World Development Indicators of the World Bank (World Bank, 2018). The *Gini index*[3] (extracted from Provcal Net of the World Bank) is used as a proxy for inequality. To measure human development, we use the *Human Development Index* (HDI) from the United Nations Development Programme (UNDP). The HDI considers achievements in three key dimensions: a long and healthy life, access to knowledge, and a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions during year *t-1* (UNDP, 2016). A high HDI indicates a high performance in the three aspects of human development. The level of educational attainment is proxied by the *% of school enrollment in primary education,* which is the cumulative percentage of the population over 25 years of age that has at least completed primary education. The data is extracted from the World Bank Development Indicators (World Bank, 2017a). The size of the population is proxied by *Log population*. A dummy variable to identify oil exporter countries is included (*Oil exporter*). This variable takes the value 1 if more than 33% of the country's exports are derived from oil, and 0 otherwise. An alternative measure is also used: *Fuel exports* is the percentage of oil exports of the total merchandise in year *t-1*. Data is extracted from the World Bank Development Indicators (World Bank, 2017a). Finally, the effect of globalization is captured by the revised version of the *KOF globalization index*, a composite index covering the economic, social, and political integration aspects which distinguish between *de facto* and *de jure* measures along the different dimensions of globalization (Gygli et al., 2019). *KOF de facto globalization* measures actual international flows and activities; *KOF de jure globalization* measures policies and conditions that, in principle, enable, facilitate and foster flows and activities. The overall KOF globalization index (KOF Global Index) combines *de facto* and *de jure* measures. The original version of KOF globalization index was first developed by Dreher (2006) and updated in Dreher et al. (2008). KOF globalization index was used to investigate the impact of globalization on ethnic violence (Bezemer & Jong-A-Pin, 2013), political stability (Bergh et al., 2014), terror attacks (Gassebner et al., 2011), among other factors.[4]

The risk of rebellion and revolutionary participation may be increased by: lower income growth (Breton & Breton, 1969; McGuire, 1981; Collier & Rohner, 2008; Knusten, 2014); high unemployment percentage (Ansani & Daniele, 2012); excessive inflation (Cartwright et al., 1985); high level of inequality (Acemoglu & Robinson, 2001); and, large population size (Collier & Hoeffler, 1998). As for education, the effect on the probability of revolution is ambiguous. While Lipset (1959) found that the occurrence of revolution is

[3] The Gini index measures the extent to which the distribution of income of a country i in year t-1 (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution.

[4] For a revision of the literature of papers using previous versions of KOF Globalization index see (Potrafke, 2015)

negatively correlated with the level of educational attainment, Huntington (1968) argued that, when people become more educated and urbanized as a result of economic development, they will demand greater political participation and more civil rights. If such popular demands are not addressed, discontent will surface, and political violence, including revolution, is possible.

The lagged vector of political variables (POL) includes two variables: the indicator of the regime type; and neighbors with violence. The indicator of the regime type refers mainly to the binary variable, *democracy,* which takes the value of 1 if the country is democratic (POLITY 2 score greater or equal to 6), and 0 if it is autocratic. Other indicators were used as alternative measures for the robustness check: Polity 2 is computed by subtracting the autocracy (AUTOC) score from the democracy (DEMOC) score; the resulting unified Polity scale ranges from +10 (strongly democratic) to -10 (strongly autocratic). In recent years, the Polity 2 variable has come under considerable criticism as it attributes similar scores in quite different situations (F. J. Veiga et al., 2017). A new six-fold classification of regimes was developed by Cheibub et al. (2010). They define democracy as regimes in which governmental offices are filled as a consequence of contested elections. The new six-fold classification variable, *DD,* takes the following values: 0 for parliamentary democracy, 1 for mixed (semi-presidential) democracy, 2 for presidential democracy, 3 for civilian dictatorship, 4 for military dictatorship, and 5 for royal dictatorship. The data is available up to 2008. We only consider a binary variable DD that takes the value 1 for parliamentary democracy, for mixed (semi-presidential) democracy, and for presidential democracy; and 0 for the remaining three cases. We expect less successful revolutions to occur in more democratic countries.

Another political variable was used: *Neighbors with violence.* It captures the possible impact of conflict in a neighboring state on the outbreak of revolution in a country *i.* The security of any state is affected not only by its conflict dynamics and outbreaks of Major Episodes of Political Violence (MEPV) but, also, by those in immediate proximity, mainly in neighboring states –– that is, states sharing a contiguous land or water border of two miles width or less (Marshall, 2017a). The variable *neighbors with violence* measures the number of bordering countries with any type of violence (societal or interstate). The dataset is extracted from the Center for Systemic Peace and covers the period 1996-2012.

Finally, the media indicator (media censorship) is the freedom of the press score calculated by Freedom House (*Freedom of the press*). Scores range from zero to 100 with 'free' going from 0-30, 'partially free' from 31-60, and 'not free' from 61-100. These scores are extracted from Freedom House (2017). We expect more successful revolutions to increase with more media censorship.

Governance PC[5] and *ICT PC* refer to the principal components of the indicators of the vectors of governance, and information and communications technology, respectively. A principal component analysis was conducted to find components that express maximum information from the above two categories of indicators. The eigenvectors displayed by the principal component analysis are returned in orthonormal form –– that is, uncorrelated and normalized.

Governance indicators include measures for: voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; the rule of law; and, corruption. These indicators are extracted from the Worldwide Governance Indicators of the World Bank (World Bank, 2017b), and they all range from approximately -2.5 (weak performance) to 2.5 (strong governance performance). The following indicators are considered:

- Political stability and absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.
- Government effectiveness reflects: perceptions of the quality of public services; the quality of the civil service and the degree of its independence from political pressures; the quality of policy formulation and implementation; and, the credibility of the government's commitment to such policies.
- Regulatory quality reflects: perceptions of the ability of the government to formulate and implement sound policies; and, regulations that permit and promote private sector development.
- Rule of law reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, in particular: the quality of contract enforcement; property rights; the police; and the courts; and, as well, the likelihood of crime and violence.
- Control of corruption reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests.

[5] PC refers to Principal Component

The indicators of the vector of information and communications technology include: fixed-broadband subscriptions; fixed telephone subscriptions; mobile cellular subscriptions; and, internet users for country *i* at year *t-1*. Data is extracted from the World Bank.[6]

Tables 1 and 2 include, respectively, the correlation between the two principal components and each of the variables.

Table 3 presents the descriptive statistics of the variables used in the empirical work.

[6] The term, 'fixed broadband subscriptions' refers to "fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. Fixed telephone subscriptions refers to "the sum of the active number of analogue-fixed telephone lines, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents and fixed public payphones" (World Bank, 2017a). Mobile cellular telephone subscriptions are "subscriptions to a public mobile telephone service that provide access to the PSTN using cellular technology. Internet users are individuals who have used the Internet (from any location) in the last 12 months (World Bank, 2017a).

Table 1 Correlation between the principal component of governance and each of the governance variables

	Voice and accountability	Political stability and absence of violence	Government effectiveness	Regulatory quality	Indicator of the agent's confidence and abidance by the rules	Indicator of control of corruption by the public authority
Principal component of governance	0.8749	0.8094	0.9568	0.9329	0.9779	0.9537

Source: Author's computations based on data extracted from the World Bank.

Table 2 Correlation between the principal component of ICT and ICT variables

	% Fixed broadband subscriptions	% Fixed telephone subscriptions	% Mobile subscriptions	% Individuals using the internet
Principal component ICT	0.8587	0.7913	0.7590	0.9548

Source: Author's computations based on data extracted from the World Bank.

Table 3 Descriptive statistics

VARIABLES	(1) N	(2) Mean	(3) Sd	(4) Min	(5) max
Dependent variable					
Successful revolution	3,860	0.0119	0.109	0	1
Socioeconomic variables					
Log real GDP per capita	3,650	3.638	0.657	2.064	5.159
5-years average rate of real GDP growth	3,728	0.0408	0.0448	-0.524	0.568
Unemployment %	2,034	0.0929	0.0611	0.0048	0.700
Inflation %	3,343	0.108	0.915	-0.181	41.45
Log population	3,857	6.693	0.937	3.965	9.135
KOF globalization index de facto	3,670	0.537	0.155	0.198	0.915
KOF globalization index de jure	3,750	0.585	0.164	0.174	0.923
KOF globalization index	3,670	0.562	0.154	0.214	0.907
Fuel exports	2,882	0.168	0.275	0	0.999
Oil exporter	2,886	0.176	0.381	0	1
% of school enrollment in primary education	2,245	0.878	0.144	0.218	1
Gini index	1,114	0.387	0.0948	0.162	0.658
Human development indicator	3,409	0.654	0.166	0.230	0.948
ICT indicators					
% of mobile subscriptions	3,785	0.470	0.479	0	2.078
% of fixed telephone subscriptions	3,782	0.186	0.196	0	1.327
% of fixed broad band subscriptions	2,255	0.0720	0.104	0	0.467
% of individuals using the internet	3,622	0.201	0.253	0	0.982
Governance indicators					
Voice and accountability index	3,075	-0.0463	1.008	-2.313	1.801
Political stability and absence of violence	3,027	-0.0480	0.998	-3.315	1.760
Government effectiveness	3,006	-0.0646	0.990	-2.446	2.437
Regulatory quality	3,007	-0.0778	0.986	-2.645	2.233
Indicator of the agents confidence	3,073	-0.0666	0.993	-2.606	2.100
Indicator of the control of corruption by the public authorities	3,015	-0.0655	0.998	-1.869	2.470
Media indicator					
Media censorship	3,770	0.467	0.245	0.0500	1
Political variables					
Polity 2 score	3,203	3.324	6.506	-10	10
Polity score	3,215	0.332	16.98	-88	10
Democracy	3,203	0.534	0.499	0	1
DD	2,645	0.574	0.495	0	1
Number of neighboring states with any type of political violence	2,765	0.781	1.064	0	7

Sources: (Cheibub et al., 2010; Goemans & Chiozza, 2016b; Marshall, 2017a, 2017b; Marshall et al., 2017; World Bank, 2017a; 2017b; 2018; Freedom House, 2017; Croicu & Sundberg, 2017; Gygli et al., 2019)

1.4. Methodology

Since our measure of revolution (*successful revolutions*) is dichotomous, taking the value of 0 or 1, linear regression methods are inappropriate. This is because estimates of a linear model are unbounded. They can produce predictions less than 0 or greater than 1. It is possible to estimate a model with a dichotomous dependent variable by OLS, by arbitrarily constraining predictions points to either 0 or 1. Still, the error term cannot satisfy the assumption of homoscedasticity. Furthermore, the residual will not be normally distributed. This implies that inference in small samples cannot be based on the usual suite of normality-based distributions such as the t-test (Greene, 2010).

To address the problems mentioned above, two nonlinear binary response models are commonly used in the literature: the logistic distribution, yielding the logit model, and the standard normal distribution, yielding the probit model. The logistic distribution is similar to the normal distribution except in the tails, which are heavier. Therefore, both can produce similar predicted probabilities except when the sample contains very few 1's or 0's, and when there is a very wide variation in an important independent variable (Greene, 2010).[7]

In his survey of qualitative response models, Amemiya (1981) noted that probit and logit models usually give similar results, and it is difficult to distinguish them statistically. He presented several scalar criteria such as the number of wrong predictions; the sum of squared residuals (SSR); SSR weighted by estimated probabilities; squared correlation coefficient; log-likelihood function; and, Akaike Information Criterion. Such criteria can be used to favor one model over the other. However, this question remains unresolved, and advice on how to choose is sparse (Greene, 2003).

Logit and probit methods are commonly used to study the onset of revolutions or other types of social unrest. Fearon and Laitin (2003) and Collier and Rohner (2008) used the logit method to study the onset of civil war. The probit method was used by Collier and Hoeffler (1998; 2005) and Collier (2000) to study the onset of civil wars and coups. Knusten (2014) studied revolutionary attempts with a panel fixed-effects logit method and a random-effects probit method, and successful revolutions with a panel random-effects logit method.

[7] Despite the fact that the sample contains considerably more zeros than ones, random-effects probit and logit methods generate similar results. For parsimonious reasons we only report the results for the random-effects probit method.

Since the majority of countries included in our dataset did not witness any successful revolution, the fixed-effects model will discard information from these countries. Therefore, we will refer to the random-effects probit model.

1.5. Empirical results

Table 4 shows the results of the baseline model: four socioeconomic variables (log real GDP per capita, 5-years average rate of real GDP growth, oil exporter, and log population); one political variable (democracy); and, the media censorship indicator. All variables are lagged one period. These variables were selected because they have been frequently used in previous studies of revolutions,[8] and they maximize the size of our sample (2,505) and the number of observations, where the dependent variable equals 1 (33 cases of successful revolutions).[9]

To test for a possible high correlation between two or more predictors, several multicollinearity diagnostic measures were applied (VIF, tolerance, eigenvalues, condition index, and R-squared).[10] The Mean Variance Inflation Factor (VIF) was 1.69, with the highest being equal to 2.84 less than the 'rule of thumb' 10, and the condition number[11] was 3.1996 for the baseline model, which falls within the accepted 'rule of thumb' range for concern.

The estimated coefficients of the RE probit model are expressed as odds ratios and are often difficult to interpret from a practical point of view. Usually, models with a binary dependent variable using probit regression report marginal effects instead of odds ratios. The marginal effects of an explanatory variable are calculated as the partial derivative of the dependent variable with respect to this explanatory variable. In the tables, we report the marginal effects at the sample mean. As for binary dependent variables where the derivative with respect to a small change might be inappropriate, the following marginal effect is used:

[8] 5-years average rate of real GDP growth will be used for the first time. Previous studies used average annual growth over 15, 20, and 25-year periods. Media censorship will also be used for the first time.

[9] Bangladesh (2007), Cameroon (1997), Central African Republic (2003 and 2013), Côte d'Ivoire (1999 and 2000), Ecuador (2000), Egypt (2011 and 2013), Fiji (2006), Gabon (1999, 2003 and 2009), Georgia (2003 and 2007), Guinea (2009), Honduras (2009), Kyrgyz Republic (2005 and 2010), Lebanon (2008), Madagascar (2002 and 2009), Mali (2012), Mauritania (2008), Niger (1996, 1999 and 2010), Pakistan (1996 and 1999), Thailand (2006 and 2014), Tunisia (2011), Turkey (1997)

[10] By using the Collin command of Stata and centering the data.

[11] Computed without a constant.

$$\Pr\left[\text{Re}\, v_{i,t} = 1 \middle| x_{dummyi,t} = 1, x^*_{i,t}\right] - \Pr\left[\text{Re}\, v_{i,t} = 1 \middle| x_{dummyi,t} = 0, x^*_{i,t}\right] \quad \textbf{(2)}$$

Where x_{dummy} denotes the dummy explanatory variable and x^* denotes the other covariates at their means.

Results reported in Table 4, columns 1 and 2, suggest that log real GDP per capita, 5-years average rate of real GDP growth, and media censorship are statistically significant. The analysis of the marginal effects shows that a one-unit increase in log real GDP per capita lowers the probability of successful revolutions by 0.840 percentage points. The result is statistically significant at 1% level of significance. A one percentage point increase in 5-years average rate of real GDP growth lowers the probability of successful revolutions by 0.0938 percentage points at 10% level of statistical significance. As for media censorship, the analysis of the marginal effects suggests that a one-point increase in media censorship increases the probability of successful revolutions by 3.12 percentage points. The result is statistically significant at 5% level of significance. However, no statistically significant results were found for oil exporter, log population or democracy.

Table 4 Baseline model: impact of economic development, level of income, oil, population, democracy, and media on successful revolutions

	(1)	(2)
VARIABLES	**Successful Revolutions**	
	Probit coefficients	**Marginal effects**
Log real GDP per capita	-0.473***	**-0.00840*** **
	(-2.768)	**(-2.724)**
5-years average rate of real GDP growth	-5.278*	**-0.0938***
	(-1.930)	**(-1.788)**
Oil exporter	-0.245	-0.00435
	(-0.734)	(-0.746)
Log population	-0.0516	-0.000917
	(-0.740)	(-0.711)
Democracy	0.222	0.00395
	(0.903)	(0.904)
Media censorship	1.753**	**0.0312** **
	(2.573)	**(2.403)**
Observations	2,505	2,505
Number of observations with dependent variable = 1	33	
Number of countries	151	

Table 4 (Continued)	
Log pseudo-likelihood	-155.60609
Pseudo R-Squared[12]	0.3393

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects. Column (1) reports the estimated coefficients and column (2) the marginal effects. All explanatory variables are one period lagged. The model includes a constant term. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0

Additional variables that may influence the success of a revolution were added successively to the baseline model in Table 5. The inclusion of these variables reduces the number of observations. The order of the variables included reflects the number of observations; that is, the first variables to be included are the ones that least reduce the number of observations. Columns 1 to 8 show the results for the human development index; inflation %; neighbors with violence; percentage of unemployment; percentage of school enrollment in primary education; Governance PC; ICT PC; and, the Gini index.

Regarding the governance indicators, only the first component was retained, since it alone explains 84.53% of the variation in the data. This also applies to the ICT indicators, where only the first component was retained. The latter explains 71.28% of the change in the data.

Only the marginal effects are reported in Table 5. The analysis shows that log real GDP per capita is statistically significant, and demonstrates the expected sign in five out of the eight regressions; it only loses its statistical significance when HDI, governance PC, and ICT PC are added. The loss of statistical significance of log real GDP per capita might be due to the high correlation that was detected with these explanatory variables (see Appendix A 4).

The 5-year average rate of real GDP growth maintains its statistical significance and the expected sign when the HDI and the inflation rate are added.[13] As for media censorship, it loses its statistical significance with the addition of Governance PC, unemployment %, % of school enrollment in primary education, and ICT PC. The new variables added did not show any statistical significance except for Governance PC and ICT PC. A one standard deviation increase in Governance PC[14] lowers the probability of successful revolutions by (0.423*2.252116=0.9526) 0.9256 percentage points. The result is statistically significant at 5% level of

[12] Calculated as: (LL constant-only model- LL full model)/ LL constant-only model

[13] Different measures of hyperinflation were used – inflation rate over 30%, 50%, 70% and 100%. However, none of these measures seems to have a statistically significant effect on the probability of successful revolutions (See Appendix A 5).

[14] Governance PC ranges from -5.804134 to 5.040494

significance. A one standard deviation increase in ICT PC[15] lowers the probability of successful revolutions by (0.283*1.68857=0.4778) 0.4778 percentage points. The result is statistically significant at 10% level of significance. Results also suggest that, when adding Governance PC and ICT PC, the dummy for oil exporter countries becomes marginally statistically significant. Being an oil exporter reduces the probability of successful revolutions by around 0.978 percentage points with Governance PC and 0.969 percentage points with ICT PC. It is important to stress that the number of observations in the regressions that include Governance PC and ICT PC (columns 3 and 7) is smaller than in the baseline model (2,035 and 1,620 respectively). The number of observations where the dependent variable (successful revolutions) is equal to 1 is also smaller (28 with Governance PC and 17 with ICT PC, respectively) than in the initial model (33).[16]

[15] ICT PC ranges from -2.240049 to 5.979356

[16] We noticed that, when adding Governance PC to the analysis, the following country/years with successful revolutions were excluded from the analysis: Côte d'Ivoire (2000), Ecuador (2000), Madagascar (2002), Niger (1996), and Pakistan (1996). And when adding the ICT PC variable, the following country/years with successful revolutions were excluded from the analysis: Bangladesh (2007), Cameroon (1997), Central African Republic (1999 and 2003), Guinea (2009), Honduras (2009), Madagascar (2002), Niger (1996, 1999), Pakistan (1996, 1999), and Turkey (1997).

Table 5 Model 1: adding new variables to the baseline model

VARIABLES	(1) HDI	(2) Inflation	(3) Neighbors with Violence	(4) Governance PC	(5) Unemp.	(6) Primary Education	(7) ICT PC	(8) GINI
Log real GDP per capita	-0.00171	-0.00877***	-0.00902**	0.000718	-0.00698**	-0.00712**	-0.000211	-0.00821*
	(-0.210)	(-2.888)	(-2.493)	(0.186)	(-1.989)	(-2.119)	(-0.0670)	(-1.890)
5-years average rate of real	-0.0976*	-0.105**	-0.0799	-0.0570	-0.00750	-0.0617	-0.0711	-0.0624
GDP growth	(-1.827)	(-1.980)	(-1.509)	(-1.097)	(-0.270)	(-1.132)	(-1.315)	(-1.341)
Oil exporter	-0.00493	-0.00383	-0.00270	-0.00978*	-0.00432	-0.00468	-0.00969*	-0.00316
	(-0.847)	(-0.678)	(-0.464)	(-1.850)	(-1.130)	(-0.899)	(-1.720)	(-0.584)
Log population	-0.00101	-0.000702	-0.00161	-0.00114	-0.000153	-0.000287	-0.00112	0.000913
	(-0.746)	(-0.584)	(-1.153)	(-0.960)	(-0.254)	(-0.307)	(-1.515)	(0.723)
Democracy	0.00435	0.00279	0.00543	-0.000485	0.00221	0.000568	-0.00266	2.91e-05
	(0.915)	(0.668)	(1.161)	(-0.127)	(0.733)	(0.175)	(-0.759)	(0.00807)
Media censorship	0.0327**	0.0291**	0.0336***	0.0110	0.0121	0.0134	0.0117	0.0252**
	(2.381)	(2.228)	(2.619)	(0.896)	(1.514)	(1.550)	(1.114)	(1.973)
HDI	-0.0284							
	(-1.006)							
Inflation %		-0.00230						
		(-0.282)						
Neighbors with violence			0.000582					
			(0.355)					
Governance PC				-0.00423**				
				(-2.340)				
Unemployment %					-0.0156			
					(-0.853)			
% of school enrollment in primary education						-0.000143		
						(-0.0170)		
ICT PC							-0.00283*	
							(-1.792)	

Table 5 (Continued)

VARIABLES	HDI	Inflation	Neighbors with Violence	Governance PC	Unemp.	Primary Education	ICT PC	GINI
GINI								0.000915
								(0.0630)
Observations	2,432	2,411	2,113	2,035	1,739	1,722	1,620	983
Observations with Dep.=1	33	32	29	28	15	17	17	14
Number of countries	148	146	149	151	97	140	144	130
Log pseudo likelihood	-153.34311	-148.78084	-140.76987	-128.78969	-71.999792	-82.61604	-79.491135	-62.173974
Pseudo R-squared	0.3489	0.3682	0.4023	0.4531	0.6942	0.6492	0.6624	0.7360

Note: Dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. The model includes a constant term. Only the marginal effects of the new variables added are reported in the table: column (1) with HDI, column (2) % inflation rate; column (3) neighboring countries with violence, column (4) Governance PC; column (5) % unemployment, column (6) % school enrollment in primary education, column (7) ICT PC, and column (8) Gini index. All variables are one period lagged. z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

To further explore the impact of governance on the occurrence of successful revolutions, we have estimated the baseline model with each of the world governance indicators used to compute the Governance PC one at a time. Results presented in Table 6 reveal that only two governance indicators are statistically significant, these being political stability and control of corruption (columns 2 and 6 respectively).

The statistical significance of the two governance variables indicates the necessity to include them in our analysis. We re-estimated the baseline model by including both the political stability and control of corruption variables (see column 7 of Table 6 below). The analysis of the marginal effects suggests that a one standard deviation increase in political stability decreases the probability of successful revolutions by (0.353*0.998=0.352) 0.352 percentage points. A one standard deviation increase in the control of corruption lowers the probability of successful revolutions by (0.602*0.998=0.60) 0.60 percentage points. Both results are statistically significant at 10% level of significance.

Table 6 Estimating the baseline model with each of the World Governance Indicators

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Successful Revolutions						
VARIABLES	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption	Control of corr. + political sta.
Log Real GDP per capita	-0.00515	-0.00267	-0.00110	-0.00662*	-0.00376	0.000754	0.00134
	(-1.517)	(-0.854)	(-0.249)	(-1.666)	(-1.026)	(0.245)	(0.435)
5 years average rate of Real	-0.0907	-0.0643	-0.0708	-0.0962	-0.0814	-0.0453	-0.0391
GDP growth	(-1.527)	(-1.187)	(-1.243)	(-1.511)	(-1.310)	(-1.123)	(-1.025)
Oil exporter	-0.00841	-0.00777	-0.00999*	-0.00817	-0.00877	-0.00882*	-0.00831*
	(-1.359)	(-1.436)	(-1.650)	(-1.242)	(-1.488)	(-1.909)	(-1.912)
Log Population	-0.00103	-0.00220	-0.000740	-0.00110	-0.00102	-0.000987	-0.00160
	(-0.755)	(-1.614)	(-0.585)	(-0.779)	(-0.761)	(-1.020)	(-1.643)
Democracy	0.00179	-0.00151	-0.000890	-0.000600	-0.000929	-0.00125	-0.00151
	(0.340)	(-0.376)	(-0.200)	(-0.121)	(-0.203)	(-0.384)	(-0.497)
Media Censorship	0.00944	0.0183	0.0219	0.0290*	0.0223	0.0128	0.0105
	(0.458)	(1.615)	(1.617)	(1.879)	(1.599)	(1.268)	(1.131)
Voice and accountability	-0.00727						
	(-1.195)						
Political stability		**-0.00629*** **					**-0.00353***
		(-2.679)					**(-1.794)**
Government Effectiveness			-0.00636				
			(-1.634)				
Regulatory quality				-0.00101			
				(-0.289)			
Rule of law					-0.00442		
					(-1.406)		
Control of Corruption						**-0.00830*** **	**-0.00602***

Table 6 (Continued)

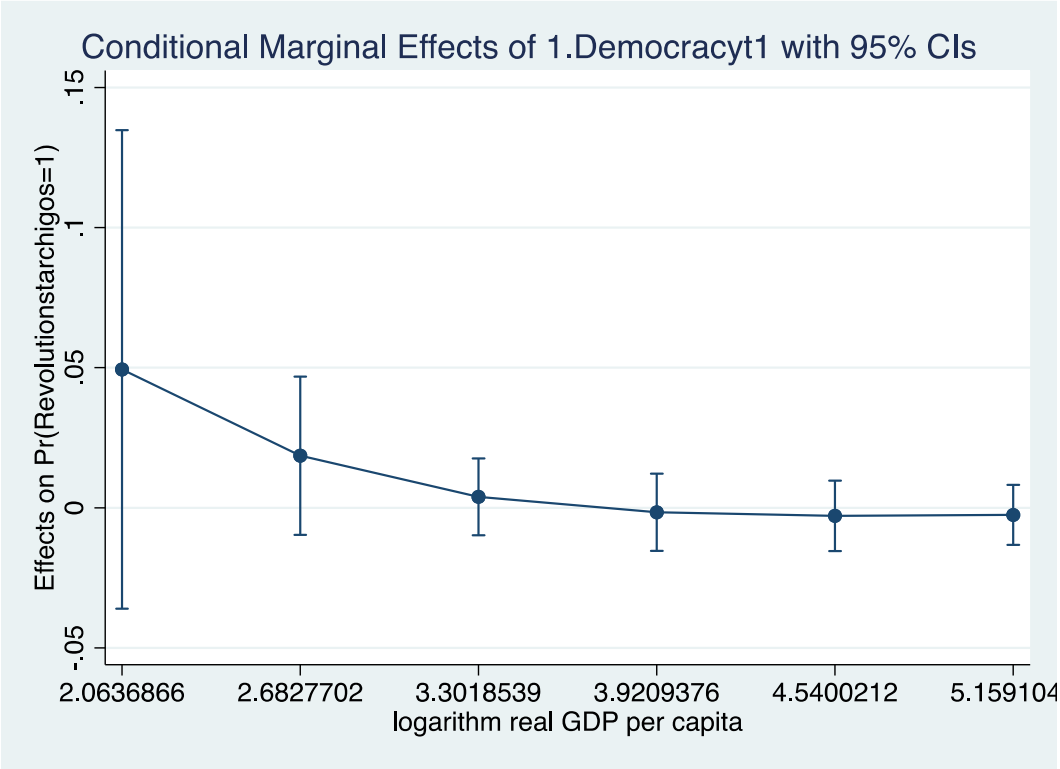
VARIABLES	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption	Control of corr. + political sta.
						(-2.643)	(-1.955)
Observations	2,036	2,036	2,035	2,036	2,036	2,036	2,036
Number of countries	151	151	151	151	151	151	151
Log pseudo-likelihood	-130.75764	-127.54503	-130.15517	-131.3124	-130.72695	-127.47214	-125.6876
Pseudo R-squared	0.4448	0.4584	0.4473	0.4424	0.4449	0.4587	0.4663

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects. Only marginal effects are reported. In column (1) we add voice and accountability to the baseline model, political stability in column (2), government effectiveness in column (3), regulatory quality in column (4), rule of law in column (5), control of corruption in column (6), and both political stability and control of corruption in column (7). All explanatory variables are one period lagged. The model includes a constant term. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1.

Results presented in Tables 4 and 5 did not show any impact of the regime type (measured by democracy) on the probability of successful revolutions. In contrast, the income level and the economic growth rate were statistically significant. Previous investigations in the literature tried to assess whether the effect of income level and growth on the probability of revolutions and other types of social unrest is contingent on the regime type. Collier and Rohner (2008) found that the direct effect of democracy and that of the interaction term (democracy and income level) are significant in explaining the incidence of rebellion, but with opposite signs. The direct effect is to increase the impact of rebellion. This is offset by a favorable interaction with income, creating a threshold level of income per capita at around USD 2,750, below which the net effect of democracy is to increase the incidence of rebellion. Knusten (2014) added to his study of revolutions an interactive term between the regime type (Polity) and income level (log real GDP per capita). His results suggested that higher income levels may reduce the probability of leaders being ousted through revolutions more in democracies than in dictatorships.

To test whether our model is consistent with the abovementioned findings in the literature, we added, in Table 7, a multiplicative term between *Democracy* and *Log real GDP per capita* (columns 1 and 2). The effect of the income level per capita on the probability of successful revolutions only seems to matter in the case of democracies, where it has a negative effect. The marginal effects analysis (at the bottom of the table) shows that log real GDP per capita is only statistically significant in democracies. This result is in accordance with Knusten (2014). However, contrary to Collier and Rohner (2008), we found no support for the hypothesis that the effect of democracy on the probability of revolutions is contingent on the level of income per capita. Figure 1 shows the conditional marginal effects of democracy.

Figure 1 Conditional marginal effects of democracy over log real GDP per capita



A similar analysis was conducted for the 5-year average rate of real GDP growth. Columns 3 and 4 of Table 7 show the estimation results of a regression, with an interaction term between *Democracy* and the *5-years average rate of real GDP growth.* The analysis of the marginal effects (at the end of the table) suggests that the impact of 5-years average rate of real GDP growth on the probability of successful revolutions only matters in non-democratic countries, where it has a negative effect. As can be seen from Figure 2, there is also evidence that the presence of democratic government reduces the probability of successful revolutions only for very low levels of the 5-years average rate of real GDP growth.

Figure 2 Conditional marginal effects of democracy over 5-years average rate of real GDP growth

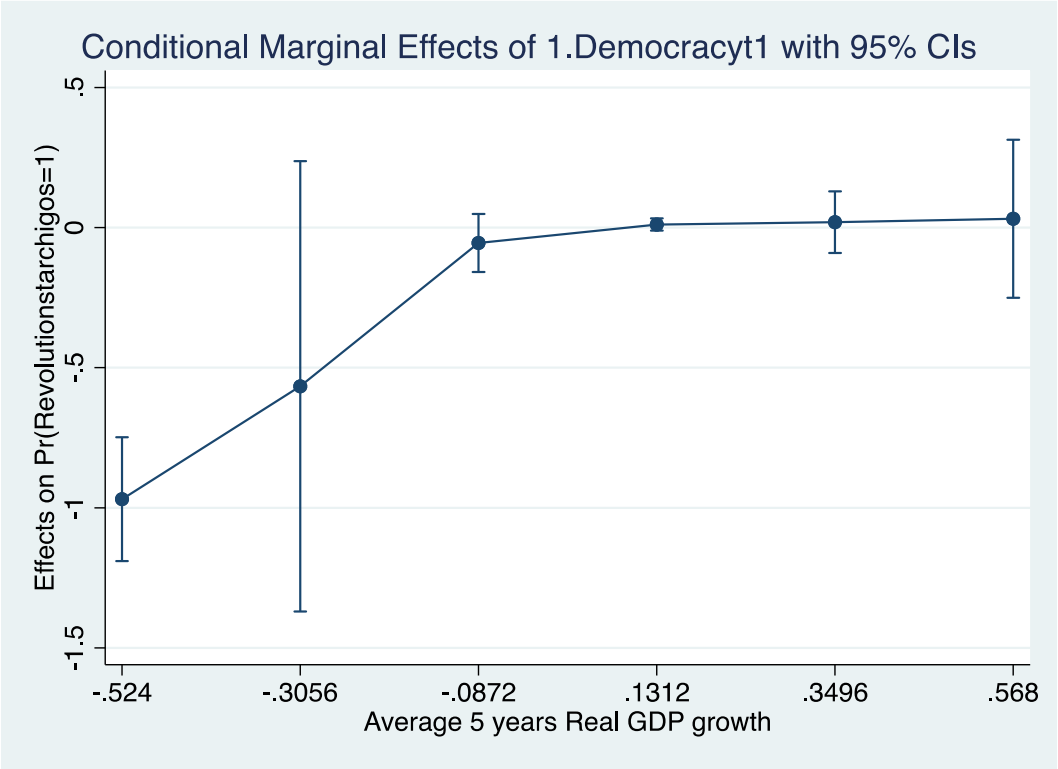


Table 7 Model 2: baseline model with an interaction term between democracy and log real GDP per capita, and democracy and 5-years average rate of real GDP growth

	(1)	(2)	(3)	(4)
	Interaction 1 - Democracy*log real GDP per capita		**Interaction 2 - Democracy * 5-years average rate of real GDP growth**	
VARIABLES	**Probit coefficients**	**Marginal effects**	**Probit coefficients**	**Marginal effects**
Log real GDP per capita	-0.246	-0.00928***	-0.444**	-0.00828**
	(-0.938)	(-2.751)	(-2.551)	(-2.561)
Average five years GDP growth	-5.840*	-0.102*	-8.702***	-0.0478
	(-1.954)	(-1.766)	(-2.728)	(-0.893)
Oil exporter	-0.312	-0.00578	-0.252	-0.00470
	(-0.960)	(-0.954)	(-0.769)	(-0.786)
Log population	-0.0405	-0.000750	-0.0363	-0.000677
	(-0.607)	(-0.598)	(-0.541)	(-0.531)
Democracy	1.482	-0.000365	-0.196	0.00349
	(1.229)	(-0.0518)	(-0.578)	(0.870)
Media censorship	1.518*	0.0281**	1.607**	0.0300**
	(1.955)	(1.971)	(2.483)	(2.420)
Democracy * log real GDP per capita	**-0.405**			
	(-1.017)			
Democracy* average five years GDP growth			**9.763***	
			(1.778)	
Observations	2,505	2,505	2,505	2,505
Number of countries	151		151	
Log pseudo-likelihood	-154.99871		-154.43435	
Pseudo R-squared	0.3418		0.3442	
Marginal effects of GDP over democracy				
Democracy=0		-0.00847		**-0.263****
		(-0.992)		**(-2.380)**
Democracy=1		**-0.00673*****		0.0129
		(-2.570)		(0.248)

Note: Dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. We include in column (1) the interactive term between democracy and log real GDP per capita. The marginal effect is reported in column (2). Column (3) includes an interactive term between democracy and 5-years average rate of real GDP growth and the marginal effects figure in column (4). The marginal effects of the interaction term are reported at the bottom of the table. All variables are lagged one period. The model includes a constant term. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

Earlier analysis in Table 5 showed interesting results when adding Governance PC and ICT PC separately to the baseline model. Therefore, in the following Table 8, we study first the direct impact of these two variables on the probability of successful revolutions when both are added to the baseline model, and then their indirect impact through adding a multiplicative term with the regime type (columns 2 and 3). Results reported in Table 8 show a statistical significance for oil exporter, Governance PC, and ICT PC. The analysis of the marginal effects suggests that being an oil exporting country reduces the probability of successful revolutions by 0.945 percentage points. As for the governance indicator, a one standard deviation increase in Governance PC reduces the likelihood of successful revolutions by (0.207*2.25116=0.4659) 0.4659 percentage points. The result is significant at 10% level of significance. The analysis of the marginal effects also suggests that a one standard deviation increase in ICT PC decreases the probability of successful revolutions by (0.226*1.68857=0.3816) 0.3816 percentage points. The result is significant at 10% level of significance. Regarding log real GDP per capita, 5-years average rate of real GDP growth, and media censorship, they are no longer statistically significant. It should be noted that the number of observations dropped to 1,549, with only 17 cases of successful revolutions.

In columns 2 and 3 of Table 8, we interact ICT PC with democracy and Governance PC with democracy, respectively. These two multiplicative terms enable us to check whether the impact on the probability of successful revolutions of more developed information and communications technology, and better governance, is contingent on the regime type. Nonetheless, the analysis of the marginal effects reported at the bottom of the table does not show any contingency of the regime type on the impact that both ICT PC and Governance PC can have on the probability of successful revolutions.

Table 8 Model 3: adding Governance PC and ICT PC and model 4: interacting ICT PC and Governance PC with democracy

VARIABLES	(1) Adding ICT PC and governance PC	(2) ICT PC*Democracy	(3) Governance PC*Democracy
Log real GDP per capita	0.429	0.438	0.429
	(1.023)	(1.063)	(1.026)
5-years average rate of real GDP	-5.757	-5.799	-5.901
growth	(-1.240)	(-1.224)	(-1.244)
Oil exporter	-1.223***	-1.247***	-1.218***
	(-2.735)	(-2.813)	(-2.717)
Log population	-0.118	-0.116	-0.115
	(-1.333)	(-1.308)	(-1.262)
Democracy	-0.253	-0.516	-0.317
	(-0.755)	(-1.089)	(-0.712)
Media censorship	0.480	0.420	0.435
	(0.490)	(0.436)	(0.413)
Governance PC	-0.267**	-0.260*	-0.239
	(-1.974)	(-1.908)	(-1.435)
ICT PC	-0.293**	-0.191	-0.289**
	(-2.086)	(-0.926)	(-1.979)
Democracy*ICT PC		-0.217	
		(-0.892)	
Democracy*Governance PC			-0.0571
			(-0.297)
Observations	1,549	1,549	1,549
Number of countries	144	144	144
Log pseudo likelihood	-77.207794	-76.896316	-77.179971
Pseudo R-Squared	0.6721	0.6735	0.6723
Marginal effects		**ICT PC over Democracy**	**Governance PC over Democracy**
Oil exporter	-0.00945*		
	(-1.800)		
Governance PC	-0.00207*		
	(-1.766)		
ICT PC	-0.00226*		
	(-1.768)		
Democracy =0		-0.00463	-0.00542
		(-0.959)	(-1.354)
Democracy =1		-0.00114	-0.00114
		(-1.162)	(-1.421)

Note: Dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. In column (1), we add governance PC and ICT PC to the baseline model. In column (2), we add an interaction term to the baseline model between ICT PC with democracy, and in column (3), we interact governance PC with democracy. The respective marginal effects are reported at the bottom of the table. All variables are lagged one period. The model includes a constant term. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

In the following Table 9, we investigate whether being an oil exporter impacts the probability of successful revolutions differently in democratic and non-democratic countries.[17] Ross (2001) and De Mesquita and Smith (2010) showed that oil has a particularly stabilizing effect in relatively autocratic regimes. Knusten (2014) found similar results for attempted revolutions but not for successful ones, and Collier and Rohner (2008) found that oil reduces the probability of guerrilla warfare but not revolutions. The results of our analysis with Model 1 (Table 5) suggest a stabilizing effect of oil in general. However, to test whether the impact of oil on the probability of successful revolutions is contingent on the regime type, we split the full sample into two sub-samples –– democratic and non-democratic countries. The results of the analysis with the two sub-samples are reported in Table 9. In the sub-sample of democratic countries (columns 1 and 2), the variable, oil exporter, has been omitted from the analysis, since there is no democracy with oil exporter equal to 1. As for the sub-sample of non-democratic countries, there is evidence of a pacifying effect of oil income. Being an oil exporting country reduces the probability of successful revolutions by 1.42 percentage points in non-democratic countries. The result is statistically significant at 10% level of significance.

[17] Recall that *Oil exporter* is a dummy variable that takes the value of 1if more than 33% of the country's exports are derived from oil and 0 otherwise.

Table 9 Model 5: oil impact in democracies and non-democracies

VARIABLES	Democratic countries		Non-democratic countries	
	(1) Democracy =1	(2) Marginal effects	(3) Democracy =0	(4) Marginal effects
Log real GDP per capita	0.372	0.000510	0.179	0.00226
	(0.356)	(0.376)	(0.351)	(0.335)
5-years average rate of real GDP	7.938	0.0109	-10.61**	-0.134
growth	(1.214)	(0.699)	(-2.304)	(-1.610)
Oil exporter	-	-	**-1.128****	**-0.0142***
			(-2.181)	**(-1.658)**
Log population	0.135	0.000185	-0.0780	-0.000985
	(0.780)	(0.483)	(-0.633)	(-0.667)
Media censorship	0.196	0.000269	0.865	0.0109
	(0.0568)	(0.0563)	(0.815)	(0.748)
Governance PC	-0.442	-0.000607	-0.299**	-0.00378*
	(-0.880)	(-0.793)	(-1.966)	(-1.740)
ICT PC	-0.428*	-0.000587	-0.220	-0.00278
	(-1.837)	(-1.029)	(-1.233)	(-1.150)
Observations	1,139	1,139	738	738
Number of countries	110		88	
Number of obs. with Dep.=1	6		11	
Log pseudo-likelihood	-29.110485		-47.210092	
Pseudo R-squared	0.680		0.6796	

Note: Dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. We restrict the analysis in column (1) to the sample of democratic countries and to the sample of non-democratic countries in column (3). The marginal effect is reported in column (2) and (4), respectively. The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

1.5.1. Globalization effect

In the following Table 10, we study the effect of the three KOF globalization indices on the probability of successful revolutions (KOF global index, KOF *de facto*, and KOF *de jure*). The analysis of the marginal effects shows that the impact of oil, ICT, and governance on the probability of successful revolutions is consistent throughout the different types of KOF indicators with the expected sign. However, the analysis of the marginal effects shows that KOF indicators do not have a statistically significant impact on the probability of successful revolutions.

Table 10 Model 6: impact of globalization on the probability of revolutions

	(1)	(2)	(3)	(4)	(5)	(6)
	KOF global		KOF de facto		KOF de jure	
VARIABLES	Probit coefficients	Marginal effects	Probit coefficients	Marginal effects	Probit coefficients	Marginal effects
Log real GDP per capita	0.125	0.000849	0.0361	0.000232	0.391	0.00300
	(0.324)	(0.320)	(0.0932)	(0.0937)	(0.886)	(0.798)
5-years average rate of real GDP growth	-5.423	-0.0370	-4.848	-0.0312	-5.772	-0.0442
	(-1.108)	(-0.896)	(-0.962)	(-0.835)	(-1.246)	(-1.005)
Oil exporter	-1.065***	-0.00726*	-1.011**	-0.00650*	-1.204***	-0.00922*
	(-2.644)	(-1.662)	(-2.402)	(-1.695)	(-2.795)	(-1.707)
Log population	-0.151	-0.00103*	-0.153*	-0.000984*	-0.123	-0.000944
	(-1.550)	(-1.891)	(-1.753)	(-2.019)	(-1.302)	(-1.725)
Democracy	-0.323	-0.00220	-0.252	-0.00162	-0.276	-0.00211
	(-0.957)	(-0.968)	(-0.804)	(-0.777)	(-0.682)	(-0.710)
Media censorship	0.299	0.00204	0.217	0.00140	0.459	0.00351
	(0.305)	(0.292)	(0.234)	(0.231)	(0.454)	(0.427)
Governance PC	-0.317**	-0.00216*	-0.320**	-0.00205*	-0.274*	-0.00210*
	(-2.135)	(-1.875)	(-2.365)	(-1.832)	(-1.807)	(-1.752)
ICT PC	-0.382**	-0.00260*	-0.364**	-0.00234*	-0.309**	-0.00237**
	(-2.550)	(-1.877)	(-2.365)	(-1.900)	(-2.157)	(-2.004)
KOF global	**3.071***	**0.0209**				
	(1.703)	**(1.487)**				
KOF *de facto*			**3.129****	**0.0201**		
			(2.336)	**(1.541)**		
KOF *de jure*					**0.472**	**0.00361**
					(0.212)	**(0.219)**
Observations	1,549	1,549	1,549	1,549	1,549	1,549
Number of countries	144		144		144	
Number of observations with Dep. =1	17		17		17	
Log pseudo-likelihood	-76.403342		-75.781992		-77.180829	
Pseudo R-squared	0.6755		0.6782		0.6722	

Note: Dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. The model includes a constant term. In columns (1) and (2), we use the KOF global index of globalization. In columns (3) and (4), we use the de facto measure. In columns (5) and (6), we used the de jure globalization measure. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

1.5.2. Robustness checks

Several robustness checks were conducted. First, we replaced the measure of the regime type, democracy, in the baseline model with Polity 2 (see Appendix A 6, column 1) and DD (column 3). The analysis of the marginal effects (column 2) shows that the log real GDP per capita, 5-years average rate of real GDP growth, and media censorship have results similar to those in the baseline model in terms of statistical significance

and coefficients. As for Polity 2, it also does not exhibit any statistically significant effect. Similar results were obtained when we used DD as a measure of democracy (column 4) except for 5-years average rate of real GDP growth, which appears not to have statistically significant effects.

Second, we replaced democracy in the interaction term of Table 7, model 2 with the dummy variable, DD. Results reported in Appendix A 7 show similar results to those reported in the baseline model. In both cases, the impact of log real GDP per capita on the probability of successful revolutions is only statistically significant in democracies.

Third, oil exporter was substituted with fuel exports in the baseline model and model 3. When replacing oil exporter with fuel exports in the baseline model (see Appendix A 8, column 2), similar results were obtained with similar coefficients and level of statistical significance. In both cases, the oil variable does not exhibit any statistically significant results. However, the oil variable, which reported statistically significant results in model 3, no longer displays any statistically significant results when replaced by fuel exports as a percentage of total merchandise (see Appendix A 8, column 4).

Fourth, democracy in Table 9, model 5 was substituted with Polity 2, DD, and Polity in Tables A 9, A 10, and A 11, respectively. These measures are used to distinguish between democratic and non-democratic countries. The analysis of the marginal effects suggests that, when using DD and Polity variables, oil has a pacifying effect in the sub-sample of non-democratic countries. Such a result was absent when using Polity 2.

Fifth, sensitivity checks were conducted by leaving out one control variable at a time from the baseline model. Oil exporter was first dropped (see Appendix A 12). The analysis of the marginal effects shows that log real GDP per capita, 5-years average rate of real GDP growth, and media censorship maintain their statistical significance, having similar coefficients as the baseline model. The same thing applies when dropping democracy (see Appendix A 14), log population (see Appendix A 17), and 5-years average rate of real GDP growth (see Appendix A 15). When dropping media censorship (see Appendix A 13), only log real GDP per capita is statistically significant with the expected negative sign. The analysis of the marginal effects in Appendix A 16 shows that after dropping log real GDP per capita, only media censorship appears to be statistically significant with the expected sign.

Sixth, we estimate our baseline model with two alternative methods to deal with the preponderance of zeros in our data: the Zero-Inflated Poisson model (ZIP) and the Zero-Inflated Negative Binomial model (ZINB). The ZIP model assumes that the excess zero counts come from a logit model and the remaining counts from a Poisson model. The model considers that with probability p the only possible observation is 0, and with probability 1 - p, a Poisson (λ) random variable is observed. Both probabilities are assumed to be linear functions of some covariates. The ZIP regression models are easy to fit and lead to more refined data analyses (Lambert, 1992). However, when the non-zero observations are over dispersed, the estimated parameters might be biased and the standard errors underestimated. The ZINB model better counts for these characteristics (Ridout et al., 2001). It is a natural extension of the negative binomial model to accommodate excess zeros in the data. It also allows dealing with over-dispersion (Yang et al., 2017). Although our dependent variable is binomial rather than count, we can still use these two alternative methods given that only one country in our sample witnessed more than one successful revolution.

In Appendix A 18, we report the results of the baseline model estimated with ZIP in column 1, ZINB in column 2 against the RE probit model in column 3. The analysis of the marginal effects of the ZIP and ZINB models shows that the results are similar to those of the RE probit model both in terms of the estimated coefficients and the statistical significance levels.

1.6. Revolutions in the Arab countries

The relatively recent social revolutions that broke out in some Arab countries have been attributed to socioeconomic factors such as: income inequality (Nimeh, 2012; Sika, 2012; Hlasny & Verme, 2013); increase in food prices (Ansani & Daniele, 2012); high unemployment levels, especially among the female youth (Sika, 2012); inefficient intervention and redistribution of the Arab economic systems (Malik & Awadallah, 2011); corruption and cronyism (Sika, 2012); and, social media (Mortada & Salem, 2012; McGarty et al., 2013; Soengas, 2013; Tudoroiu, 2014). These factors and others will be investigated in the following section. First, we apply the baseline model to the Arab countries. Results appear in Table 11. We also report the results of models 2, 3 and 7 in the same table, respectively: adding to the baseline model an interaction between democracy and log real GDP per capita and democracy and 5-years average rate of real GDP growth; adding Governance PC and ICT PC to the baseline model; and, adding an interaction between fuel exports and democracy to the baseline model. The oil exporter variable has been omitted from the

regression reported in Table 11. Second, we apply model 1, which consists of adding one new variable at a time. The phrase, 'Arab youth unemployment' has been used instead of 'percentage of unemployment'. Results are reported in Table 12. The analysis of the marginal effects does not report any statistically significant result for any of the above-mentioned models.[18]

Regarding the other variables added to the model, the principal component of governance (Governance PC) is statistically significant with the expected sign. The analysis of the marginal effects suggests that a one standard deviation increase in Governance PC decreases the probability of successful revolutions by (4.77*2.252116) 10.7 percentage points. The result is significant at 5% level of statistical significance. According to the results reported in column 5, media censorship exhibits statistically significant results when the variables neighbors with violence and ICT PC are added to the model.

[18] The variable, *democracy*, exhibits statistically significant results when adding HDI, ICT PC and percentage of school enrollment in primary education. However, these results are based on only one country considered as democratic.

Table 11 Arab countries

VARIABLES	(1) Baseline model	(2) Model 2	(3) Model 3	(4) Model 7
Log real GDP per capita	-0.00720	-0.00875	-0.0179	-2.96e-08
	(-0.000343)	(-0.000371)	(-0.000961)	(-6.14e-06)
5-years average rate of real GDP growth	1.331	1.196	1.203	2.57e-06
	(0.000606)	(0.000669)	(0.000914)	(0.00109)
Fuel exports				-2.17e-06
				(-0.00129)
Log population	0.0236	0.0221	0.0229	9.70e-08
	(0.000630)	(0.000697)	(0.000952)	(0.000876)
Democracy	0.0569	0.0614	0.0778	-0.00634
	(0.000615)	(0.000505)	(0.000758)	(-0.000793)
Media censorship	0.126	0.121	0.123	-1.49e-08
	(0.000609)	(0.000673)	(0.000919)	(-1.11e-05)
Observations	99	99	99	270
Number of countries	9	9	9	18
Log pseudo-likelihood	-18.223961	-18.212457	-18.176331	-21.054892
Pseudo R-squared	0.4832	0.4835	0.4846	0.4030
Marginal effects coefficients		**GDP per capita**	**5-years average...**	**Fuel exports**
Democracy=0		-0.0157	1.055	-0.0187
		(-0.000367)	(0.000918)	(-0.000957)
Democracy =1		0.0205	1.745	0
		(0.000663)	(0.000834)	

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. Only marginal effects are reported in the table. In column (1), we apply the baseline model to Arab countries. In column (2), we apply Model 2 with the interaction term between log real GDP per capita and democracy. In column (3), we apply Model 3 with an interaction term between 5-years average rate of real GDP growth and democracy, and in column (4), we apply Model 7 with an interaction term between fuel exports and democracy. The marginal effects of the interaction terms are reported at the bottom of the table. The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

Table 12 Model 1 applied to Arab countries

VARIABLES	(1) Arab. Youth Un.	(2) HDI	(3) Inflation	(4) Governance	(5) Neighbors with violence	(6) Education	(7) ICT PC
Log real GDP per capita	-0.0114	-0.141	-0.0752	0.0889	-0.0315	-0.183	-0.216
	(-0.129)	(-0.990)	(-0.0115)	(1.286)	(-0.436)	(-1.504)	(-1.315)
5-years average rate of real GDP growth	1.367	1.598	1.239	1.292	1.741	2.533	3.031
	(0.981)	(1.115)	(0.0112)	(0.928)	(0.943)	(1.275)	(1.460)
Log population	0.0228	0.0249	0.0261	0.0127	0.0145	0.0270	**0.0419***
	(1.252)	(1.597)	(0.0125)	(0.810)	(0.725)	(1.319)	**(1.746)**
Democracy	0.0587	**0.0836****		-0.0393	**0.0772****	**0.127*****	**0.177*****
	(1.399)	**(2.231)**		(-1.254)	**(2.335)**	**(2.674)**	**(2.787)**
Media censorship	0.106	0.163	0.208	0.114	**0.197*****	0.243	**0.528*****
	(0.630)	(1.287)	(0.0113)	(0.652)	**(2.692)**	(1.099)	**(3.510)**
Arab youth unemployment	0.0770						
	(0.241)						
Human development indicator		0.307					
		(0.857)					
Inflation %			-0.0931				
			(-0.0115)				
Governance PC				**-0.0477****			
				(-2.497)			
Neighbors with violence					-0.0154		
					(-0.778)		
% of school enrollment in primary education						0.258	
						(0.743)	
ICT PC							0.0116
							(0.271)
Observations	99	97	81	81	79	72	70
Number of countries	9	9	8	9	9	8	7
Number of obs. with dep=1	7	5	4	5	2	5	5
Log pseudo-likelihood	-18.19	-17.9	-14.72	-16.29	-14.3	-16.14	-16.12
Pseudo R-squared	0.4842	0.4924	0.5826	0.5381	0.5945	0.5423	0.5429

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit RE method. The model includes a constant. Only the marginal effects of the following variables are reported in the table: column (1) Arab youth unemployment; column (2) HDI; column (3) inflation; column (4) Governance PC; column (5) neighboring countries with violence; column (6) primary education; and column (7) ICT PC. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

1.7. Other forms of violent events

Other specifications of events of social unrest replaced the dependent variable in the baseline model –– that is, individual violent events against the government, successful coups d'état, attempted coups d'état, the total number of riots and demonstrations (in the Middle East, North Africa, Latin America, Sub-Saharian Africa, and East/South East Asia.), revolutionary war, and civil violence).

The total number of individual events of violence against the government of a country *i* during year *t* is defined as: "an incident where armed force was used by an organized actor against another organized actor, or against civilians, resulting in at least one direct death at a specific location and a specific date" (Croicu & Sundberg, 2017 p.2). We only considered cases where one party in the event is the government. Syria is excluded from the dataset. The analysis covers the period 1996 to 2015.

Successful coups d'état in a country *i* at year *t* is coded 1, when effective authority is exercised by a new executive for at least one month and 0 otherwise. Data is extracted from the Centre for Systemic Peace (Marshall, 2017a).

Attempted coups d'état in country *i* at year *t* are unsuccessful coups. Data is extracted from the Centre for Systemic Peace (Marshall, 2017a).

The variable, total number of riots and demonstrations in a country *i* at year *t* is extracted from the Urban Social Disorder (USD) event dataset of the Peace Research Institute, Oslo (PRIO). The scope of the USD dataset is to collect events that occur in select individual cities, not to represent the situation of entire countries. It contains information about urban unrest in 89 countries in the Middle East, North Africa, Latin America, Sub-Saharian Africa, and East/South East Asia.

The total number of riots includes the following:

- *Spontaneous violent riot*: distinct, continuous, and uncoordinated action resulting from an originally non-violent protest and directed toward members of a distinct 'other' group or government authorities.

- *Organized violent riot*: distinct, continuous, and coordinated action staged by members of a singular political or identity group and directed toward members of a distinct 'other' group or government authorities.

Regarding demonstrations, we considered the following:

- *Spontaneous demonstration:* distinct, continuous, and uncoordinated, largely peaceful action directed toward members of a distinct 'other' group or government authorities.

- *Organized demonstration*: distinct, continuous, and coordinated, largely peaceful action directed toward members of a distinct 'other" group or government authorities (Bahgat et al., 2017).

Revolutionary war is a binary variable taking the value 1 if the country *i* witnessed an outbreak of a revolutionary war at year *t*, and 0 otherwise. There are 20 cases of an outbreak of revolutionary war in our sample. It is calculated by the Center for Systemic Peace (see Appendix A 3 for description).

Civil violence is a binary variable that takes the value of 1 if there is an episode of civil violence during the year *t* in country *i*, and 0 denotes no episodes of civil violence. It is extracted from the Centre for Systemic Peace (Marshall, 2017a). There are 104 episodes of civil violence over the period 1996-2015 (see Appendix A 2 for description).

The descriptive statistics of the different forms of political instability and social unrest appear in Table 13 below.

On average, there are 0.00772 successful coups d'état, 0.0188 attempted coups d'état, 0.977 demonstrations and riots with some country/unit witnessing a maximum of 20 demonstrations and riots, 4.177 individual violent events against the government, with a maximum of 652 in some countries. As for revolutionary wars, there is an incidence of, on average, 0.00544 revolutionary war throughout the analysis.

Table 13 Descriptive statistics: other forms of violent events

VARIABLES	(1) N	(2) mean	(3) Sd	(4) Min	(5) max
Successful coups d'état	3,238	0.00772	0.0875	0	1
Attempted coups d'état	3,238	0.0188	0.145	0	2
Total number of demonstrations and riots	1,555	0.977	1.877	0	20
Individual events of violence against the government	3,659	4.177	30.13	0	652
Occurrence of episodes of civil violence	3,254	0.0292	0.168	0	1
Revolutionary war	3,860	0.00544	0.0736	0	1

Sources: Urdal & Hoelscher (2012); Sundberg & Melander (2013); Marshall (2017a); Bahgat et al. (2017); Croicu & Sundberg (2017).

Since the following variables –– successful coups d'état, the occurrence of episodes of civil violence and revolutionary war –– are binary variables, the panel probit random-effects method will be used as an estimation method. As for the total number of demonstrations of riots, attempted coups d'état, and individual events of violence against the government, standard linear regression is not an appropriate estimation method since the observed variable is a count number. It cannot take into account the constraint that the data and the model's predictions can only take non-negative integer values. The Poisson regression model has been widely used to study such data and to take into consideration the preponderance of zeros and the small values and discrete nature of the dependent variable. Poisson regression and its generalization, the negative binomial regression, are usually used in this case (Greene, 2003, 2010). Collier and Hoeffler (2005) used the Poisson formulation with the dependent variable being the number of coups plotted during the year. Ponticelli and Voth (2011) used the Poisson quasi-maximum likelihood estimation method with fixed-effects to examine what leads to social instability and protests. The dependent variable used is 'chaos', which is defined as the sum of the number of assassinations, demonstrations, riots, general strikes, and attempted revolutions. Panel Poisson estimation methods will be applied when using attempted coups d'état, the total number of demonstrations and riots, and individual events of violence against the government.

The results of the estimation of different forms of social unrest are reported in Table 14. In column 1, we estimate the baseline model with individual events of violence against the government as a dependent variable. The analysis of the results suggests that an increase in economic growth and being an oil exporter reduce the probability of such events against the government.

In column (2), we also estimated attempted coups d'état with the panel Poisson regression method. Results suggest that increases in real GDP per capita decrease the probability of attempted coups. The resulting

estimation of the total number of demonstrations and riots in column 3 suggests that increases in 5-years average rate of real GDP growth decrease the probability of demonstrations and riots. Oil has a pacifying effect since being an oil exporter reduces the probability of demonstrations and riots. Increases in the size of the population are associated with a higher probability of demonstrations and riots. These demonstrations appear to occur more in non-democratic countries since being a democracy reduces the probability of demonstrations and riots.

The remaining forms of social unrest (revolutionary war, the occurrence of episodes of civil violence, and successful coups d'état) were estimated using the panel probit method. The analysis of the marginal effects in column (4) suggests that increases in the 5-years average rate of real GDP growth reduce the probability of revolutionary war, and that increases in the size of the population increase the probability of revolutionary war. The analysis of the marginal effects in column 5 suggests that increases in the size of the population increase the probability of the occurrence of episodes of civil violence. An increase in the media censorship increases the probability of civil violence. As for successful coups d'état, the analysis of the marginal effects reported in column (6) suggests that increases in log real GDP per capita and the 5-years average rate of real GDP growth lower the probability of successful coups d'état.

Finally, we limited the model estimated in Table 14 to Arab countries only. The results are reported in Table 15 for the different forms of social unrest except attempted coups d'état where there were no such attempts in our sample. Only the population size seems to explain the violent events that occurred against the government in the Arab countries, where an increase in the size of the population increases the probability of violence against the government. As for the demonstrations and riots, the analysis of the results in column 2 suggests that increases in the 5-years average rate of real GDP growth decreases the probability of demonstrations and riots. Regarding the remaining forms of social unrest, the results reported in Table 15 do not show any statistically significant effect for any of the variables considered in our model.

Table 14 Baseline model: other forms of violent events

VARIABLES	(1) Violence against the Gov.	(2) Attempted Coups	(3) Demonstrations and Riots	(4) M. Effects rev. war	(5) M. Effects Civil Violence	(6) M. Effects Succ. Coups
Log real GDP per capita	0.821	-1.872**	1.462	-0.00142	-0.00394	-0.00509**
	(0.516)	(-2.519)	(0.625)	(-1.194)	(-0.606)	(-2.523)
5-years average rate of real	-8.989**	-15.73	-9.472**	-0.0435**	-0.0311	-0.0494*
GDP growth	(-2.375)	(-1.426)	(-2.124)	(-2.015)	(-0.516)	(-1.817)
Oil exporter	-0.754*	0.304	-0.823**	0.000440	-0.00602	
	(-1.862)	(0.192)	(-2.233)	(0.353)	(-0.831)	
Log population	0.818	-0.146	0.419***	0.000955**	0.00932*	0.000357
	(1.315)	(-0.887)	(3.142)	(2.334)	(1.739)	(0.585)
Democracy	0.294	0.0350	-0.318*	-0.00155	0.000786	-0.000122
	(0.670)	(0.0290)	(-1.894)	(-1.601)	(0.111)	(-0.0427)
Media censorship	-2.927	0.609	1.047	0.00266	0.0595*	0.00841
	(-1.316)	(0.380)	(1.278)	(0.891)	(1.819)	(1.028)
Observations	2,501	2,495	1,204	2,505	2,503	2,051
Number of countries	146	151	74	151	151	131
Log pseudo-likelihood	-6228.0886	-126.46987	-1740.3648	-65.178568	-151.83728	-74.732418
Pseudo R-squared	0.4441	0.5643	0.2189	0.4929	0.3242	0.4759

Note: The count dependent variables used in columns (1), (2), and (3) are respectively: Occurrence of violence events against the government, attempted coups d'état, and total number of demonstrations and riots. They are estimated by panel Poisson random-effects method. The dependent variable in column (4) is binary variable revolutionary war, in column (6) civil violence, and column (8) successful coups d'état. They are estimated by panel probit random-effects method. Only the respective marginal effects are reported. All models include a constant term. All variables are lagged one period. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

Table 15 Baseline model: other forms of violent events in the Arab countries

VARIABLES	(1) Violence against the Gov.	(2) Demonstrations and Riots	(3) Rev. War	(4) M. Effects rev. war	(5) Civil Violence	(6) M. Effects Civil Violence	(7) Successful coups	(8) M. Effects Succ. Coups
Log real GDP per capita	-11.89	6.714	-1.621***	-0.00110	0.0347	0.000249	-2.507	-0.0355
	(-1.096)	(0.693)	(-2.985)	(-0.749)	(0.0210)	(0.0205)	(-1.642)	(-0.861)
5-years average rate of real GDP growth	4.224	**-37.70*** **	-32.42***	-0.0221	-5.805**	-0.0417	30.98	0.439
	(1.308)	**(-2.917)**	(-5.224)	(-0.702)	(-2.413)	(-0.749)	(0.761)	(1.233)
Oil exporter	0.169	-0.687	-0.0390	-2.65e-05	-0.718	-0.00515		
	(0.185)	(-0.834)	(-0.0633)	(-0.0633)	(-1.021)	(-1.003)		
Log population	**15.23*** **	1.730	0.453***	0.000308	1.550**	0.0111	0.479***	0.00678
	(2.975)	(1.340)	(3.776)	(0.743)	(2.568)	(0.834)	(3.027)	(0.741)
Democracy	-0.361	-2.481						
	(-0.875)	(-0.370)						
Media censorship	2.629	-2.348	-0.690	-0.000470	4.650	0.0334	-4.175*	-0.0591
	(0.860)	(-1.287)	(-0.506)	(-0.416)	(1.243)	(1.080)	(-1.835)	(-0.753)
Observations	269	183	252	252	250	250	82	82
Number of countries	18	12	17	17	17	17	8	8
Log pseudo-likelihood	-925.48799	- 263.6642	-13.585382		-39.403737		-7.6348737	
Pseudo R-squared	0.7228	0.3929	0.522		0.1678		0.6533	

Note: The count dependent variables are used in columns (1) and (2) are: Occurrence of violence events against the government, and total number of demonstrations and riots. They are estimated by panel Poisson random-effects method. The dependent variable in column (3) is binary variable revolutionary war, in column (5) civil violence, and column (7) successful coups d'état. They are estimated by panel probit random-effects method with the respective marginal effects in columns (4), (6), and (8). Estimations include a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

1.8. Conclusion

Over the period 1996-2015, the world witnessed the outbreak of 47 successful revolutions (Archigos dataset). Previous studies focused on economic and political factors, mainly the regime type, to explain the reasons behind the outbreak of such an event.

In this chapter, we shed light on other potential determinants of successful revolutions. Besides log real GDP per capita, where its increase lowers the probability of successful revolutions, 5-years average rate of real GDP growth was used for the first time to study successful revolutions. Other factors were considered in the baseline model: the size of the population, an indicator of oil production, media censorship, and an indicator of the regime type. Although the literature found that in more democratic countries, there is a lower probability of revolutions; however, the regime type did not exhibit any statistically significant effect on the likelihood of successful revolutions. This result was consistent when using the different available measures of the regime type (DD, Polity 2, and Polity). However, when interacted with democracy, we found that log real GDP per capita reduces the probability of successful revolutions only in democratic countries, and the effect of 5-years average rate of real GDP growth on the probability of successful revolutions matters only in non-democratic countries.

Another statistically significant variable considered in our baseline model is media censorship. This variable was never used previously to study neither the onset nor the success of revolutions. Our results suggest that an increase in media censorship increases the probability of successful revolutions. Stronger censorship in a country witnessing social unrest might result in higher levels of violence ultimately increasing the probability that such violence turns out to be a successful revolution. This conclusion is in line with the findings of Casilli & Tubaro (2012, p. 14) on social media censorship. The authors argue that "in the absence of robust indicators as to the rebelliousness of a given society, the choice of not restricting social communication turns out to be a judicious one for avoiding to trade democratic values and freedom of expression for an illusory sense of security". In the absence of censorship, agents express freely and peacefully their discontent about their governments' policies. The stronger the censorship, the more violent the protests are, and the higher is the probability of a successful revolution.

Other variables were added to the baseline model: Only Governance PC and ICT PC reported statistically significant results, where an increase in either of these two variables lowers the probability of successful

revolutions. Similar results were obtained when we replaced Governance PC with political stability and control of corruption. It is only recently, with the outbreak of the Arab spring, that research has started to focus on the importance of governance and the development of media and communication technologies in explaining the onset of revolutions. However, our results showed that these two factors played a role in explaining the success of revolutions occurring many years before the Arab spring. Good governance assures macroeconomic stability and security of person and property rights (Springborg, 2011). Inadequate governance inhibits industrialization and threatens to the country's economic well-being which raises people's discontent leading them to resort to political violence. As for ICT, they facilitate the spread of information and the freedom of expression. Their effect on the probability of successful revolutions corroborates with that of media censorship. With more advanced ICT, people do not need to resort to violence in order to frame their grievances.

We also noted that when adding these two variables to the baseline model, oil starts to exhibit statistically significant results, particularly in non-democratic countries. Such a pacifying effect was absent in previous studies of successful revolutions.

Our baseline model was robust in explaining the successful revolutions that occurred in our sample over the period 1996-2015; this, however, was not the case when we restricted our analysis to the Arab countries.

In this paper, we reevaluated the triggers previously advanced in explaining the causation of successful revolutions –– mainly income level, the size of the population, oil, and the conditional effect that democracy can have on the probability of successful revolutions. Our main contribution to knowledge in this domain consists of introducing and exploring new factors such as media censorship, governance, and ICT into the analysis. These factors proved to have a statistically significant effect in most of the regressions that we conducted.

The main limitation of this study is related to the time frame considered for our analysis, which reduced the number of successful revolutions. However, considering a more extended period would not have allowed us to study many of the new factors included in this paper. Another limitation was the missing data for several variables, which reduced the number of observations.

CHAPTER 2: VOTING IN A MUTLI-CONFESSIONAL MULTI-PARTY SYSTEM: THE POWER OF ECONOMICS

Abstract

The purpose of this paper is to estimate the effects of religious, socio-economic, and political factors on party choice in Lebanon. In this multi-confessional, diverse, and pluralistic country, it is not a surprise to find statistically significant results of the religious factors. Nevertheless, the economy is still a significant predictor of political parties' vote shares. Districts with high levels of income vote more for Hezbollah and Future Movement, and less for Independents. An increase in the unemployment rate penalizes the Syrian Social Nationalist Party. Independents benefit when the number of independent ministers is large. Moreover, as expected, bombings and assassinations have a significant impact. Independent candidates are penalized in districts that witness more bombings and assassinations during election years.

Keywords: Economic voting; Income; Religion; Unemployment; Time in office.

2.1. Introduction

The literature on economic voting behavior is extensive and consistently finds that economic factors, particularly unemployment and inflation, impact on electoral results, and voting behavior.[19] The relevance of party identification in voters' behavior is also well established in the literature (Campbell et al., 1960). Moreover, it has been demonstrated that the social profiles of political candidates, namely their religious affiliation, significantly affect levels of partisan voting (Campbell, Green, & Layman, 2011). However, most of the existing literature focuses on Western democracies, where consolidated democracies with secular states prevail. Analyses of Arabic countries, where religion polarizes society, and violent events are frequent, are very scarce. This paper intends to contribute to filling this gap in the literature by analyzing the factors that shape the voting behavior of Lebanese citizens, based on the parliamentary elections of 1996, 2000, 2005, and 2009. Using data for the 26 administrative districts, we investigate which variables influence parties'

[19] See Lewis-Beck & Stegmaier (2019) for a recent survey on economic voting.

vote shares at the district level. Our variables range from political to economic and social factors, including religion.

With more than 18 religious sects and more than 30 political parties, we raise the question as to whether religion is the main determinant of Lebanese voters' choice. Additionally, the impact of economic performance on incumbents' electoral results is also a question worthy of investigation. To the best of our knowledge, these questions remain unanswered. In this paper, we present a quantitative analysis, based on econometric estimations, of the factors underlying Lebanese voters' choice in parliamentary elections.

The paper is organized as follows: Section 2.2 reviews the literature on voting and popularity functions. Section 2.3 briefly presents the political and electoral context of Lebanon. Section 2.4 explains the empirical model and describes the data. Section 2.5 displays and discusses the empirical results. Finally, Section 2.6 concludes our investigation.

2.2. Literature review

The responsibility hypothesis of Downs (1957) is the theoretical starting point of the literature on economic voting. The basic idea is that voters hold the government accountable for the evolution of the economy: They support the government when the economy is doing well and, otherwise, vote for the opposition. Many empirical studies found supportive evidence for this hypothesis (Lewis-Beck & Stegmaier, 2013, 2019).

Most of the early national-level studies analyzed the relationship between macroeconomic variables and election outcomes in the United Kingdom (Goodhart & Bhansali, 1970; Frey & Schneider, 1978b; Pissarides, 1980) and the United States (Kramer, 1971; Goodman & Kramer, 1975; Tufte, 1975, 1978; Hibbs, 1982). Results confirmed that voters' behavior responds to the macroeconomic conditions, particularly to inflation and unemployment.[20] Similar results were obtained by studies focusing on other countries.[21]

[20] For more recent studies about the UK and the USA see, among others Kiewiet & Udell (1998), Lewis-Beck & Rice (1992), Hodgson & Maloney (2012) and Lewis-Beck et al., (2013).

[21] Among others, see for Australia Schneider & Pommerehne (1980); for Denmark Madsen (1980), Paldam & Schneider (1980); for France Lafay (1985), Rosa & Amson (1976) and Rosa (1980); for Japan Inoguchi (1980); for New Zealand Ursprung (1983); for Norway Madsen (1980); for Portugal Veiga (1998) and Veiga & Veiga (2004), and for Sweden Jonung & Wadensjoe (1979).

The enlargement of the number of countries inspected increased the diversity of political and institutional settings, allowing for a refinement of how voters assess governments' competence based on the countries' economic performance. Stronger empirical support for the responsibility hypothesis is found in countries with a two-party system than in multi-party system countries (Paldam & Schneider, 1980; Sorensen, 1987; Belluci, 1991; Anderson, 1995). Additionally, single-party governments are held more accountable for the evolution of the economy, and the simpler the governing coalition, the larger is economic voting (Lewis-Beck, 1988). There is also evidence that the extent to which coalition governments benefit from positive economic outcomes depends on which parties form the coalition since voters evaluate parties based on their preferred policies (Swank & Eisinga, 1999).

Naturally, voters' economic perceptions are not the only determinants of voting behavior. Other factors, such as party identification (Campbell et al., 1960), explain the support for parties over several elections (Sanders, 2003). Party identification, or partisanship, refers to the psychological attachment to a party that enables citizens to define themselves and others in the political landscape (Campbell et al., 1986). Some consider party identification as a summary evaluation of the parties' orientations, vis-à-vis issues, and ideologies (Downs, 1957b; Abramowitz & Saunders, 2006), where voters favor the party having ideological and policy positions closer to their own policy beliefs (Sanders, 2003). Partisan voting is higher when candidates emphasize traditional partisan issues (Miller et al., 1976; Miller, 1978) and when ideological differences between parties and candidates are stronger (Bartels, 2000; Highton, 2010). As long as voters keep voting for the same party, voters tend to become party identifiers (Sanders, 2003). Partisanship is a rational behavior that reduces the cost paid by individual voters to collect continuous information on other parties' ideologies and policies (Downs, 1957). It can also be interpreted as a result of a cumulative evaluation of major parties, where the voter identifies himself with the party that out-performed its rivals over time (Fiorina, 1981). Another view of party identification (Green et al., 2002) draws a close connection between parties and social identities (social class, ethnicity, race, and religion). The candidate's social profile plays an important role in shaping partisan voting (Miller et al., 1991), where differences in candidates' social identities cause differences in partisan voting (Campbell et al., 2011). The impact of partisanship on elections, especially within the US context, was always relevant (Campbell et al., 1960). However, the level of partisan voting has fluctuated over time (Bartels, 2000; Weinschenk, 2013) and across types of elections (Bartels, 2000).

The religious orientation of the candidate – one of the candidate's social traits – might have a direct effect on voting behavior, as voters tend to choose a candidate from their faith (Kane, Craig, & Kenneth, 2004; Botterman & Hooghe, 2009; Campbell et al., 2011). Voters can also infer traits, beliefs, partisanship, policy or ideological viewpoints from the candidate's religious affiliation. Different religious groups have different opinions and concerns regarding socio-economic, environmental, political, and other issues. This can lead to a variety of conclusions regarding voting behavior (Gibbs, 2005). For instance, Evangelical protestants, Mormons, and Christian fundamentalists are connected to traditional morality and, therefore, vote more conservatively; while Jews and Catholics, people of faiths more connected with liberalism, vote more liberally (Gibbs, 2005; Campbell et al., 2011). In the US, even among Evangelicals, partisan voting differs between African-American Evangelicals and White Evangelicals. African-American Evangelicals, who preach more in their churches about civil rights and the economy, vote more Democratic than White Evangelicals (Lockerbie, 2013). Note, however, that the evidence regarding Catholicism is mixed. Studies on the influence of social group identities on attitudes and voting in the U.S., Canada, and Britain found that Protestantism is associated with conservatism and that Protestants are more likely to vote for right-wing parties, but that, in general, Catholicism appears to have little influence on voting patterns (Andersen & Heath, 2003; Campbell et al., 2011).

Scholars have long been interested in analyzing the political economy of voting within the context of developed countries, with consolidated democracies and secular states, especially the U.S. and Western European countries. Fewer empirical investigations have been conducted in developing countries, and even less in Arab countries (Posusney, 2002; Lust-Okar, 2006; Blaydes, 2006, 2011; Gharaibeh, 2007; Blaydes & Tarouty, 2009; Sadiki, 2011; Pellicer & Wegner, 2014; Elsayyad & Hanafy, 2014; Ozen, 2017).

Studies on voting behavior in Lebanon are very scarce (Harik, 1980; Hourani & Sensenig-Dabbous, 2012; Lebanese Association for Democratic Elections, 2014). They show that political and religious factors are very important in voter's choice. According to Harik (1980), kinship ties, patronage, partisanship, political orientation, and personal likes and dislikes of candidates were the basis of voter support in the elections that took place between 1943 and 1974. The results of this empirical study show that confessionalism, education, and exposure to media explain differences in voters' political attitudes. In a study of the voting patterns of naturalized citizens, Hourani and Sensenig-Dabbous (2012) found that voting behavior is affected first by sectarian affiliation and second by intra-sectarian political rivalries. The authors argued that neither economic,

cultural, nor institutional barriers affect voting behavior. An opinion poll was conducted in 2014 by the Consortium for Civil Advocacy and Mobilization for Electoral Reform, led by the Lebanese Association for Democratic Elections (LADE), to better understand the criteria for choosing a candidate. Empirical results indicate that the most important criteria for choosing a candidate are the latter's educational level and ability to provide development services to the electoral district (Lebanese Association for Democratic Elections, 2014).

2.3. Overview of the political and electoral systems in Lebanon

This section presents an overview of the Lebanese political system, electoral laws and electoral results.

2.3.1. Political system

Lebanon is a democratic republic placed under French control by the League of Nations at the end of World War I. Before this, the region was occupied by the Ottoman Empire for about 400 years. At the end of the 18th century, Muslim communities – Sunni and Druze in particular – had a better social status and participation in the power structure than Christian and Shiite communities. This balance of power changed during the first half of the 19th century, especially in the Mount Lebanon Governorate. Of the many reasons for this, the expansion of European and American sanctuary and educational systems that affected mainly Christian communities are seen as especially significant (Labaki, 1988).

At the end of World War I, the Ottoman Empire was dissolved, and France was entrusted with the mandate over Lebanon and Syria. In 1920, France created the state of Greater Lebanon in consultation with the Christian community (Salibi, 1988). In 1922, a local representative council was set to draw up the Lebanese constitution under French supervision. The constitution (declared in 1926) defined the identity and political system of Lebanon as a sectarian system where citizens are grouped according to different religious affiliations and confessions. Religion was the primary determinant of representation in the political, educational, and social organization of the country (Rabil, 2011). This political system was initially envisaged by Maronite Christians, who were politically controlling the Lebanese system (Salibi, 1988).

After Lebanon gained its independence in 1943, a consensus (National Pact) on how to share power and redistribute wealth was adopted by the different confessional communities of the country. According to the unwritten 1943 National Pact, the President of the Republic should be a Christian Maronite, the Prime

Minister a Sunni Muslim, and the Speaker of the Parliament, a Shiite Muslim. Parliamentary seats were distributed according to sect and region, ensuring the Christians a majority of seats. The advantage accorded to Christians appeared as well within the government and bureaucracy; Christians were better off than the Sunnis, who were, in their turn, better off than the Shiites (Youngblood-Coleman, 2016).

Today, each confessional community in Lebanon controls its judiciary and educational system. They have relations with foreign states and political organizations motivated by religious, political, as well as social factors (Labaki, 1988). Muslims usually want close relations with the Arab world, while Christians prefer to maintain close relations with the West (Nedelcu, 2014). The influence of confessions is directly observable in political parties that emerge in general from specific religious communities (Labaki, 1988). Each has its ideology and vision with regards to the Lebanon they envisage and the political system they prefer, to the point that Corm (2012) considered that there are as many 'Lebanons' as there are politically active religious communities in Lebanon.

From 1975 till 1991, Lebanon suffered a bloody civil war triggered by social grievance and hostilities between Christians and Muslims (Nedelcu, 2014). Lebanese Christians were controlling the state and aiming at preserving their sovereignty and independence from the Arab world, which was dominated by Islamic-colored pan-Arabism. On the other hand, the fears of Lebanese Christians were underestimated, even though Lebanese Muslims understood the peculiar position occupied by the Christians. They had grievances against the political system controlled by Christians and cooperated with the pan-Arab platform. The latter called for the unity of the Arab World. It often interfered in Lebanese affairs and played a role in destabilizing the country (Salibi, 1988). This Christian-Muslim conflict lies at the root of the Lebanese civil war that drew in regional powers, particularly Israel, Syria, and the Palestine Liberation Organization (PLO). Shortly after the war started, Syrian troops moved in. Israeli troops invaded in 1978 and again in 1982 before withdrawing in May 2000 (Youngblood-Coleman, 2016).

The opposed Lebanese parties who were taking part in the civil war signed the National Accord document in Taif, Saudi Arabia, on 24 October 1989. The national assembly approved amendments of the Taif agreement in August 1990. These included the transfer of presidential powers to the council of ministers and the expansion of the number of seats in the parliament from 99 to 108, equally divided between Christians and Muslims (Hudson, 1999). By this agreement, the President of the Republic remains a Christian Maronite, but

with substantially reduced power. The Prime Minister remains a Muslim Sunni with the increased power of the council of ministers, which he chairs. The President of the Chamber of Deputies is granted to a Muslim Shiite with a four-year term and more influence (Hudson, 1999). Taif became a kind of recognition of the Lebanese political system. It reexamined each sect's role and established a new *modus vivendi*, providing the basis for new cooperation between different confessions (Nedelcu, 2014); at the institutional level, the Lebanese political system was characterized as a consociational democracy (Horn, 2008). The agreement also called for gradual phasing out of political sectarianism. However, the postwar period witnessed more sectarianization of electoral contests that reinforced the political control of sectarian elites (Salloukh et al., 2015).

2.3.2. Electoral laws and elections

2.3.2.1. Electoral laws

Lebanese citizens elect their representatives in parliament and local councils (municipalities and Mukhtars) by direct ballot, while the parliament elects the President of the Republic and provides a vote of confidence in the government (The Lebanese Constitution, 1995).

The members of the Chamber of Deputies are elected according to the electoral law in effect. As long as the chamber does not enact new electoral laws based on non-confessional principles, the seats shall be distributed equally between Christian and Muslim communities, proportionally among the confessional groups within each of the two religious communities — seven Christian and four Islamic (see Table 16), and proportionally among geographic regions (see Table 17). Such an arrangement or quota system, where each community is assigned a fixed share of parliamentary seats, prevents intense competition for political prizes among different religious communities (Harik, 1980).

Table 16 Distribution of parliamentary seats per religious groups

Muslims	**64**		**Christians**	**64**
Sunni	27		Maronite	34
Shiite	27		Greek Orthodox	14
Druze	8		Greek Catholic	8
Alawite	2		Armenian Orthodox	5
			Armenian Catholic	1
			Evangelical	1
			Minorities	1

Source: IFES (2009a)

The Parliament is elected by a plurality system (First-Past-The-Post FPTP) for a mandate of four years. Candidates run for elections in a multi-seat, multi-sect constituency. They are gathered in competing but open electoral lists balanced across sectarian lines (Salloukh et al., 2015). They can run either as independents or by appointment of their political parties. They should be Lebanese citizens for more than ten years, at least 25 years old, educated, and benefiting from all their civil and political rights (1960 Electoral Law, 1960).

The voting must be universal, by secret ballot, and completed in one round. As for the distribution of parliamentary seats among confessions, it is determined according to administrative districts (see Table 17). The candidate contesting for a seat has to be from the same confession to which the seat is allocated. Seats are won by whichever candidate from that confession gains the plurality (i.e., the highest number) of the votes cast. If there is more than one seat allocated to a confession, the seats are won by as many candidates as there are seats available.

Table 17 Geographical and confessional distribution of parliamentary seats

Administrative District	Seat/Confession
Beirut 1	1 Orthodox 1 Catholic 1 Maronite 1 Armenian Catholic 1 Armenian Orthodox
Beirut 2	1 Sunni 1 Shiite 2 Armenian Orthodox
Beirut 3	5 Sunni 1 Shiite 1 Orthodox 1 Druze 1 Evangelist 1 Minorities
Keserwan	5 Maronite
Byblos	2 Maronite 1 Shiite
Matn	2 Orthodox 4 Maronite 1 Armenian Orthodox 1 Catholic
Baabda	3 Maronite 1 Shiite 1 Druze
Aley	2 Druze 2 Maronite 1 Orthodox
Chouf	2 Druze 3 Maronite 2 Sunni 1 Catholic
Sidon	2 Sunni
Sidon villages	1 Catholic 2 Shiite
Tyre	4 Shiite
Bint Jbeil	3 Shiite
Jezzine	2 Maronite 1 Catholic
Marjeyoun	2 Shiite 1 Orthodox 1 Sunni 1 Druze
Nabatiyeh	3 Shiite
Akkar	1 Alawite 1 Orthodox 3 Sunni 1 Maronite
Minnieh- Donnieh	3 Sunni
Bcharreh	2 Maronite
Tripoli	1 Maronite 5 Sunni 1 Alawite 1 Orthodox
Zgharta	3 Maronite
Koura	3 Orthodox
Batroun	2 Maronite
Baablbak-Hermel	6 Shiite 2 Sunni 1 Catholic 1 Maronite
Zahle	2 Catholic 1 Orthodox 1 Armenian Orthodox 1 Maronite 1 Shiite 1 Sunni
West Bekaa-Rachaya	1 Orthodox 1 Maronite 2 Sunni 1 Druze 1 Shiite

Source: Lebanese Parliament (2000)

Regardless of their confessional affiliation, voters vote for all seats in the district in a single ballot paper. They are entitled to choose as many candidates as the number of seats assigned to the constituency (Harik, 1980). They have the right to remove or add candidates from pre-arranged electoral lists, as long as the sectarian balance of the list remains the same (Salloukh et al., 2015). Eligible voters should be Lebanese, above 21 years old, and having all their civil and political rights (1960 Electoral Law, 1960). They vote in their ancestral village rather than their residential district.

The quota system forces candidates to compete against contenders from their own sect because the number of seats to which a sect is entitled in a constituency is defined by law (Harik, 1980). Within each sect, the candidate receiving the highest number of votes ultimately represents that confession in Parliament. This makes the contest intra-, not inter-sectarian, and reduces the chances of sectarian clashes during the elections (Harik, 1980). Salloukh et al. (2015) consider that the primary determinant of electoral results is the sectarian demographic composition of the electoral districts.

The electoral districting used until the 2009 elections to configure confessions is based on five large governorates (*Muhafazat*) that are subdivided into smaller constituencies (*qadas*) — see Table 18 (Ekmekji, 2012).

2.3.2.2. Elections

The first post-war parliamentary election was held in 1992. The number of seats increased from 108 to 128 as per Law 154 of 1992. However, the increase in the number of seats, despite maintaining the Parliament divided equally between Christians and Muslims, was not allocated in such a way as to represent the actual increase in the number of voters belonging to each religion. For instance, the new Christian seats were allocated in regions where the balance of votes favored Muslims rather than Christian voters (Salloukh et al., 2015). Adding to this, the proportion of deputies per number of voters varied tremendously among electoral districts. Such malapportionment distorted the electoral results and favored economically developed districts at the expense of less developed ones (Salloukh et al., 2015). Gerrymandering was also used in order to channel votes for the favor of specific political/sectarian where the size of electoral districts was modified several times between 1992 and 2009 — see Table 18. Turnover of eligible voters in some Christian areas was low in the 1992 parliamentary elections because some voters objected to voting in the presence of Syrian troops (Youngblood-Coleman, 2016).

Table 18 Structure of constituencies (electoral districts)[22] in Lebanon by election year

Governorate		*Qadas*/Administrative Districts	1996	2000	2005	2009
BEIRUT	1	Beirut I (Areas)	1	Beirut I	Beirut I	Beirut I
	2	Beirut II (Areas)		Beirut II	Beirut II	Beirut II
	3	Beirut III (Areas)		Beirut III	Beirut III	Beirut III
MOUNT LEBANON	4	Keserwan	1	Mount I	Mount I	1
	5	Byblos	1			1
	6	Almatn	1	Mount II	Mount II	1
	7	Baabda	1	Mount III	Mount III	1
	8	Alay	1			1
	9	Chouf	1	Mount IV	Mount IV	1
SOUTH & NABATIEH	10	Sidon	1	1	South I	1
	11	Sidon Villages				1
	12	Tyre				1
	13	Bint Jbeil				1
	14	Jezzine			South II	1
	15	Marjeyoun-Hasbaya				1
	16	Nabatieh				1
NORTH	17	Akkar	1	North I	North I	1
	18	Bcharreh				1
	19	Donnieh (Area)				1
		Minieh (Area)		North II	North II	
	20	Tripoli				1
	21	Zgharta				1
	22	Koura				1
	23	Batroun				1
BEKAA	24	Baalbek-Hermel	1	Bekaa I	Bekaa I	1
	25	Zahleh		Bekaa II	Bekaa II	1
	26	West Bekaa-Rachaya		Bekaa III	Bekaa III	1
Total Constituencies			**10**	**13**	**14**	**26**
Election Laws			Law 587 13/08/1996	Law 171 06/01/2000	Law 171 06/01/2000	Law 25 08/10/2008 RECTIFIED Law 59 27/12/2008

Source: Lebanese Parliament (2000)

[22] **2000 & 2005**: Beirut I: Mazraa, Achrafieh and Sayfeh areas; Beirut II: Msaytbeh, Bachoura and Rmeil areas; Beirut III: Ras Beirut, Ain Mreiseh, Marfaa, Meena Hosn, Zkak Blat and Medawar areas. **2009:** Beirut I: Achrafieh, Sayfeh and Rmeil areas; Beirut II: Medawar, Marfaa and Bachoura; Beirut III: Mazraa, Msaytbeh, Ras Beirut, Ain Mreyseh, Meena Hosn and Zkak Blat areas.

Parliamentary elections that took place in 1996 were not much different from those of 1992, where many Christians continued to call for the boycotting of the elections. Sectarian consciousness remained high (Hudson, 1999). These elections took place according to electoral law number 587, which was based on amendments made to the 1960 electoral law and stipulated ten electoral districts (see Table 18). This meant that elections in Mount Lebanon were arranged separately for each local district (*qada*) and not at the level of the governorate Mohafaza, as in the remaining districts. Such separation of electoral districts serves sectarian, political, or personal interests (El Khazen, 1998)— see Appendix B 1 for candidates and winners in 1996 elections.

El Khazen (1998) considered that this law violated the constitution with regards to the following points: the distribution of electoral districts was not the same in all districts; disparities existed at the level of seats and voters between one electoral district and another. Additionally, three different electoral patterns existed. In Beirut, the nomination of candidates and the voting followed the level of the *Muhafaza* as an electoral district. In the North, Bekaa and the South, the nomination of candidates was made at the level of *qada*, but the voting was at the *Muhafaza* level. Finally, in Mount Lebanon, the nomination of candidates and the voting followed the level of *qada*. The distribution of seats among the different confessions was the same as that in the 1992 elections.

Parliamentary elections that took place in 2000 and 2005 were based on a new electoral law (number 171), which included amendments to the 1996 law. These amendments were mainly related to the size of electoral districts rather than the electoral law (El Khazen, 2002). Seats were allocated among 13 electoral districts (instead of 10 as per the 1996 elections): the eight *qadas* in the North formed two districts; the eight *qadas* in the south formed two districts; the six *qadas* in Mount Lebanon formed four districts (Law Number 171: Modification of Parliament, Municipal and Mukhtars Electoral Law (Arabic), 2000). These amendments were made in order to preserve the position of certain political parties and to marginalize others, especially in the parliamentary elections in 2000 (El Khazen, 2002)— see Appendix B 2 and B 3 for candidates and winners in 2000 and 2005 elections.

Despite the fact that the 2005 parliamentary election was conducted under the same electoral law as that of 2000, the context that preceded these elections was totally different. Syrian troops had withdrawn from the

Lebanese territory, there was growing international pressure to disarm Hezbollah, and, in addition to the succeeding staggering events, PM Hariri was assassinated (Rizk, 2007).

According to Corm (2012), between 1992 and 2005, Lebanon was under Syrian-Saudi dominance, where the constitutional practice reinforced the communitarianism. Most of the constitutional power was in the hands of the PM and not the cabinet members, as stipulated by the constitution. Islamic radicalism and the radicalism of the western states placed relations between Sunni and Shiite center stage in the problems facing Lebanon. As for the Christians, an important modification occurred that created a sort of democratic consociationalism – the alliance between the Free Patriotic Movement (FPM) and Hezbollah.

Fall 2006 witnessed mass protests from pro-Syrian and Hezbollah groups demanding the resignation of PM Siniora. This group was known as 'the forces of March 8' in opposition to 'the forces of March 14'. The Christians of March 14 were allied with the Sunni Future Movement, which was in symbiosis with the KSA and eventually with the USA.

Two years after the assassination of PM Rafik Hariri, Lebanon was deeply divided along sectarian lines between Shiite Muslims, Sunni Muslims, and Maronite Christians. Lebanon was also politically fragmented between pro-Syrian and pro-Hezbollah factions on one end of the equation and pro-western enclaves on the other end (Youngblood-Coleman, 2016).

Rival political leaders met on May 18, 2008, in Doha, Qatar, and reached the Doha agreement, which stipulated the formation of a new government and the election of a new President of the Republic. Effectively, a couple of days later, Michel Suleiman was elected President, and Fouad Siniora appointed as PM. In June 2009, parliamentary elections were held in Lebanon as per the 1960 electoral law. It consisted of 26 electoral districts, which are the same 26 administrative districts *qadas* — see Appendix B 4 for candidates and winners in 2009 elections. Saad Hariri was nominated as PM; however, his government collapsed in 2011 after the resignation of 10 ministers of Hezbollah and his allies who were not able to convene the government to oppose the UN special tribunal that led the investigation into the assassination of the late PM Rafik Hariri. Four months later, Najib Mikati, the new appointed PM, formed a new government in which the FM and the March 14 alliance members refused to take part (Youngblood-Coleman, 2018).

Meanwhile, the repercussions of the Syrian conflict started to slip over into the Lebanese scene. Several violent conflicts occurred in the capital city, Beirut, and in the northern parts of the country between pro-Syrian activists and Sunnis backing the Syrian opposition. The internal intelligence chief, Wissam Al Hassan, who supported the March 14 alliance, was assassinated in a car bombing in October 2012. A few months later, PM Mikati resigned, and Tammam Salam was appointed to form a new government.

The parliamentary elections that were supposed to take place during June 2013 were postponed.

During subsequent years, Lebanon witnessed several assassinations targeting pro-Hezbollah as well as pro-March 14 alliance. The Lebanese army and security forces, as well as the southern suburb of Beirut largely inhabited by pro-Hezbollah Shiite, were the targets of many suicide and car bombings. Tensions accelerated, particularly in border areas between Lebanon and Syria, where Syrian terrorist militants became active.

In late 2014, the term of the President of the Republic, Michel Suleiman, came to an end. Two years passed without reaching a consensus among the different Lebanese factions on who would be the next president of the republic. Finally, on 31 October 2016, the former commander of the Lebanese army, General Michel Aoun, was elected President of the Republic, and PM Saad Hariri was appointed to form a new government.

On the security level, the Lebanese army forces and intelligence security were able to ensure stability across all Lebanese territory and to eliminate any remaining terrorists in the border areas of Lebanon.

In June 2017, the government passed a new electoral law that would govern the elections scheduled on May 6, 2018 (Daily Star, 2018). This electoral law is based on proportional representation. It divided the country into 15 electoral constituencies (comprising one or more electoral districts). The elections effectively took place on May 6, 2018, with a turnout of 49.7%.

2.4. Empirical model

Since the end of the Lebanese civil war, more than 20 political parties obtained seats in the Lebanese parliament. However, most of them were small and concentrated in specific constituencies.[23] The six major political parties are: Amal movement (AMAL), Hezbollah (HEZ), Future Movement (FM),[24] Progressive Socialist

[23] See Appendices B 6 to B 9 for election results.

[24] FM was officially established in 2007 after the assassination of PM Hariri 2005. Before 2005, it existed under the name of the Hariri coalition.

Party (PSP), Lebanese Communist Party (LCP), Syrian Social Nationalist Party (SSNP), and Independents of March 14 coalition (M14), which appeared after the assassination of PM Hariri in 2005. In our analysis, we will consider only the six major parties and independent candidates[25] (IND), that is, candidates that are not affiliated to any political party.

To explain party choice, our model includes economic, political, and social variables. Our data set covers the 26 administrative districts of Lebanon over the parliamentary elections that took place in 1996, 2000, 2005, and 2009.[26]

The baseline model can be specified as follows:

$$V_{d,t}^{i} = \alpha^{i} + \beta^{i} POL_{d,t} + \gamma^{i} SOCECO_{d.t} + \delta^{i} REL_{d,t}^{i} + \varepsilon_{d,t}, \qquad (\mathbf{3})$$

for i=AMAL, HEZ, FM, PSP, LCP, SSNP, M14 and IND; t= 1996, 2000, 2005, and 2009; and d=1, ..., 26

Where i represents the political party, t represents the election year and d the district.

The dependent variable is the vote share of party i, in district d, in the election held in year t. $\varepsilon_{d,t}$ represents the error term, α is a parameter to be estimated and β, γ and δ are vectors of parameters to be estimated. The right-hand side of the equation includes vectors of explanatory variables that are associated with political, socio-economic and religious variables.

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[25] Christian and other political parties obtained seats in parliament; however, since they run in a limited number of districts/year, the number of observations was insufficient to run regressions and to include them in our analysis.

[26] **The 1996 parliamentary elections took place on** : 18 August 1996 in Mount Lebanon Governorate (Keserwan, Byblos, Matn, Baabda, Alay, and Chouf); 25 August 1996 in the North Governorate (Akkar, Bcharreh, Donnieh, Minieh, Tripoli, Zgharta, Koura, and Batroun); 1 September 1996 in Beirut Governorate (Beirut I, Beirut II, and Beirut III); 8 September 1996 in South Governorate (Sidon, Sidon-Villages, Tyre, Bint-Jbeil, Jezzine , Marjeyoun- Hasbaya, and Nabatiyeh); and 15 September 1996 in the Bekaa Governorate ((Baalbak-Hrermel, Zahle, and West- Bekaa- Rachaya).

The parliamentary elections of 2000 took place on: 27August 2000 in Mount Lebanon Governorate (Keserwan, Byblos, Matn, Baabda, Alay, and Chouf), and the North Governorate (Akkar, Bcharreh, Donnieh, Minieh, Tripoli, Zgharta, Koura, and Batroun); 3 September 2000 in Beirut Governorate (Beirut I, Beirut II, and Beirut III), the South (Sidon, Sidon-Villages, Tyre, Bint-Jbeil, Jezzine , Marjeyoun- Hasbaya, and Nabatiyeh) and Bekaa Governorates (Baalbak-Hrermel, Zahle, and West-Bekaa- Rachaya).

The 2005 parliamentary elections took place on : 29 May 2005 in Beirut Governorate (Beirut I, Beirut II, and Beirut III); 12 June 2005 in Mount Lebanon Governorate (Keserwan, Byblos, Matn, Baabda, Alay, and Chouf); 5 June 2005 in the South and Nabatiyeh Governorates(Sidon, Sidon-Villages, Tyre, Bint-Jbeil, Jezzine , Marjeyoun- Hasbaya, and Nabatiyeh); 19 June 2005 in the North Governorates (Akkar, Bcharreh, Donnieh, Minieh, Tripoli, Zgharta, Koura, and Batroun); and 12 June 2005 in the Bekaa Governorate (Baalbak-Hrermel, Zahle, and West- Bekaa- Rachaya).

The parliamentary elections of 2009 took place on 7 June 2009.

The vector of political variables includes the average number of ministers that a party has had in office since last election, and the total number of political assassinations and bombings that occurred in district *d* in the election year. The socio-economic performance of each electoral district is captured by the unemployment rate, real income *per capita*, and the percentage of households that have access to water in the election year. The vector of religious variables includes the share of voters belonging to the several religious groups.

For consistency of the results, the same method was used to select the relevant variables for all party equations. We started by putting only one variable from each group. The variables initially selected were: the number of ministers, among the political variables; income per capita as a socio-economic variable; and the sect to which the political party is associated as a religious variable (i.e. Shiite for Amal and Hez, Druze for PSP, Sunni for FM).

Other variables from each group were then added to the model, one at a time. Only the statistically significant variables were left in the model.

We extract data for political variables from public administrations, international organizations, and local newspapers. For the 2009 and 2005 election results, the references used are those of the Ministry of Interior and Municipalities in Lebanon, the International Foundation for Electoral Systems, and Information International. Regarding the two previous elections (2000 and 1996), the data is from the archives of local newspapers. Data for the total number of assassinations and bombings was obtained from local newspapers (Al Shark, 2005 and 2006; L'Orient Le Jour, 2007; Annahar, 2008). Data on political parties in office comes from the Lebanese presidency of the Council of Ministers — see Appendix B 10 for political parties in office during election years.

Regarding the unemployment rate, access to water, and income, the data is from the Central Administration of Statistics (CAS), country reports of the United Nations Development Program (UNDP), and the World Development Indicators (WDI). All variables have an annual frequency.

We report the descriptive statistics for the variables used in the empirical model in Table 19. The party with the lowest share of votes is the LCP (3.58%), whereas political parties who were able to capture the highest share of votes are Independents with an average of 40%, followed by FM (37.7%), and AMAL (27.6%). In some districts, IND obtained a maximum of 100% of the votes. As for the average number of years for independents in office since the last election is 7.9 years. Regarding the variable total number of assassinations and

bombings in each district during the election year; results show that, on average, there have been 0.135 assassinations per district. A maximum of 5 bombings and assassinations occurred, whereas in other districts, there have been no assassinations or bombings.

Regarding socio-economic variables, the unemployment rate is 8.16% on average in the election year. In some districts, the unemployment reached a maximum of 14.8%, but it did not go below 4.3%. The real per capita income is 4430$ on average. 78.1% of households have access to water on average in all the administrative districts. In some districts, access to water reached 98%, while in others, it did not exceed 30% of total households.

When we take into consideration the religious sect of voters, we notice, on average, the following: 23.6% of voters belong to the Muslim Shiite sect; 23.3% are Muslim Sunni; 4.95% are Muslim Druze; 0.481% are Muslim Alawite; 28.3% are Christian Maronite; 5% are Greek Catholic; 8.71% are Greek Orthodox; 0.369% are Protestant Evangelical; 0.6% are Armenian Catholic; 2.61% are Armenian Orthodox; 1.49% are Christian minorities; and 0.5% belong to other religions like Jews.

Table 19 Descriptive statistics

VARIABLES	(1) N	(2) mean	(3) Sd	(4) min	(5) Max
% votes of Amal Movement	30	0.276	0.197	0.0242	0.648
% votes of Hezbollah	29	0.223	0.130	0.0219	0.489
% votes of Future Movement	29	0.377	0.221	0.0754	0.849
% votes of Progressive Socialist Party	16	0.120	0.0423	0.0711	0.196
% votes of Lebanese Communist Party	29	0.0358	0.0307	3.09e-05	0.114
% votes of Syrian Social Nationalist Party	29	0.0813	0.0612	0.00746	0.205
% votes of Independents of 14 March coalition	31	0.232	0.106	0.0344	0.442
% votes of Independents	100	0.400	0.300	0.00143	1
The average number of ministers that Independents had in office since the last election	104	7.917	2.087	4.500	9.666
Total number of assassinations and bombings	104	0.135	0.654	0	5
Unemployment rate	104	0.0816	0.0203	0.043	0.148
Real income per capita (in thousands)	104	4.430	1.793	1.728	8.799
Percentage of households that have access to water	104	0.781	0.150	0.300	0.980
% of voters belonging to the Muslim Shiite sect	104	0.236	0.306	0	0.952
% of voters belonging to the Muslim Sunni sect	104	0.233	0.271	0.000409	0.851
% of voters belonging to the Muslim Druze sect	104	0.0495	0.117	0	0.528
% of voters belonging to the Muslim Alawite sect	104	0.00481	0.0156	0	0.0776
% of voters belonging to the Christian Maronite sect	104	0.283	0.296	0.0143	0.991
% of voters belonging to the Christian Greek Catholic sect	104	0.0509	0.0485	0.000586	0.201
% of voters belonging to the Christian Greek Orthodox sect	104	0.0871	0.122	3.24e-05	0.646
% of voters belonging to the Christian Protestant Evangelical sect	104	0.00369	0.00317	0	0.0129
% of voters belonging to the Christian Armenian Catholic sect	104	0.00620	0.0120	0	0.0592
% of voters belonging to the Christian Armenian Orthodox sect	104	0.0261	0.0545	0	0.268
% of voters belonging to the Christian Minorities	104	0.0149	0.0223	8.10e-06	0.107
% of voters belonging to Other religions	104	0.00510	0.00784	8.16e-06	0.049

Sources: Addiyar (1996); Alhayat (1996); Annahar (1996**,** 1996b, 1997, 2008**);** Al Shark (1996, 2005); CAS and UNICEF (2010); CAS (1997, 1996, 1998a, 1998b, 2000, 2005) (Central Administration of Statistics *et al.*, 2008) MOSA and UNDP (2007); UNDP (2008); Chambers (2009); LADE et al. (2010); MOIM (1996, 2005a, 2005b, 2005c, 2005d, 2005e, 2006, 2009, 2010**);** Nohlen, Grotz, and Hartmann (2003); El Khazen (1998); NDI (2009); EU (2009); IFES (2011, 2009b)**;** L'Orient Le Jour (2000); Atallah (2000); Lebanonwire, n.d.**;** Information International (2009a, 2009b, 2009c, 2009d, 2009e)**;** Nationl Information Agency (1996); World Bank (2017) and Center for Educational Research and Development (2017)**.**

2.5. Empirical results

OLS method is commonly used in the literature on voting and popularity functions.[27] In spite of the panel structure of our data (4 election years in 26 districts), we only report Pooled OLS (POLS) estimates, with robust standard errors, because most of the times each party only runs in about 10 districts.[28] Still, we also estimated a random-effects model and the results are basically the same as the ones that we report for POLS.[29] We report our results party by party starting with Muslim Shiite parties (Amal and Hezbollah), followed by a Muslim Sunni party (Future Movement), a Muslim Druze party (Progressive Socialist Party), then secular parties (Syrian Social Nationalist Party and Lebanese Communist Party) and Independents (M14 Independents and Independents). Christian and other political parties obtained seats in parliament; however, since they run in a limited number of districts/year, the number of observations was insufficient to run regressions. Therefore, only the previously mentioned political parties will be considered.[30]

The main limitation of our data is the sample size. Because not all parties run in all districts and/or all years, most of our regressions have only a few observations —16 in the case of the Progressive Socialist Party, 100 in the case of Independents, and about 30 in the other cases. This is not unprecedented in this type of work. Magalhães and Aguiar-Conraria (2009), and Magalhães, Aguiar-Conraria, and Lewis-Beck (2012) had less than 15 observations for Portugal and Spain. Dassonneville and Hooghe (2012) were able to make accurate forecasts for Belgian elections even when the sample size was reduced considerably (sample size varied between 10 and 20 observations). A strong predictive model for Norwegian elections was also made with 31 to 33 observations by Arnesen (2012). Finally, despite very few observations, Turgeon and Rennó (2012) were able to make valid election forecasts for four Brazilian presidential elections by using subnational and national data.

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[27] See, among others, Frey & Schneider, 1978a; Frey & Schneider, 1978b; Nannestad & Paldam, 1997; Veiga, 1998; Lewis-Beck & Nadeau 2000; Veiga & Veiga, 2004; Magalhães & Aguiar-Conraria, 2009; Drazen & Eslava, 2010; Magalhães, Aguiar-Conraria, & Lewis-Beck, 2012, Elsayyad & Hanafy, 2014.

[28] Given the small number of clusters and the small number of observations per cluster, it would be heroic to adjust standard errors for clusters.

[29] Given the small number of observations, it would be too costly to estimate a model with fixed-effects. This is unlikely to be a problem given that, by far, the most important explanatory variables are the religions shares, which one can consider to be exogenous, especially because each elector votes in his/her ancestral village rather than their residential district.

[30] Other political parties have been in office while not having any seat in parliament (i.e. Frangieh bloc) because according to the 1943 national pact (which established the Lebanese political system) all (the major) political parties (which represent specific religious groups) should always be represented in the government even if voters did not elect them. Their exclusion will be interpreted as the exclusion of a certain religious sect or geographic area from the political life.

As is well-known, the problem of small data sets is similar to the problem of multicollinearity — e.g., Magalhães and Aguiar-Conraria (2009); therefore in each step of our analysis, we perform a series of tests. To avoid losing degrees of freedom, we keep each model with a minimum of variables, avoiding the problem of including irrelevant variables and we always compute the Variance Inflation Factors (VIF) and condition index test (Belsley 1991) to assess the severity of the sample size problem. Finally, given the small sample size, it is possible that one observation has a significant impact on the final results (because the effects of an outlier are not washed away by a big sample). To test if this is a problem we compute Cook's distance to find candidates for influential observations and re-estimate the model without them.

2.5.1. Amal Movement

Amal Movement was established in 1974 by Imam Moussa Al Sader, a Shiite leader who began to mobilize the Shiite community in the 1960's to bring it into the Lebanese mainstream, end its political dysfunction (CIA, 1981) and to promote its cause (Collelo, 1987). Amal Movement participated in the Lebanese civil war as the military and political wing of Lebanon's Shia community. By the early 1980s, it was the most powerful organization within the Shia community before sharing the Shiite political scene with Hezbollah as of the 1990s.

Amal's ideology stresses resistance to Israel; it advocates for national unity and equality among all citizens and rejects confederation schemes. However, it was not able to attract many supporters outside the Shiite sect.

Our main results regarding AMAL are in Table 20. As one would expect, religious factors dominate the model. Religious variables explain about 80% of the variance. Being AMAL a party associated with the Shiite, it is not surprising that the associated cofficient is positive and significant. The coefficient estimations regarding the other religions exhibit surprisingly high values. However, both the Alawites and the Armenian Catholics represent very small fractions of the electorate. Therefore, one should not interpret those cofficients as direct votes against or for AMAL. It is rather more likely that they somehow capture some of the cultural effect of the religious composition of each district. Despite the fact that AMAL has been in office during the entire period analysed (recall table B 10 in Appendix) socio-economic variables did not turn out as statistically significant.

Table 20 Election model for Amal Movement

AMAL	Pooled OLS	
	Coefficients	Robust Std. Err.
Shiite	0.586***	0.054
Alawite	-725.15***	78.40
Armenian Catholic	10.113***	0.92
Constant	-0.0047	0.034
R-squared	0.80	
Number of Observations	30	

Note: The dependent variable is the vote share of AMAL in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

Regarding the problem of having only 30 observations, we estimated the VIFs associated with each explanatory variable and the condition index. The highest VIF is 1.71 and the condition index is 2.16; both significantly below the values that suggest problems. Finally, we computed Cook's distance for each observation and identified none above the threshold of 4 (#observations).

2.5.2. Hezbollah

A group of Shiite clerics broke away from Amal Movement to establish Hezbollah in 1982. They responded militarily to the Israeli invasion of Lebanon. They received considerable military support from Iran's Revolutionary Guards. The party's ideology calls for the destruction of the state of Israel and for the establishment of an Islamic republic in Lebanon. At the end of the civil war and the disarmament of militias, Hezbollah was allowed to keep its weapons as a military Islamic resistance dedicated to end Israel's occupation of Lebanese territory despite the division of the public opinion in this regard (BBC, 2016). Hezbollah is present militarily and politically in the predominantly Shiite areas in Lebanon.

Table 21 Election model for Hezbollah

HEZBOLLAH	Pooled OLS	
	Coefficients	Robust Std. Err.
Shiite	0.369***	0.045
Others	-1.564*	0.845
Income per capita (in thousands)	0.0201***	6.74e-03
Constant	-0.0714*	0.041
R-squared	0.73	
Number of Observations	29	

Note: The dependent variable is the vote share of HEZ in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

Results for Hezbollah are presented in Table 21. Again religious factors are the most important. As expected, the coefficient of Shiite is significant and positive as Hezbollah is only positively associated with the Shiite sect. Removing the economic variable, one gets an R2 of 66%. Still, the economy plays a role. In this case, we have real income per capita. This result is not surprising given that the party contributed, particularly while in office, in rebuilding and developing districts that were targeted by several Israelis wars.

Regarding our diagnoses, the mean VIF is 1.26, with the largest being 1.39, and the condition index is 1.81. Therefore, there is no evidence, or, at least, no strong evidence, that multicollinearity is a problem. However, we identified one observation above the Cook's distance threshold. After removing it, and re-estimating the model the results remained similar.

2.5.3. Future Movement

Future Movement was established in 2007, two years after the assassination of prime minister, Rafik Hariri. Prior to that, Hariri and his allies who became members of the FM, used to run elections under the name 'the Hariri Bloc'. The Movement is officially secular but predominantly supported by the Sunni Muslims of Lebanon. It is politically opposed to the March 8 Alliance which includes mainly Hezbollah, Amal and the Free Patriotic Movement members. The Future Movement has allied itself with Sunni Islamist groups and has courted Sunni Islamists to gain votes and win elections (Schwerna, 2010).

Table 22 Election model for Future Movement

FUTURE MOVEMENT	Pooled OLS	
	Coefficients	Std. Err.
Sunni	0.432***	0.120
Druze	-0.82***	0.232
Greek Catholic	-1.638***	0.49
Alawite	-4.84**	1.81
Income per capita (in thousands)	0.033**	0.015
Constant	0.186	0.108
R-squared	0.71	
Number of Observations	29	

Note: The dependent variable is the vote share of FM in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

The fit of this model is not as high as the two previous ones, although it is still very high. This happens mainly because the religious composition of the electorate only explains 64% of the variance of the dependent variable, probably because the Future Movement is, officially, a secular party. FM is known to be connected to the biggest businesses from different religious affiliations, especially in Beirut and Tripoli districts. The most salient feature of our results is that income per capita is statistically significant. A decrease in income per capita hurts the prospects of this party. Given that this party has been in office since its creation and, on average, has more than 5 members in office, it is likely that electors are rewarding (or punishing) this party based on economic performance.

As before, our tests do not show evidence that the small sample is a big issue. The condition index is 2.02 and the largest VIF is 1.48. Cook's distance measure indicates that there are 4 possible influential observations. Running the model without them had no relevant impact on the results.

2.5.4. Progressive Socialist Party

The Druze leader, Kamal Jumblat, established the Progressive Socialist Party on May 1, 1949. PSP ideology is based on the equality of all citizens, in terms of duties and obligations, freedom, justice, cooperation and solidarity (Nassereddine, 1967). During the Lebanese civil war, the PSP was on the leftist front in what was known as the Lebanese national movement.

During the early years of the establishment of the PSP, the majority of the supporters were Druze people. They formed around 80% of the total membership. Intellectuals from different religious groups joined the party as well. Today, the PSP is considered to be the leading Druze political party in Lebanon (Global Security, 2013).

Table 23 Election model for the Progressive Socialist Party

PROGRESSIVE SOCIALIST PARTY	Pooled OLS	
	Coefficients	Std. Err.
Druze	0.292***	0.018
Greek Orthodox	-0.849***	0.047
Protestant Evangelical	2.820**	1.216
Access to Water	0.1461***	0.019
Constant	-0.025	0.019
R-squared	0.96	
Number Observations	16	

Note: The dependent variable is the vote share of PSP in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

In Table 23, we can see that this is the regression with the lowest number of observations – only 16. Still, it is worth noting that only 4 explanatory variables explain 96% of the variance. The religious variables explain about 82% of the variance, so the variable Access to Water has a very strong explanatory power, suggesting that more developed districts have a much higher propensity to vote for PSP. Since PSP won parliamentary seats in every election, the statistical significance of Access to Water may also be interpreted as evidence in favor of the responsibility hypothesis.

Finally, the condition index is 2.2, the largest VIF is 1.68, and removing the two potential influential observations does not have an important result in our estimates.

2.5.5. Lebanese Communist Party

A group of intellectuals who were actively promoting the ideas of the French revolution and were familiar with the writings of Karl Marx and Friedrich Engels, established the Lebanese Communist Party in 1924. It is one of the oldest multi-sectarian parties in Lebanon. They participated in the Lebanese civil war and were on the leftist front or what was known as the Lebanese national movement, which mainly supported the Palestinian Liberation Organization against the Christian Lebanese Front (Collelo, 1987). The LCP ran for all

parliamentary elections that took place since 1992 but did not win a single seat. In 2005, a former secretary general of LCP, George Hawi, a recent critic of Syria, was assassinated in a car bombing. Allies of Hawi accused Syria of the assassination.

Table 24 Election model for the Lebanese Communist Party

LEBANESE COMMUNIST PARTY	Pooled OLS	
	Coefficients	Std. Err.
Druze	-0.123***	0.036
Alawite	-0.635***	0.144
Protestant Evangelical	3.64*	2.129
Constant	0.034***	0.087
R-squared	0.29	
Number of Observations	29	

Note: The dependent variable is the vote share of LCP in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

In the case of the Lebanese Communist Party, we can see that the religious composition of the electorate is not of the utmost importance, although it seems that the presence of more Druze Alawite is associated with a lower vote share.

Again, our tests do not show evidence that the small sample is a big issue. The condition index is 1.63 and the largest VIF is 1.26. We found one candidate to be an influential observation, but removing does not change the results. In this specific case, because the share of votes of the communist party is close to zero in several districts, we also estimated a fractional probit. The estimated marginal effects of each variable are almost the same as the coefficients of Table 24.

2.5.6. Syrian Social Nationalist Party

The Syrian Social Nationalist Party was founded by Antoun Saadeh in 1932. It aims at: creating a Syrian Social Nationalist renaissance which guarantees the achievement of the party's principles and brings back the Syrian nation (Lebanon, Syria, Palestine, Jordan, Iraq, Kuwait, and Cyprus) to strength and vitality; organizing a movement that leads to the complete independence of the Syrian nation and the vindication of its sovereignty; establishing a new order that ensures the nation's interest and raises its standards of living, and working towards creating an Arab front (Saadeh, 1948). The SSNP took part of the Lebanese civil war as

a member of the Lebanese national movement. SSNP is a secular party whose members are present in different geographical areas of the country.

Table 25 Election model for the Syrian Social Nationalist Party

SYRIAN SOCIAL NATIONALIST PARTY	Pooled OLS	
	Coefficients	Std. Err.
Sunni	0.520***	0.144
Shiite	0.637***	0.141
Druze	0.670***	0.131
Maronite	0.505***	0.140
Greek Orthodox	0.769***	0.129
Protestant Evangelical	5.63***	1.925
Armenian Catholic	3.34***	1.032
Unemployment	-0.355*	0.174
Constant	-0.474***	0.137
R-squared	0.83	
Number of Observations	29	

Note: The dependent variable is the vote share of SSNP in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

In Table 25, we can see that, as with other parties, the vote share of SSNP depends mostly on the religious composition of the district. However, their vote share is not restricted to a particular religious sect which is expected as they are considered a secular party. Still, as most of the times before, economics also plays a role. A higher unemployment rate is associated with a lower vote share.

This is the regression in which the small sample problems are stronger. The largest VIF is 74 and the condition index is 21. Removing the variable Shiite from the regression solves this problem, but the fit of the regression drops significantly.

2.5.7. Independents of March 14 coalition

This coalition was the result of the Cedar Revolution – the popular demonstrations that took place in Lebanon following the assassination of former Prime Minister, Rafik Hariri on 14 February 2005. March 14 coalition[31] was mainly formed of political parties and independents who were opposed to Syria and its allies in Lebanon

[31] Future Movement, Progressive Socialist Party, Lebanese Forces Party, Lebanese Phalange Party, Social Democrat Henchokian Party, Armenian Democratic Liberal Party, Ramgavar Party, Democratic Left Movement, Independence Movement, Renewal Democratic Movement, Change Movement and Liberal Nationalist Party.

known as March 8 coalition. Political parties and Independents of March 14 coalition are mainly associated with Christian religion, Sunni and Druze sects. The goals of March 14 coalition were mainly to establish an international investigation commission to reveal the perpetrators of the assassination of the former PM Hariri and to ask the parliament for discussing the series of assassinations that followed and revealing the truth. They called for the departure of the Syrian troops from Lebanon and for the support of the Arab countries and the international community (14 March Organization, n.d.).

Table 26 Election model for the Independents of March 14 coalition

MARCH 14 COALITION	Pooled OLS	
	Coefficients	Std. Err.
Druze	0.386***	0.092
Greek Catholic	-1.196***	0.262
Protestant Evangelical	-29.567***	4.357
Christian Minorities	2.780***	0.682
Constant	0.338***	0.030
R-squared	0.55	
Number of Observations	31	

Note: The dependent variable is the vote share of M14 in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

In Table 26, we can see that only religious variables seem to matter. Given that the Independents of March 14 coalition are not associated with specific religious sects, it is not surprising to see that the associated coefficient to Druze and Christian minorities is positive and significant.

2.5.8. Independents

This is the most interesting case for several reasons. First, we have 100 observations. Second, we found a richer model, which includes variables such as assassinations and the average number of ministers in the government.

Table 27 Election model for Independents

INDEPENDENTS	Pooled OLS	
	Coefficients	Std. Err.
Shiite	-0.438***	0.059
Greek Catholic	1.112***	0.378
Assassinations and Bombings	-0.052***	0.017
Income per capita (in thousands)	-0.082***	0.011
Average numbers of ministers	0.051***	0.008
Constant	0.415***	0.099
R-squared	0.60	
Number of Observations	100	

Note: The dependent variable is the vote share of IND in district d in election year t. The estimation method is POLS method. Robust standard errors are reported in the last column. ***p < 0.01, **p < 0.05, *p < 0.1

As for parties, religious variables also play a role for independent candidates. Districts with a larger share of Greek Catholic tend to vote more for independents, while they find less support among the Shiites. More violence hurts Independents, probably because violence increases polarization around established parties. Districts with high income per capita vote less for Independents. The latter benefit more when the number of independent ministers is large.

2.6. Conclusion

This chapter aimed at examining the effects of religious, socio-economic, and political variables on party choice in Lebanon. The POLS method was used to describe the link between the party choice on the one hand and three groups of independent variables on the other hand. Our empirical investigation faced limitations in the data used. However, despite these limitations, this paper is the first, to our knowledge, to empirically test the effect of religious, socio-economic, and political variables on party choice in Lebanon, over the four parliamentary elections under study. Our analysis was applied to six political parties and independent candidates in Lebanon. For each political party, only the most relevant explanatory variables were considered to avoid losing degrees of freedom. A series of tests were performed to make sure that the small number of observations was not a big issue.

As one would expect, in a multi-confessional and diverse society such as Lebanon, the religious factors are strong predictors of parties' vote shares. However, results also show that the state of the economy influences electoral results.

Religious variables, namely the percentage of voters belonging to specific religious sects, are particularly relevant for explaining the vote shares of the Amal Movement, the Hezbollah, the Progressive Socialist Party, and the Independents of the March 14 coalition. Being associated with the Shiite, it was not surprising to find that the vote share of the Amal Movement is positively and mostly associated with the percentage of voters belonging to the Muslim Shiite sect. A similar result was obtained for the vote shares of Hezbollah. A larger share of voters belonging to the Muslim Druze sect positively affects the vote shares of the Progressive Socialist Party and the Independents of March 14 coalition. The latter also benefits from a higher percentage of voters from Christian minorities. Furthermore, results suggest that the Lebanese Communist Party obtains more political support among Protestant Evangelical, and that Greek Catholics tend to support Independent candidates. Finally, religious variables also explained the vote share of the Syrian Socialist Nationalist Party, but are not restricted to a particular sect given the fact that it is a secular party with partisans having different religious affiliations.

Despite the importance of religious factors, socio-economic variables also explain Lebanese parties' vote shares. There is evidence that the state of the economy, namely income per capita, positively influences the vote share of the Hezbollah and the Future Movement and negatively that of Independents. The economy also plays a role in the vote shares of the Syrian Social Nationalist Party, where higher unemployment is associated with lower vote shares. Finally, more developed districts, with better access to water, vote more for the Progressive Socialist Party.

The richer model in our analysis is that of the Independents. Not only does this model exhibit the highest number of observations, but it also includes new significant variables such as bombings and assassinations and the number of independent ministers in the government. Districts that witnessed more violence penalized independents as voters might be polarized toward established parties. The analysis of the results also suggests that Independents benefit when the number of ministers is large.

CHAPTER 3: VOTER TURNOUT AT THE LEBANESE PARLIAMENTARY ELECTIONS

Abstract

This paper studies the impact of economic, political, sociodemographic, and institutional factors on the Lebanese voter's turnout. We estimate a dynamic turnout model using panel datasets covering 26 administrative districts over the five Lebanese parliamentary elections that occurred between 1996 and 2018. Although Lebanon is one of the few democracies in the Middle East, participation rates in the elections under study were significantly lower than those in Western democracies. In this multi-confessional country, it is not a surprise to find statistically significant results of the religious fragmentation factor. Nevertheless, other factors do matter as well in explaining turnout. Applying the system-GMM method, we found that an increase in the winning margin and unemployment lower participation in elections.

Keywords: Elections; Unemployment, Log population; Turnout; Winning margin.

3.1. Introduction

Participation in elections is a fundamental act of democracy. Political economists and political scientists have long been interested in investigating the reasons that explain voter turnout at the election polls. A vast and growing literature exists on participation in established and young democracies. From a theoretical perspective, Downs's 'rational choice' model explains people's decision to vote based on a cost-benefit analysis. However, it ignores an essential expressive feature, which is the moral obligation to vote (Fiorina, 1976; Blais et al., 2000). The group coordination process (Feddersen, 2004), the amount of available information about the candidate (Matsusaka, 1995), and the candidate's ethical approach (Goodin & Roberts, 1975) have also been considered theoretically by scholars.

On the empirical level, studies have stressed economic, sociodemographic, political, and institutional factors. In a recent meta-analysis of national and subnational elections, Cancela and Geys (2016) found that campaign expenditures, election closeness, and registration requirements have more explanatory power in explaining voter turnout in national elections; in contrast, population size and its composition, simultaneous elections, and the electoral system play a more critical role in explaining participation in subnational elections.

Most of these studies were conducted in well-established western democracies; very few were carried out in young democracies, and fewer in authoritarian and Arab countries. Lebanon is one of the few democracies in the Middle East where political organizations with sectarian orientations play a crucial role in meeting the basic needs of the population (Cammett & Issar, 2010), and compete to mobilize as many of the voters to attend the polls. However, very few studies have been devoted to revealing the determinants of voter turnout in Lebanon (Harik, 1980; Alhaber, 2007; de Miguel et al., 2015; Mourad & Garrote Sanchez, 2019; Garrote Sanchez, 2021). Furthermore, the existing literature presents individual-level analysis focusing on just one election.

In this paper, we analyze the factors that determined voter turnout in the 1996, 2000, 2005, 2009, and 2018 parliamentary elections. The analysis is implemented in 26 administrative districts and investigates which factors influenced the probability that a voter casts a vote at the district level. Different types of variables are used. They range from economic to sociodemographic, institutional, and political factors. To the best of our knowledge, this is the first aggregate-level study that investigates the above-mentioned factors over five Lebanese parliamentary elections.

The paper is organized as follows: Section 3.2 reviews the literature on voter turnout; Section 3.3 briefly presents the Lebanese setting; Section 3.4 discusses the empirical model and defines the data. The empirical results are shown in Section 3.5, and Section 3.6 concludes the study.

3.2. Literature review

Early theoretical models explaining voter turnout were developed by political scientists and were rooted in sociological and socio-psychological tradition. These models were based on expressive components of voting decisions, such as political interest, partisanship, sense of duty, and political efficacy. Voters are driven by the utility they get from expressing their political preferences, showing solidarity with their peer groups, and/or by contributing to the functioning of democracy and fulfilling of a civic duty (Fiorina, 1976). However, expressive voting ignores the economic aspect of political action and the rationality of voters.

In his rational choice theory, Downs (1957) showed that the decision to vote is purely instrumental. One may decide to vote as the result of a personal cost-benefit calculation in which the expected benefits of voting should outweigh its costs. The anticipated benefits of voting are equal to the value placed on the difference

in the positions of candidates multiplied by the probability that one vote will influence the election. Voters go to the polls to help their preferred candidate win. However, Downs (1957) realized that, in mass elections, the probability that an individual's vote affects the outcome is minimal, such that the costs of voting will outweigh the expected benefits. So his model predicted abstention. Yet, rational people continue to vote, a phenomenon known as the 'paradox of voting' (Fiorina, 1976; Mueller, 1989).

Fiorina (1976) and Riker and Ordeshook (1968) extended Downs' rational choice model by adding a social-psychological ingredient. The latter posit that citizens go to the polls because they may derive another kind of satisfaction, known as 'citizen duty', from voting itself. Such theorists contend that psychological satisfaction might outweigh the cost of voting. Their model includes both instrumental and expressive components of the voting decision.[32]

According to Blais et al. (2000), the rational choice model provides a useful but limited explanation of voting. In their study, based on a survey that was explicitly designed to test the rational choice model, the authors found that the moral obligation to vote, interpreted exogenously, is the most compelling motivation to go to the polls. Campbell et al. (1960) found that American voters with a strong sense of civic duty have a higher turnout rate than those with no sense of civic duty. In the same spirit, Verba et al. (1995), Tullock (2000), Clarke et al. (2004) and Blais and Galais (2016) suggest that civic duty is the essential motivation to vote.

Besides instrumental and expressive components of voting, scholars have considered three different theoretical approaches explaining observed participation levels at elections: group-based, information-based and ethical approaches.

Group-based theories emphasize the importance of the coordination process among voters to affect the election outcome. Voters might participate in elections because they are directly coordinated and rewarded by leaders (Feddersen, 2004). Filer et al. (1993) developed and empirically tested a model of rational choice that incorporates group behavior. In their model, voting may be rational, since the expected benefits can exceed the cost of voting at the group level. They examined the relationship between group-expected benefits and the cost of voting and income. Given that the government is the vehicle for income redistribution, elections are assumed to be the battlegrounds in the struggle over income distribution. If candidates differ over the

[32] For a revision of theoretical literature on turnout see Dhillon and Peralta (2002) and Smets and Ham (2013).

progressivity of the redistribution, individuals with high income have more to gain or to lose from the outcome of the election and will exhibit higher turnout rates. On the other hand, individuals with a high level of income place a greater value on time and thus find it costlier to go to the polls and vote in comparison to those with a lower level of income.

The information-based theories explain the impact of available information on an individual's decision to vote. Matsusaka (1995) developed an economic model of voter turnout, where he showed that voters with little information about the candidates will abstain from voting. Such behavior is in line with the cost-benefit calculation of the rational choice model, where a person's expected benefit from casting a decisive vote increases in line with his certainty that he is supporting the best candidate. As a result, voter turnout will increase as people become more confident and sure about the quality of candidates. Such behavior requires more information. The probability of turnout increases as long as voters can access information at a low cost. Similar results were attained by Feddersen and Pesendorfer (1999), who analyzed a model in which voters have asymmetric information and diverse preferences. They demonstrated how private information combined with preference diversity could result in two contradictory results: the turnout rate of more informed voters is higher than those with less information. However, turnout does not necessarily increase if the fraction of the informed electorate increases. This is due to the fact that, when the fraction of informed voters increases, the informativeness of the election result also increases and uninformed voters become more inclined to abstain.

According to the ethical approach, voters will consider the utilities of others when voting. They have moral preferences that will be included in their welfare function. Political men will behave ethically whenever the losses they expect from doing so are low enough to be outweighed by rewards. Politicians try to gain support among voters by a "moralizing crusade rather than focusing on questions of who gets what, when, and how" (Goodin & Roberts, 1975, p. 928).

On the empirical level, several explanatory variables were found to explain voter turnout. They are typically grouped into three categories: political, institutional, and socioeconomic variables (Geys, 2006b; Cancela & Geys, 2016).

Regarding political factors, three variables are found to have a substantial impact on voter turnout: electoral closeness, campaign expenditures, and political fragmentation. Most of the empirical literature found a positive effect on the probability of voters participating in elections resulting from these three variables

(Cancela & Geys, 2016). The impact of closeness on turnout in the election goes back to the assumption of the instrumental behavior defined by Downs (1957), where a closer election is expected to increase participation since each vote can have a decisive impact on the output. Cox and Munger (1989) and Shachar and Nalebuff (1999) argue that the positive effect of closeness in elections is due to the mobilization effects of political parties and candidates to persuade unconvinced voters to cast their votes. In his review of aggregate-level research, Geys (2006a) found a positive association between turnout and election closeness in 206 out of 362 empirical tests and in 36 out of 52 studies. Similar results were obtained by Cancela and Geys (2016), who extended the meta-analysis of Geys by adding 102 studies. More recently, Dubois and Leprince (2017) found evidence that closer elections are expected to have a higher turnout rate in small French towns in Brittany. However, in their meta-analysis of individual-level research on voter turnout, Smets and Ham (2013) did not find a statistically significant impact of electoral closeness on turnout at the national level.

Higher campaign expenditures appear to be associated with higher turnout, since this might increase awareness and information within the electorate and decrease the costs of information acquisition (Chapman & Palda, 1983). They reflect mobilization efforts by political parties (Cox & Munger, 1989; Fauvelle-Aymar & François, 2005). Empirical findings show that electoral spending is more significant in national, compared to subnational elections (Cancela & Geys, 2016).

Regarding political fragmentation, the number of studies confirming a positive effect of fragmentation on turnout is decreasing with time. Geys (2006a) discussed inconclusive results, whereas Cancela and Geys (2016) considered that political fragmentation has little direct, independent relationship to voter turnout.

The second category of covariates, which are regarded as the most potent determinants of turnout (Jackman, 1987; Jackman & Miller, 1995), are institutional variables such as the electoral system, compulsory voting, simultaneous elections, and registration requirements.

Turnout is affected differently under different electoral systems. Proportional systems are considered to increase the probability of voters going to the polls in the belief that their vote might make a difference. In majoritarian systems, the disproportion between voters and seats leads the former to think that their vote is of no importance (Geys, 2006b). A proportional system increases competition at the district level (Blais &

Carty, 1990), which gives parties more incentives to campaign everywhere and to be better linked to different groups in different districts.

As for compulsory voting, it is expected to increase turnout, especially in western democracies (Blais & Carty, 1990; Blais & Dobrzynska, 1998; Franklin, 2004; Blais, 2006), given the increased cost of not turning out to polls. However, Jackman (1987) argues that the impact of compulsory voting on turnout is contingent on the enforcement of these laws. Aguiar-Conraria & Magalhães (2010) found a positive effect of mandatory voting on referendums, more significant than that commonly found for general elections. The authors also found that participation quorums decreased electoral participation by more than ten percentage points for all referendums held in current European Union countries from 1970 until 2007.

Turnout is expected to increase with concurrent elections, as voters might be interested in at least one of these elections taking place simultaneously. The cost of voting does not increase with the number of elections the voter needs to cast a vote upon (Filer & Kenny, 1980). Also, more media and more campaign expenditures are expected to take place, which increases available information and electoral awareness and, consequently, increases turnout (Cox & Munger, 1989).

Although instrumental, expressive, and information-based theories discussed the effects of term limits on voter turnout, it is only relatively recently that this variable has been studied empirically. No effect was found by Hajnal & Lewis (2003), while Nalder (2007) found a negative one in his study of California state legislative races from 1976 to 2004. Veiga & Veiga (2018) found robust evidence that the presence of term-limited incumbents has a positive impact on turnout at the municipal and parish levels in Portugal.

The last institutional factor that might affect turnout is registration requirements. The existence of such conditions increases both monetary and information costs and thus makes it more difficult for voters to appear at the polls, which leads to lower turnout rates (Kelley et al. 1967).

Several socioeconomic variables have been associated with voter turnout: population size, population concentration, population stability, population homogeneity, previous turnout levels, and economic development. Their importance is more evident in subnational elections (Cancela & Geys, 2016).

It is expected that with greater population size, turnout decreases, as the probability that one single voice makes a difference becomes smaller. The same negative effect is found for population concentration, which

is often used to show the difference between urban and rural areas. The impact of population concentration on turnout is also negative, since it reduces personal ties and makes voters less likely to know all the candidates, parties, and policies. As Geys (2006a) argues, cities are more individualistic, such that there is less social pressure to cast a vote. As for population stability, it is expected to increase voter turnout. With more stability, voters have more identification and group solidarity, hence more social pressure to cast their vote. They become more informed about candidates and political parties when living for an extended period in the same region. All these factors contribute to increasing the turnout rate (Geys, 2006a).

Regarding population heterogeneity, usually measured by ethnic diversity or racial fragmentation, it is argued that more diversity reduces civic engagement and social cohesion and hence lowers voting turnout. Using survey data on group membership and data on US localities, Alesina and La Ferrara (2000) found that, after controlling for many individual characteristics, participation in social activities is significantly lower in more unequal and in more racially or ethnically fragmented localities. Cancela and Geys (2016) found that the majority of studies looking at the impact of minority population shares on turnout detect a negative relationship. In a recent study, Bellettini et al. (2017) found that the effect of ethnic diversity on turnout varies across income groups. In particular, they found that, for low-income individuals, ethnic diversity in the neighborhood of residence reduces the probability of voting. This negative effect becomes weaker for individuals with higher income, turning to null moving up the income ladder and positive for upper-income classes. Other measures of heterogeneity have also been used recently, such as income and educational inequalities. However, as pointed out by Cancela and Geys (2016) in their meta-analysis, the success rate of income inequality as a determinant of voter turnout is very low.

The link between past turnout and the current level of participation is considered to be derived from habit formation at the individual level, political interest, partisanship, or even as an attitude that reinforces self-image (Smets & Ham, 2013). Citizens who vote in the current election have a high probability of placing a vote in the next election. It is, therefore, possible to estimate current voter turnout using previous voter behavior (Geys, 2006a).

Regarding the effect of the economy on turnout, some studies (e.g., Schlozman & Verba, 1979; Radcliff, 1992) suggest that during economic hardship, people participate more in elections and become politically active to manifest their discontent vis-à-vis the bad economic situation. Burden and Wichowsky (2014) found

that higher unemployment rates stimulated people to vote in the presidential elections that took place over the period 1976 to 2008. At the same time, other studies postulate that voters become busier dealing with their bad economic situations and thus abstain from participating in elections. Some studies report nil overall effect where socioeconomic variables are unrelated to turnout (Blais et al., 2000; Kostadinova, 2003; Fornos et al. 2004). Empirically, Martins and Veiga (2013) identify non-linear effects of economic variables on turnout in Portuguese municipal and legislative elections.

As a social factor, religion also affects voter turnout. Stockemer and Khazaeli (2014) found that in comparison to other religious denominations, predominantly Islamic countries have lower turnout rates. However, with its 18 religious sects and multi-confessional society, the early literature on turnout in the Lebanese parliamentary elections did not detect any association between religion and the percentage of voters casting a vote. As Harik (1980) explains, the high turnout witnessed in Lebanese rural areas in elections taking place between 1962 and 1970 is due to close political and personal ties between leaders and ordinary villagers, sustained by mutual benefits and exchange of services.

The importance of the religious factor has appeared more recently. In a survey conducted in seven Arab countries –– Algeria, Morocco, Bahrain, Jordan, Lebanon, Palestine, and Yemen –– between 2006 and 2009, Miguel et al. (2015) found that different types of patronage and the distribution of benefits (*Wasta)* explain why voters turn out to vote. In Lebanon, where leaders of confessional communities rely on getting as many of their voters as possible to the polls, patronage affects mainly low-income citizens due to the intense sectarian competition and mobilization. Similar results were reported in the recent Lebanon Public Opinion Survey 2018 (LPOS, 2018), commissioned by the International Republican Institute to the Lebanese Center for Policy Studies (LCPS).

A countrywide opinion survey of 1200 respondents was conducted in the fall of 2018 to examine voter turnout and voter behavior at the 2018 Lebanese parliamentary elections following a new electoral law enacted in 2017 and based on proportional representation. Results showed that turnout rates varied significantly across sects (with Shiite having the highest participation rate), districts (highest turnout in Byblos, Keserwan, and Hermel), and country of residence (56% of registered voters among the diaspora voted in comparison to 49.7% among residents in Lebanon). Results show that voters' age, unemployment, political affiliation, and

partisanship are among the most significant determinants of turnout. According to the LPOS 2018 results, unemployed people were more likely to vote (Mourad & Garrote Sanchez, 2019).

3.3. The Lebanese setting

In this section, we explain the institutional framework and the Lebanese electoral laws before discussing the turnout rates of the parliamentary elections occurring between 1996 and 2018.

3.3.1. Institutional framework

Lebanon is a unitary parliamentary democracy whose constitution was enacted in 1926. The Lebanese territories were divided into five governorates (*Muhafazat*). Three new governorates were added as of 2017: Beirut, South Lebanon, Nabatiyeh, Mount Lebanon, North Lebanon, Akkar, Bekaa, and Baalbak-Hermel. Each governorate is then subdivided into several administrative districts (*qadas*). There are 26 administrative districts in Lebanon, all subject to the same legal and institutional framework.

The electoral districting used until 2018 were based on the eight large governorates subdivided into smaller constituencies/ electoral districts (Ekmekji, 2012). However, the electoral districts were not the same as the administrative districts, except for the 2009 parliamentary elections (see Table 28). The distribution of seats followed the administrative districting and have not changed throughout the different elections held since the end of the civil war.

Table 28 Lebanon constituencies' structures by election years

Governorate[33]		Districts / Areas	1992	1996	2000	2005	2009	2018
BEIRUT*	1	Beirut I (Areas)	Beirut	Beirut	Beirut I	Beirut I	Beirut I	Beirut I
	2	Beirut II (Areas)			Beirut II	Beirut II	Beirut II	Beirut II
	3	Beirut III (Areas)			Beirut III	Beirut III	Beirut III	
MOUNT LEBANON	4	Byblos	Byblos	Byblos	Mount I	Mount I	Byblos	Mount I
	5	Keserwan	Keserwan	Keserwan			Keserwan	
	6	Matn	Matn	Matn	Mount II	Mount II	Matn	Mount II
	7	Baabda	Baabda	Baabda	Mount III	Mount III	Baabda	Mount III
	8	Alay	Alay	Alay			Alay	Mount IV
	9	Chouf	Chouf	Chouf	Mount IV	Mount IV	Chouf	
SOUTH	10	Sidon	South and Nabatieh	South and Nabatieh	South and Nabatieh	South I Sidon Zahrany Tyre Bint-Jbeil	Sidon	South I
	11	Jezzine					Jezzine	
	12	Zahrany (Villages)					Zahrany (villages)	South II
	13	Tyre					Tyre	
NABATIEH	14	Nabatieh				Jezzine Marjeyoun Hasbaya Nabatieh	Nabatieh	South III
	15	Marjeyoun-Hasbaya					Marjeyoun-Hasbaya	
	16	Bint Jbeil					Bint Jbeil	
AKKAR (2018)	17	Akkar	North	North	North I	North I	Akkar	North I
NORTH	18	Bcharreh					Bcharreh	North III
	19	Donnieh (Area)					Minieh-Donnieh	North II
		Minieh (Area)			North II	North II		
	20	Tripoli					Tripoli	

[33] Beirut in 2000 & 2005: Beirut I: Mazraa, Achrafieh & Sayfeh areas; Beirut II: Msaytbeh, Bachoura & Rmeil areas; Beirut III: Ras Beirut, Dar Mreyseh, Marfa'(port), Meena'Hoson, Zkak Blat & Medawar areas.

Beirut in 2009: Beirut I: Achrafieh, Sayfeh & Rmeil areas; Beirut II: Medawar, Marfa'(port) and Bachoura areas; Beirut III: Mazraa, Msaytbeh, Ras Beirut, Dar Mreyseh, Meena'Hoson and Zkak Blat areas

Beirut in 2018: Beirut I: Achrafieh, Sayfeh, Medawar and Rmeil areas; Beirut II: Mazraa, Msaytbeh, Ras Beirut, Dar Mreyseh, Marfa'(port), Meena'Hoson, Zkak Blat and Bachoura areas

Table 28 (Continued)								
Governorate[34]		**Districts / Areas**	**1992**	**1996**	**2000**	**2005**	**2009**	**2018**
North	21	**Zgharta**	North	North	North II	North II	Zgharta	North III
	22	**Koura**					Koura	
	23	**Batroun**					Batroun	
BAALBEK-HERMEL (2018)	24	**Baalbek-Hermel**	Baalbek-Hermel	Bekaa	Bekaa I	Bekaa I	Baalbek-Hermel	Bekaa III
BEKAA	25	**Zahleh**	Zahleh		Bekaa II	Bekaa II	Zahleh	Bekaa I
	26	**West Bekaa-Rachaya**	West Bekaa-Rachaya		Bekaa III	Bekaa III	West Bekaa-Rachaya	Bekaa II
Total Constituencies			12	10	13	14	26	15
ELECTIONS LAWS			Law 154 22/07/1992	Law 587 13/08/1996	Law 171 06/01/2000		Law 25 08/10/2008 **Rectified** Law 59 27/12/2008	Law 44 17/06/2017

Source: (Parliament Members Election Law, 2017; Law Number 171: Modification of Parliament, Municipal and Mukhtars Electoral Law (Arabic), 2000)

[34] Beirut in 2000 & 2005: Beirut I: Mazraa, Achrafieh & Sayfeh areas; Beirut II: Msaytbeh, Bachoura & Rmeil areas; Beirut III: Ras Beirut, Dar Mreyseh, Marfa'(port), Meena'Hoson, Zkak Blat & Medawar areas.

Beirut in 2009: Beirut I: Achrafieh, Sayfeh & Rmeil areas; Beirut II: Medawar, Marfa'(port) and Bachoura areas; Beirut III: Mazraa, Msaytbeh, Ras Beirut, Dar Mreyseh, Meena'Hoson and Zkak Blat areas

Beirut in 2018: Beirut I: Achrafieh, Sayfeh, Medawar and Rmeil areas; Beirut II: Mazraa, Msaytbeh, Ras Beirut, Dar Mreyseh, Marfa'(port), Meena'Hoson, Zkak Blat and Bachoura areas

Lebanese citizens elect their representatives in parliament by direct ballot in one round, according to the electoral law in effect (The Lebanese Constitution, 1995). The electoral system used during the first five parliamentary elections that took place following the end of the civil war (1992, 1996, 2000, 2005, and 2009) was a plurality system (First-Past-The-Post FPTP). A proportional system was adopted for the 2018 elections. Candidates run for elections in a multi-seat, multi-sect constituency, and the mandate is for four years. The only exception is the last election (2018), which took place nine years after the previous one (2009).

According to the plurality system that was adopted until 2009, candidates are gathered in competing but open electoral lists balanced across sectarian lines (Salloukh et al., 2015). They can run either as independents or by the appointment of their political parties (1960 Electoral Law, 1960). The candidate contesting for a seat must be from the same confession to which the seat is allocated. Seats are won by whichever candidate from that confession gains the plurality (i.e., the highest number) of the votes cast. If there is more than one seat allocated to a confession, the seats are won by as many candidates as available seats. Voters vote in their ancestral village rather than their residential district. Regardless of their confessional affiliation, voters vote for all seats in the district in a single ballot paper. They are entitled to choose a number of candidates equal to the number of seats assigned to the constituency (Harik, 1980). They have the right to remove or add candidates from pre-arranged electoral lists, as long as the sectarian balance of the list remains the same (Salloukh et al., 2015).

In 2017, a new electoral law based on proportional representation was enacted. This electoral law gave, for the first time, the opportunity for registered Lebanese expatriates the right to vote from their country of residence.

Each voter votes for one competing list and is entitled to give his preferential vote to one candidate only in the respective administrative district. The competing list should obtain a minimum number of votes (threshold) to win seats in the parliament. This minimum is equal to the total number of voters divided by the number of seats in the district. Competing lists that do not get the threshold are excluded from the election. The threshold is counted again after excluding the total number of votes of the disqualified lists. Seats are distributed to eligible lists that gained the largest percentage of votes remaining from the first division.

Candidates in the eligible lists are sorted from first to last according to the percentage of preferential votes each candidate receives in the administrative district. The first seat is assigned to the candidate who gets the highest percentage of votes. The second-ranked candidate on the list will fill the second seat, and so on. The following two conditions should be respected when distributing seats:

- The seat should be vacant as per the distribution of seats per sect in the respective administrative district. If the seat for a specific sect has already been filled by a winning candidate and is no longer vacant, candidates running for this seat are excluded from the competition.
- If the distribution process reaches a candidate that belongs to a list that has fulfilled its quota of seats, the seat is passed on to the next eligible candidate (from another list) (Parliament Members Election Law, 2017).

Throughout all parliamentary elections, seats remained equally distributed between Christian and Muslim communities, proportionally among the confessional groups within each of the two religions, and proportionally among geographic regions.

3.3.2. Turnout from 1992-2018

Lebanon's first postwar parliamentary election took place in 1992 amid a significant opposition from many political and religious leaders calling to postpone it. The turnout rate was 30.34%, the lowest since independence. Byblos constituency witnessed the lowest turnout of 6.52% while Baalbek-Hermel the highest with 51.77%. Most of the electorate was either unconcerned or opposed to the elections. Areas with a majority of Christian electorate boycotted the elections. They objected to voting in the presence of Syrian troops (El Khazen, 1998).

The turnout in the 1996 parliamentary elections was higher than that of 1992, due to boycott weakening and the direct participation of Rafik Hariri[35] with an important electoral list in Beirut. Hariri was able to attract voters, especially the low-income residents of Beirut, by delivering handouts (Sleiman, 1998). Several factors

[35] Rafik Hariri was a Lebanese businessman who made most of his career and wealth in Saudi Arabia. He was the prime minister for 5 cabinets from 1992-1998 and from 2000-2004. Hariri participated in constructing the Taif agreement and in reconstructing the city center of Beirut at the end of the Lebanese civil war. His economic plan was mainly based on borrowing to reconstruct leading to a significant increase in the country's debt. His tenure resulted from a geopolitical agreement mainly between Saudi Arabia, Syria and the USA. His relationship with Syria deteriorated a couple of years before his assassination in February 2005.

played a role in weakening the boycott of Christians. On the one hand, some Christian leaders (Albert Moukahyber and Jean Hawwat), who were previously opposing the elections, called for mass participation in the 1996 elections. On the other hand, there was an increasing demand from the USA, France, and the Vatican to participate and not to repeat the experience of the 1992 election (Salem, 1998). On a local level, the government interfered directly and indirectly by dumping the constituencies, mainly in North Lebanon, with electoral lists and candidates (Nassif, 1998).

Despite the decrease in turnout rate from 46% in 1996 to around 43% in 2000, the latter was highly competitive. Many regional and local events happened during this period: the withdrawal of Israeli troops from the South of Lebanon, the death of the Syrian president, Hafez El Assad, and the return of former president of the Republic, Amin Gemayel from exile. Although other Christian leaders were still calling for boycotting elections, Christian voters were no longer convinced of abstaining (El Khazen, 2002). In an opinion survey conducted by Statistics Lebanon 75.52% considered voting as a national duty, while 41.97% participated in supporting a particular candidate (Shaoul, 2002).

Religious and sectarian mobilization was the common factor that characterized the 2005 parliamentary elections (Sleiman, 2007). The assassination of PM, Rafik Hariri, and the other staggering events divided the country into two camps: 14 March and 8 March (Rizk, 2007). The turnout in Beirut was low mainly because the results were known way ahead of the election day. No one doubted that the electoral list headed by the son of the late PM, Rafik Hariri, would win all seats in the district. Adding to this, nine candidates won by walkover (Gebara, 2007). In the South of Lebanon, turnout was close to 50% favoring 8 March (Atrissi, 2007). A high turnout rate was achieved in Mount Lebanon, where it varied between 62.84% (first electoral district) to 51.21% (second electoral district) (Kosseifi, 2007). In the northern district, the Sunni were highly mobilized by 14 March, while Christians, Shiite, and the Alawite voted massively and unconditionally in favor of 8 March lists except in Bcharreh, Batroun, and Koura (Doueihi, 2007).

The 2009 parliamentary elections took place after an 18-month political crisis that ended with the signing of the Doha agreement[36] in May 2008. The elections took place according to the middle size electoral districts

[36] Two years after the assassination of PM Rafik Hariri, Lebanon was deeply divided along sectarian lines between Shiite Muslims, Sunni Muslims, and Maronite Christians. Lebanon was also politically fragmented between pro-Syrian and pro-Hezbollah factions on one end of the equation and pro-western enclaves on the other end. Rival political leaders met on May 18, 2008, in Doha, Qatar, and reached the Doha agreement, which stipulated the formation of a new government and the election of a new President of the Republic. Effectively, a couple of days later, Michel Suleiman was elected President, and Fouad Siniora appointed as PM.

of the 1960 law, which liberate Christian candidates from the Muslim vote in many constituencies. Around 120,000 expatriates returned to Lebanon to vote with their travel expenses covered by political parties (approximately 80,000 were brought by 14 March and another 30,000 by 8 March) (Salloukh et al., 2015).

On 6 May 2018, Lebanon held its first parliamentary elections in nine years. A new electoral law was passed in 2017, which was based on proportional representation and allowed expatriates to vote for the first time in their country of residence. The turnout rate was 49.7% for residents and 56% for registered voters among the diaspora. The percentage of voters who are expatriates is 2.51% (46,799 out of a total 1,861,203) (United Nations Development Programme, 2018). The highest turnout rates were seen in Keserwan, Byblos, and Hermel, while the lowest were in Beirut, Tripoli, Bcharre, Zgharta, Koura, Bint Jbeil, Hasbaya, and Rachaya. Regarding the participation rate per religious affiliation, the highest turnout rate was for Shiite voters (54%) and the lowest for Armenian Catholics (26%) (Mourad & Garrote Sanchez, 2019).

Table 29 Turnout rates per districts 1992-2018

DISTRICTS / CAZAS		SEATS	1992	1996	2000	2005	2009	2018
				Voters %Share				
1	Beirut 1	19	16.28	37.64	40.35	31.28	45.18	42.93
2	Beirut 2			34.22	35.67	30.52	38.86	40.79
3	Beirut 3			31.53	32.51	21.31	29.25	34.80
4	Keserwan	5	2.22	54.48	57.37	63.97	67.62	67.09
5	Byblos	3		59.80	60.14	60.95	66.72	65.94
6	Matn	8		45.85	47.09	51.11	56.66	51.38
7	Baabda	6		44.22	42.61	53.27	55.77	48.18
8	Alay	5		48.39	48.67	56.22	51.45	50.39
9	Chouf	8		53.16	52.02	49.01	50.37	53.89
10	Sidon	2	38.08	61.65	49.99	42.23	67.58	56.71
11	Sidon Villages	3		49.74	52.19	52.02	53.64	51.88
12	Tyre	4		67.23	45.80	47.19	48.96	47.92
13	Jezzine	3		39.07	39.26	21.83	53.93	53.14
14	Bint Jbeil	3		37.60	40.50	41.27	42.87	43.62
15	Marjeyoun-Hasbaya	5		30.38	41.02	41.21	46.80	49.81
16	Nabatieh	3		62.88	52.47	55.46	56.45	55.51
17	Akkar	7	30.81	39.49	40.47	53.12	53.95	48.26
18	Bcharreh	2		26.59	23.62	36.80	37.01	39.94
19	Minieh-Donnieh	3		54.70	51.74	55.53	56.41	51.16
20	Tripoli	8		38.35	37.87	41.88	45.83	39.63
21	Zgharta	3		40.89	41.29	44.20	48.43	46.61
22	Koura	3		42.47	40.37	41.64	47.44	45.52
23	Batroun	2		46.81	40.35	52.02	56.32	55.73
24	Baalbeck-Hermel	10	46.09	61.85	45.93	51.54	49.30	60.28
25	Zahle	7		47.35	43.13	49.29	53.09	53.57
26	West Bekaa-Rachaya	6		46.66	39.55	44.23	53.26	47.44
TOTAL		**128**	**30.34**	**46.32**	**43.81**	**46.06**	**50.38**	**49.68**

Sources : Addiyar (1996); Annahar (1996**,** 1997); LADE *et al.* (2010); Ministry of Interior and Municipalities (1996, 2005, 2006, 2009, 2010, 2018); Assafir (2005a, 2005b, 2005c, 2005d); Rizk (2002); Information International (2009a, 2009b, 2009c, 2009d, 2009e).

3.4. Data and model specification

Panel data models are estimated for the 26 administrative districts in Lebanon during the parliamentary elections of 1996, 2000, 2005, 2009 and 2018.

Our empirical model is of the following form:

$$TURNOUT_{d,t} = a + bECO_{d,t} + cPOL_{d,t} + dSOCDEM_{d,t} + eINST_{d,t} + fREL^{i}_{d,t} + \varepsilon_{d,t} \quad \textbf{(4)}$$

d=1,..., 26

t=1996, 2000, 2005, 2009 and 2018

i= Sunni, Shiite, Druze, Alawite, Maronite, Greek Catholic, Greek Orthodox, Protestant Evangelical, Armenian Catholic, Armenian Orthodox, Christian Minorities, Others.

Where *d* represents the district, *t* the election year and *i* the religious sect.

The dependent variable is the percentage of registered voters that turned out to vote in district *d* in the election held in year *t*. $\varepsilon_{d,t}$ represents the error term, a, and e are parameters to be estimated, and b, c, d, and f are vectors of parameters to be estimated. The dependent variable was computed using data extracted from the Ministry of the Interior and Municipalities, and Information International.

The right-hand side of the equation includes explanatory variables that are associated with economic, political, sociodemographic, institutional, and religious factors. *ECO* is a vector of economic variables that includes:

a) *Log real income per capita*: the logarithm of real income per capita in district *d* during election year *t,* and b) *Unemployment %*: the unemployment rate in district *d* during election year *t.* The literature distinguishes between two opposite effects of the economy on turnout: A mobilization effect where people participate more in elections during economic hardships to manifest their discontent about the government's policies (Schlozman & Verba, 1979). A withdrawal effect where voters suffering from economic adversity focus more on solving their problems and improving their well-being rather than caring for politics (Rosenstone, 1982). A non-linear effect was also found where the presence and magnitude of withdrawal or mobilization effects depend on economic performance (Martins & Veiga, 2013).

Data for economic variables are extracted from the Central Administration of Statistics (CAS), except for 2000 log real income per capita, which was obtained from the World Development Indicators. The latter gives estimates at the country level and not the district level. Therefore, we considered that the geographic distribution of income (per district) is the same as previously reported by CAS,[37] and we extrapolated for the missing year using WDI figures.[38]

The vector of political variables, *POL*, includes:

a) *Past Turnout*: is the percentage of voter turnout in district *d* in the election held in year *t-4*.[39] It reflects habit formation. The link between past turnout and the current level of participation reflects political interest, partisanship, or even an attitude that reinforces self-image (Smets & Ham, 2013). It is expected to be positively associated with the current turnout percentage (Cancela & Geys, 2016).

b) *Effective Number of Parties*: is "the number of hypothetical equal-size parties that would have the same total effect on fractionalization of the system, as have the actual parties of unequal size" (Laakso & Taagepera, 1979: p.4). It proxies political fragmentation and is calculated by:

$$N_2 = \frac{1}{\sum_{i=1}^{n} p_i^2} \quad \textbf{(5)}$$

Where p_i is the fractional share of votes of party *i*. An increase in the effective number of parties is expected to be associated with a higher turnout percentage (Geys, 2006a). However, recent studies show that this relation is not very robust (Cancela & Geys, 2016).

c) *Winning margin*: is the difference in the percentage of votes between the most voted list and the second most voted list in district *d* in election year *t*. A higher winning margin is expected to be associated with a low turnout rate (Cancela & Geys, 2016).

[37] According to Ministry of Social Affairs & United Nations Development Programme (2007) and CAS (2020), the distribution of income levels per governorate did not change significantly over the years. From 1995 till 2020, the highest incomes are perceived in Beirut and Mount Lebanon, followed by the North, Bekaa and the South of Lebanon.

[38] For the year 2009, we used the figures of 2007, since no study was conducted in 2009.

[39] Except for 2005 that took place 5 after the previous election, and 2018 that occurred 9 years after the previous one.

Data regarding the share of votes of each party and voter turnout is extracted from the Ministry of Interior and Municipalities and Information International.

SOCDEM is a vector of sociodemographic variables that includes:

a) *Population*: is proxied by the logarithm of the number of registered voters in district *d* during election year *t*. It is expected that a larger population is associated with a lower turnout rate as the probability that a single vote affects the results is smaller (Geys, 2006a). Squared log number of voters will also be used to test the existence of a non-linear relationship with the turnout (Juel et al., 2014).

b) *School Enrollment %*: is the school enrollment rate in district *d* during election year *t* and is expected to be positively correlated with the turnout. According to Blais (2000), higher education is linked to more participation in elections. Martins & Veiga (2013) used the percentage of the population employed in the tertiary sector as a measure of education and found that turnout in municipal elections falls concurrently with a more significant percentage of workers employed in the tertiary sector. Given these contradictory results, we do not have prior expectations regarding the effect of school enrollment on the turnout rate.

Data for the number of registered voters is extracted from the Ministry of Interior and Municipalities and the Lebanese Center for Policy Studies. The school enrollment rate is extracted from the CAS.

As for the vector of *Religious* variables: it includes the share of voters belonging to the religious sect *i* in district *d* during election year *t*. We will use these variables as a proxy for religious homogeneity. Data is extracted from the Ministry of Interior and Municipalities and from Information International.

One institutional variable has been used in our model, which is the *proportional system*. This variable takes the value of one for the proportional electoral system and zero for the plurality electoral system. The parliamentary elections of 1996, 2000, 2005, and 2009 were conducted under a plurality system (First-Past-The-Vote) and the 2018 elections under a proportional system.

Descriptive statistics for the variables used in the empirical model are reported in Table 30. Turnout was, on average, 47.5%, with the lowest rate of 21.3% and the highest of 67.6%. Regarding economic variables, the average unemployment rate is 8.97 %. It reached a maximum of 17.8% in a specific district/year, but did not go below 4.3%. Real per capita income (2010 constant USD) varies between 1,728 USD and 13,341 USD.

As for sociodemographic variables, population size varied between 9,798 and 190,268 persons/district, and the school enrollment rate was 88.8% on average with a maximum of 99.3% and a minimum of 61%.

Regarding political variables, the winning margin was, on average, 35.3%. The winning margin reached a maximum of 96.3% and a minimum of 0.017%. The effective number of parties was, on average, 3.06. In some districts, it reached one while in other districts, it reached a maximum of 8.205. On average, past turnout is 43.4%, with a minimum of 6.52% and a maximum of 67.6%.

When religious affiliation is taken into consideration, we notice the following distribution of voters: 23.8% Shiite sect; 23.7% Sunni sect; 28% Christian Maronite; 8.55% Greek Orthodox; 4.99% Druze; 4.98% Greek Catholic; 2% Armenian Orthodox; 1.48% Christian minorities; 0.591% Armenian Catholic; 0.519% belong to other religious sects; 0.487% Muslim Alawite; and 0.363% Protestant Evangelical.

Table 30 Descriptive statistics

VARIABLES	(1) N	(2) mean	(3) Sd	(4) min	(5) Max	(6) Sources
Turnout in district	130	0.475	0.0958	0.213	0.676	Addiyar (1996); Annahar (1996, 1997); Inf.Int. (2009a; 2009b; 2009c; 2009d; 2009e); MOIM (1996; 2005; 2006; 2009; 2010; 2018); Rizk (2002); LEDA *et al.* (2010) ; Lebanese Association for Democratic Elections (2014)
Economic variables						
Unemployment % in district	130	0.0897	0.0271	0.0430	0.178	(Central Administration of Statistics, 1996, 1997c, 1997a, 2000); (Central Administration of Statistics *et al.*, 2008); (Central Administration of Statistics *et al.,* 2020*)*; CAS and UNICEF (2010); MOSA and UNDP (2007); UNDP (2008); World Bank (2019)
Real income per capita (constant 2010 USD)	130	5,721	3,133	1,728	13,341	
Sociodemographic variables						
School Enrollment %	130	0.888	0.110	0.610	0.993	(Central Administration of Statistics, 1996, 1997b, 1997a, 2000, 2005) (Central Administration of Statistics *et al.*, 2008); (Central Administration of Statistics *et al.,* 2020*)*; MOIM (1996; 2005; 2006; 2009; 2010; 2018)
Population	130	55,702	28,789	9,798	190,268	
Political variables						
Winning Margin	128	0.353	0.280	0.00170	0.963	Addiyar (1996); Annahar (1996, 1997); Inf.Int. (2009a, 2009b, 2009c, 2009d, 2009e); MOIM (1996, 2005, 2006, 2009, 2010, 2018); Rizk (2002); LEDA *et al.* (2010) ; Lebanese Association for Democratic Elections (2014)
Effective Number of Parties	128	3.060	1.481	1	8.205	
Actual Number of Parties	130	5.238	2.676	1	12	
Past Turnout	130	0.434	0.121	0.0652	0.676	

Table 30 (Continued)

VARIABLES	(1) N	(2) mean	(3) Sd	(4) min	(5) Max	(6) Sources
Institutional variable						
Proportional System	130	0.200	0.402	0	1	Lebanese Parliament (2017)
Religious variables						
% of Sunni voters	130	0.237	0.272	0.000409	0.853	Inf.Int. (2009a; 2009b; 2009c; 2009d;
% of Shiite voters	130	0.238	0.306	0	0.952	2009e);
% of Druze voters	130	0.0499	0.117	0	0.539	MOIM (1996; 2005; 2006; 2009; 2010;
% of Alawite voters	130	0.00487	0.0157	0	0.0776	2018);
% of Maronite voters	130	0.280	0.294	0.0143	0.991	
% of Greek Catholic voters	130	0.0498	0.0473	0.000586	0.201	
% of Greek Orthodox voters	130	0.0855	0.120	3.24e-05	0.646	
% of Protestant Evangelical voters	130	0.00363	0.00306	0	0.0129	
% of Armenian Catholic voters	130	0.00591	0.0113	0	0.0592	
% of Armenian Orthodox voters	130	0.0250	0.0521	0	0.268	
% of Christian minorities voters	130	0.0148	0.0216	8.10e-06	0.107	
% of Others voters	130	0.00519	0.00747	8.16e-06	0.0494	
Religious Fragmentation	130	2.563	1.315	1.018	6.195	

3.5. Empirical results

We started by estimating the empirical model presented in equation 4 by Ordinary Least Squares (OLS) (Gallego et al., 2012; Garmann, 2014; Paola & Scoppa, 2014). After checking for multicollinearity problems, we get large values of the Variance Inflation Factor (VIF)[40] for Shiite, log real income per capita, Protestant Evangelical, Sunni, Maronite, and Others. The exclusion of these covariates with large VIFs leads to results reported in column 1 of Table 31, with robust t-statistic and standard errors clustered by districts. The analysis of the results shows that past turnout, log population, unemployment, the winning margin, the % of Druze, Alawite, Armenian Orthodox, and Christian minorities' voters are statistically significant in explaining turnout.

Next, we controlled for election year fixed-effects by adding dummies for all election years except the first one. The proportional system is automatically excluded. Similar results to the OLS (column 1 Table 31) were obtained. Results are reported in column 2.

Other estimation methods can be considered. The Random-Effects (RE) estimation method and the Fixed-Effects (FE) model. The first makes use of within- and between-country variances, allowing the estimation of effects for time-invariant variables, and the latter controls for all time-invariant differences between the individuals. To choose between a RE model and a FE model, we implemented a Hausman test, which indicated that the FE model is preferable, since the Chi-Square is 97.88, and the p-value is < 0.05. We, therefore, rejected the null hypothesis indicating a correlation between the unique errors and the regressors and confirming the advantage of the FE strategy. Results of the FE model with time dummies are reported in column 3. Noting that the religious variables have been excluded from the FE model as their variability is very small across years.

Since our model is dynamic depending on its past realizations and given the few periods and many individuals, and the presence of independent variables that are not strictly exogenous, the OLS and FE results are biased and inconsistent. Dynamic panel estimators such as the difference-GMM of Arrelano and Bond (1991) and the system-GMM of Arrelano-Bover (1995) and Blundell- Bond (1998) can be used to deal with these problems. In column 4, we estimate our model using the system-GMM estimator with a two-step approach, which allows the introduction of more instruments and improves efficiency (Roodman, 2009).

[40] VIF for Shiite: 13595.87, Log real income per capita: 12543.17, Protestant Evangelical: 2122.22, Others: 1993.30, , Maronite: 5.48 and Sunni: 5.43

Besides the lagged dependent variable, the winning margin has been considered as an endogenous variable. Time dummies have been included in the model as they are jointly statistically significant. The instruments[41] have been collapsed. We also report the results of the Hansen test which does not reject the validity of over-identifying restrictions. As for the autocorrelation of the second-order, it is rejected.

The analysis of the results in column 4 suggests that voters tend to have habit formation where past turnout (lagged dependent variable) is statistically significant and positively signed. A one percentage point increase in past turnout increases participation in elections by 0.281 percentage points. The result is statistically significant at 5% level of significance. The winning margin is another political variable that exhibits statistically significant results where a one percentage point increase in the winning margin lowers turnout by 0.124 percentage points. The result is in line with previous empirical findings.

Regarding sociodemographic variables, only log population is statistically significant. If the population increases by 1%, the turnout increases by 7.4 percentage points.

Unemployment is the only economic variable that was maintained in this model and is statistically significant. It is negatively correlated to turnout and is consistent with the withdrawal effect where voters respond to economic hardships by paying less attention to politics. A one percentage point increase in unemployment lowers the turnout by 0.858 percentage points. The result is statistically significant at 5% level of significance.

We will refer to the model estimated in column 4 as the main model and the system-GMM as the main estimation strategy for the remainder of this chapter.

[41] For the endogenous variables, we used lags 2 and longer for the transformed equation and lag 1 for the levels equation. As for the strictly exogenous regressors considered as instruments, we use the current lag.

Table 31 Baseline model with OLS, OLS with time dummies, FE with time dummies, and system-GMM with time dummies

VARIABLES	(1) OLS	(2) OLS with time dummies	(3) FE	(4) System-GMM
Past turnout	**0.229*** **	**0.366*** **	**0.067***	**0.281** **
	(0.069)	**(0.085)**	**(0.035)**	**(0.132)**
Effective Number of Parties	-0.007	-0.007	0.002	-0.010
	(0.004)	(0.005)	(0.002)	(0.009)
Winning Margin	**-0.129*** **	**-0.121*** **	**-0.026** **	**-0.124***
	(0.022)	**(0.023)**	**(0.011)**	**(0.072)**
Log population	**0.091*** **	**0.083*** **	**0.386*** **	**0.074** **
	(0.018)	**(0.018)**	**(0.030)**	**(0.027)**
School Enrollment	0.033	-0.051	**-0.161*** **	-0.266
	(0.060)	(0.127)	**(0.038)**	(0.197)
Unemployment	**-0.880*** **	**-0.871*** **	**0.027**	**-0.858** **
	(0.255)	**(0.252)**	**(0.142)**	**(0.351)**
Proportional System	0.002			
	(0.018)			
% of Druze voters	**-0.119** **	**-0.099** **		
	(0.054)	**(0.049)**		
% of Alawite voters	**-2.032*** **	**-1.848*** **		
	(0.440)	**(0.445)**		
% of Greek Catholic voters	0.102	0.048		
	(0.105)	(0.117)		
% of Greek Orthodox voters	-0.034	-0.028		
	(0.039)	(0.039)		
% of Armenian Orthodox voters	**-0.404*** **	**-0.344*** **		
	(0.121)	**(0.113)**		
% of Christian Minorities voters	**-1.052*** **	**-0.783** **		
	(0.366)	**(0.368)**		
1996 election		-0.082***	-0.070***	0.075**
		(0.022)	(0.010)	(0.029)
2005 election		-0.039	-0.062***	0.090*
		(0.030)	(0.014)	(0.047)
2009 election		-0.033	-0.082***	0.106*
		(0.035)	(0.018)	(0.058)
2018 election		-0.038	-0.144***	0.102*
		(0.038)	(0.026)	(0.051)
Observations	128	128	128	128
R-squared	0.612	0.665	0.843	

Table 31 (continued)				
Number of Instruments	.	.	.	18
AR(1) p-value	.	.	.	0.0149
AR(2) p-value	.	.	.	0.101
Hansen p-value	.	.	.	0.375
Number of districts			26	26

Note: The dependent variable is voter turnout as a percentage of registered voters. The estimation method in column 1 is OLS excluding large VIFs, OLS with year dummies excluding large VIFs in column 2, FE with time dummies excluding religious variables in column 3, and system-GMM with time dummies excluding religious variables in column 4. All models include a constant term. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

We also tested for non-linear relationships between log population and turnout on one hand, and unemployment and turnout on the other hand. In Table 32, we estimate the non-linearities of unemployment (column 1) and log population (column 2) by adding their quadratic term to the list of explanatory variables of the main model. However, no statistically significant results were found for the two new variables introduced in the model.

Table 32 Testing non-linearities of unemployment and log population

	(1)	(2)
VARIABLES	**Squared unemployment**	**Squared log population**
Past turnout	0.349**	0.242*
	(0.144)	(0.121)
Effective Number of Parties	-0.010	-0.009
	(0.009)	(0.009)
Winning Margin	-0.099	-0.105
	(0.069)	(0.071)
Log population	**0.071****	**0.637**
	(0.028)	**(0.413)**
Squared log population		**-0.027**
		(0.020)
School Enrollment	-0.305	-0.260
	(0.216)	(0.190)
Unemployment	**-3.464**	**-0.861****
	(2.153)	**(0.342)**
Squared Unemployment	**13.249**	
	(10.670)	
1996 election	-0.015	0.071**
	(0.069)	(0.028)
2000 election	-0.104*	
	(0.058)	
2005 election	-0.008	0.085*

Table 32 (Continued)

	(0.018)	(0.045)
2009 election		0.105*
		(0.056)
2018 election	-0.003	0.107**
	(0.022)	(0.047)
Observations	128	128
Number of districts	26	26
Number of instruments	19	19
AR(1) p-value	0.00807	0.0211
AR(2) p-value	0.0902	0.166
Hansen p-value	0.105	0.342

Note: The dependent variable is voter turnout as a percentage of registered voters. In column 1, we add the quadratic term of unemployment, and in column 2, the quadratic term of log population. All models include a constant term. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

3.5.1. Robustness checks

Two robustness checks were applied. First, we estimated our main model with two alternative estimation methods: Fractional Probit and Beta regression. These two methods are used in the literature when the dependent variable is a fractional response (Paola & Scoppa, 2014; Veiga & Veiga, 2018). They capture particular non-linear relationships, especially when the outcome variable is near 0 or 1.

The estimation results using the Beta regression and the Fractional Probit models are reported in Table 33. Beta regression and Fractional Probit methods generate very similar results in terms of estimated coefficients and statistical significance levels. The estimations obtained with these two methods are similar to those of the system-GMM in terms of the statistically significant variables. Except for the Effective Number of Parties which appears now to be significant.

Table 33 Main model using Beta Regression and Fractional Probit with district dummies

VARIABLES	(1) Fractional Probit	(2) Marginal effects FP	(3) Beta regression	(4) Marginal effects BR
Past turnout	**1.389*** **	**0.553*** **	**2.238*** **	**0.558*** **
	(6.664)	**(6.674)**	**(8.933)**	**(8.934)**
Effective Number of Parties	**-0.0234***	**-0.00934***	**-0.0370** **	**-0.00923** **
	(-1.727)	**(-1.726)**	**(-1.992)**	**(-1.992)**
Winning Margin	**-0.195*** **	**-0.0777*** **	**-0.310*** **	**-0.0773*** **
	(-3.483)	**(-3.483)**	**(-3.432)**	**(-3.432)**
Log Population	**0.112*** **	**0.0448*** **	**0.181*** **	**0.0451*** **
	(2.994)	**(2.994)**	**(3.394)**	**(3.394)**
School Enrollment	-0.226	-0.0901	-0.311	-0.0776
	(-0.594)	(-0.594)	(-0.531)	(-0.531)
Unemployment	**-2.279*** **	**-0.908*** **	**-3.655*** **	**-0.912*** **
	(-3.089)	**(-3.088)**	**(-2.894)**	**(-2.894)**
2000 election	-0.289***	-0.114***	-0.457***	-0.113***
	(-4.999)	(-5.011)	(-5.437)	(-5.505)
2005 election	-0.135	-0.0539	-0.227*	-0.0568*
	(-1.499)	(-1.501)	(-1.784)	(-1.788)
2009 election	-0.102	-0.0405	-0.174	-0.0434
	(-1.022)	(-1.023)	(-1.240)	(-1.241)
2018 election	-0.110	-0.0437	-0.186	-0.0464
	(-0.984)	(-0.985)	(-1.137)	(-1.138)
Observations		128		128

Note: The dependent variable is the percentage of registered voters who turned out to vote. The estimation method is Fractional Probit in column 1 and Beta Regression in column 3. The marginal effects are reported in columns 2 and 4, respectively. All models include and a constant term. Robust z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Second, we exclude 2018 from the analysis. This election is particular due to many factors, including its timing nine years after the previous one, and the adoption of a new electoral system (a proportional one). Similar results to those of the system-GMM baseline model were obtained in terms of statistically significant covariates.

3.6. Religious fragmentation

The religious factors have proven to be strong predictors of parties' vote share as seen in chapter 2. However, the low variability of the percentage of voters belonging to each religious sect did not allow us to estimate efficiently their effect on turnout. To overcome this weakness, we referred to two alternatives proxies of the

religious factor. First, we calculated the religious fragmentation by referring to equation 5 and replacing the fractional share of votes of party i with the fractional share of the number of voters belonging to confession i (r_i).

$$N_2 = \frac{1}{\sum_{i=1}^{n} r_i^2} \qquad (6)$$

This variable was added to the main model (column 4 Table 31) and the results are reported in column 1 of Table 34. The new variable is statistically significant and negatively signed. It shows that a one percentage point increase in religious fragmentation lowers the probability of turnout by 0.035 percentage points. The result is statistically significant at a 1% level of significance and is in line with the findings of Garrote Sanchez (2021). The latter showed that municipalities with a higher level of sectarian fragmentation had lower turnout rates than those who are more confessionally homogenous during the 2018 parliamentary elections. However, when we add this variable, the lagged dependent variable loses its statistical significance.

Second, we added the share of Christian voters as a percentage of total voters to the main model. The results are reported in column 2. However, no statistically result was found for this variable. A similar analysis was conducted with the share of Muslim voters and similar results were obtained.

Table 34 Religious fragmentation, Christian voters and Muslim voters

	(1)	(2)	(3)
VARIABLES	**Religious Fragmentation**	**Share of Christians**	**Share of Muslims**
Past turnout	0.181	0.306**	0.307**
	(0.142)	(0.123)	(0.125)
Winning Margin	-0.201***	-0.101	-0.102
	(0.058)	(0.078)	(0.079)
Effective Number of Parties	-0.003	-0.010	-0.009
	(0.006)	(0.008)	(0.008)
Log Population	0.111***	0.082**	0.081**
	(0.024)	(0.030)	(0.030)
School Enrollment	-0.209	-0.291	-0.290
	(0.165)	(0.189)	(0.190)
Unemployment	-0.644*	-0.797**	-0.802**
	(0.354)	(0.348)	(0.350)
Religious Fragmentation	**-0.035*** **		

Table 34 (Continued)

	(0.011)		
Christians		0.045	
		(0.061)	
Muslims			-0.042
			(0.062)
1996 election	0.052*	0.084***	0.084***
	(0.030)	(0.028)	(0.028)
2005 election	0.070	0.095**	0.095**
	(0.044)	(0.045)	(0.045)
2009 election	0.071	0.110*	0.111*
	(0.053)	(0.055)	(0.056)
2018 election	0.058	0.105**	0.105**
	(0.051)	(0.050)	(0.050)
Observations	128	128	128
Number of instruments	19	19	19
AR(1) p-value	0.0198	0.0184	0.0179
AR(2) p-value	0.0585	0.175	0.169
Hansen p-value	0.430	0.473	0.463

Note: The dependent variable is voter turnout as a percentage of registered voters. The estimation method is system-GMM. The model includes a constant term. Religious fragmentation was added to the model in column 1. The share of Christians was added to the model in column 2. The share of Muslim voters was added to the model in column 3. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

3.7. Conclusion

This chapter records the first attempt to test the effects of different economic, sociodemographic, institutional, and political factors on the turnout rates in 26 administrative districts during the 1996, 2000, 2005, 2009, and 2018 Lebanese parliamentary elections. Despite some data limitations, where some variables are only available at the national level rather than the district one, this chapter sheds light on interesting empirical findings.

Different estimation methods were applied (OLS, FE, Beta regression, and Fractional Probit). However, the system-GMM is the primary estimation method on which the remainder of the paper was based. The system-GMM main model included: one economic variable (unemployment %); political variables (past turnout, the effective number of parties, and the winning margin); and sociodemographic variables (school enrollment %, and log population).

Our results suggest that Lebanese voters consider political factors when participating in elections in the same way as voters from other countries do. They tend to exhibit habit formation and they participate more when the margin of votes between competing parties is small. As for the effects of the economy on the probability of turnout, our results suggest that the worsening of the economic conditions discourages Lebanese voters from participating in elections. These results are in line with the withdrawal effect where voters put more attention on their well-being rather than politics. However, opposite results to the literature were found regarding the effects of sociodemographic factors. While previous studies found that voters turn less to the polls when the size of the population increases, the results of this chapter suggest that in more populated districts, more polling stations exist, and thus it is easier to vote.

The religious factor remains an important variable to be considered when talking about elections in Lebanon mainly when referring to the religious fragmentation variable.

CONCLUSION

This thesis has been organized into three independent papers on the subject of political economy. In the first paper, we studied the determinants of successful revolutions in a large dataset of countries, before restricting our analysis, in the second and third papers, to voter behavior and turnout in a single country, Lebanon.

The first paper, Chapter 1, empirically investigated the impact of the economy, governance, information and communications technology (ICT), and media censorship, among other factors, on the probability of successful revolution in more than 150 countries over the 1996-2015 period. We considered successful revolutions as processes leading to a leader's exit from the office, based on large-scale popular participation. Forty-seven successful revolutions broke out during the period under study.

Chapter 1 reevaluated some factors previously mentioned in the literature and investigated new ones. There is evidence that economic performance, mainly income per capita and income growth, reduces the likelihood of successful revolutions. Some variables that have surfaced with the recent Arab uprisings reported statistically significant effects. Such factors are mainly related to media censorship, governance, and ICT. An increase in media censorship increases the probability of successful revolutions; concerning governance and ICT indicators, their increase lowers the probability of successful revolutions. On the other hand, democracy reported statistically significant results only when interacted with income level and income growth. We found that income per capita reduces the probability of successful revolutions only in democratic countries. The effect of the 5-years average rate of real GDP growth on the likelihood of successful revolutions is of concern only in non-democratic countries. There was also evidence that oil income can lower the probability of successful revolutions, particularly in non-democratic countries.

In general, this chapter's findings lead to relevant recommendations, particularly concerning economic policies that stimulate medium-term economic growth, and hence higher income levels, especially in non-democratic countries. Such policies can lower the probability that governments will face successful revolutions, making them less prone to different types of political violence, such as violence against the government, demonstrations and riots, revolutionary wars, and successful coups d'état.

This paper did not show a direct effect of the regime type; this does not necessarily call into question the promotion of democracy. Instead, more democratization might be needed to promote good governance, dismantle cronyism and clientelism, control corruption, and improve regulatory quality and the rule of law – – all of which are peace-promoting. Governments are called to complement such policies by lowering media censorship. Less regime control over the press, coupled with more developed information and communications technology, enables citizens to better communicate their opinions and discontent about the government, which might avoid the need to resort to the street.

Like any other paper on this topic, the small number of successful revolutions analyzed is a limitation. The use of alternative datasets and different definitions of revolutions might mitigate this problem, in addition to considering a more extended period.

The second paper, Chapter 2, narrowed the analysis to a particular Arab country, Lebanon. It examined the effects of religious, socio-economic, and political variables on party choice in Lebanon. The research was applied to six political parties and independent candidates in 1996, 2000, 2005, and 2009 parliamentary elections.

As one would expect, in a multi-confessional and diverse society such as Lebanon, religious factors are strong predictors of parties' vote shares. The percentage of voters belonging to specific religious sects is particularly relevant for explaining the Amal Movement's vote share, the Hezbollah, the Progressive Socialist Party, and the Independents of the March 14 coalition. Despite the importance of religious factors, socio-economic variables also explain Lebanese parties' vote shares. There is evidence that the economy, namely income per capita, positively influences the vote share of the Hezbollah and the Future Movement and negatively that of Independents. The economy also plays a role in the Syrian Social Nationalist Party's vote shares, where higher unemployment is associated with lower vote shares. Finally, more developed districts, with better access to water, vote more for the Progressive Socialist Party.

A richer model for our analysis is that of the Independents, who are penalized in districts that witness more bombings and assassinations. There is also evidence that Independents benefit when the number of ministers is high.

The third paper, Chapter 3, is the first to investigate economic, sociodemographic, institutional, and political factors on the turnout rates in 26 administrative districts during 1996, 2000, 2005, 2009, and 2018 Lebanese parliamentary elections. Despite some data limitations (some variables are only available at the national level rather than at the district level), this chapter sheds light on interesting empirical findings.

The results revealed that the economy affects the probability of voters turning out to the polls. Lebanese voters participate less in elections when the economic conditions are worsening. Political and sociodemographic factors also matter to Lebanese voters. There is evidence of habit formation and more interest in voting when the competition among leading political parties is high. Furthermore, sociodemographic factors seem to affect participation in elections. Namely, more populated districts with more polling stations witness higher participation in elections.

Results of both Chapters 2 and 3 suggested that the economy matters to the Lebanese voters when deciding whether to vote or not, but it matters less when deciding on the party to which they want to cast their vote.

The effects of the economy on the decision to participate in elections corroborate with the withdrawal effect where the economically-stressed Lebanese voters do not vote because they are too preoccupied to pay attention to politics. They also withdraw from politics believing that their participation is worthless as it has never succeeded in impacting the government's economic policies, especially during hardships.

However, when deciding on the party to which they want to cast their vote, Lebanese voters underestimate the economy. Such behavior is not surprising in such a diverse society, where sectarian affiliation affects Lebanese voter behavior. The Lebanese political system, in place since the Taif agreement, was and is still characterized by a consociational democracy (Horn, 2008) where sectarian elites control the political scene. The electoral laws and electoral districting adopted since the end of the civil war contributed to reinforcing this political sectarianism.

The phasing out of such political sectarianism requires a more decentralized electoral districting, a federal one, where voters participate in elections to express their satisfaction/dissatisfaction with the economic performance rather than withdrawing. They choose their representatives based on economic considerations rather than their religious affiliation. Smaller and more religiously homogenous constituencies contribute to

shifting voter's priorities from preserving and defending their sects to improving their well-being through more economic development in their districts.

Optimally, the government is called to implement a secular system. However, this is a long process that starts with a rethinking of the educational system. Future generations should be raised to become more tolerant of their societies' differences and prioritize their nation's interest over their religious affiliation.

In October 2019, a planned increase in gasoline, tobacco, and WhatsApp taxes triggered nationwide protests in Lebanon against the ruling elite for their failure to provide for the population's basic needs. Today, more than one year after the so-called October revolution, the same ruling elite that governed the country since the end of the civil war is still in power. The economy is suffocating. Lebanon is thrust into its worst economic crisis in decades, with its currency collapsing, businesses shutting down, and prices skyrocketing with a three-digit inflation rate.

For a long time, the Lebanese people were passive and sedentary and did not believe that a change was possible. Will this *status quo* change? Recent events have proved that the economy has not been able to trigger a successful revolution. Will the change come through other methods, such as participating more in the next parliamentary elections and changing the voting behavior?

Future research would be essential to investigate further the socio-economic and cultural differences at a more disaggregated constituency level, like municipalities. This would contribute to a better understanding of the voting behavior and turnout of Lebanese voters.

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APPENDIX A: APPENDICES TO CHAPTER 1

A 1 List of successful revolutions 1996-2015

Country	Leader	Start date	End date	Entry	Exit	Description
Bangladesh	Iajuddin	2006	1/12/2007	Regular	Irregular	Popular Protest, without Foreign Support
Burundi	Ntibantunganya	2/1994	7/25/1996	Regular	Irregular	Removed by Other Government Actors, without Foreign Support
Cameron	Ranariddh	1993	7/6/1997	Regular	Irregular	Removed by Other Government Actors, without Foreign Support
Ivory Coast	Konan Bedie	1993	25/12/1999	Regular	Irregular	Removed by Military, without Foreign Support
Ivory Coast	Guei	1999	25/10/2000	Irregular	Irregular	Popular Protest, without Foreign Support
Central African Republic	Patasse	1993	3/15/2003	Regular	Irregular	Removed by Rebels, without Foreign Support
Central African Republic	Francois Bozize	2003	3/24/2013	Regular	Irregular	Removed by Rebels, without Foreign Support
Comoros	Massounde	1998	4/30/1999	Regular	Irregular	Removed by Military, without Foreign Support
Democratic Republic of Congo	Mobutu	1965	5/16/1997	Irregular	Irregular	Removed by Rebels, without Foreign Support
Democratic Republic of Congo	Laurent Kabila	1997	1/16/2001	Irregular	Irregular	Removed by Military, without Foreign Support
Ecuador	Mahuad	1998	1/21/2000	Regular	Irregular	Popular Protest, without Foreign Support
Egypt	Mubarak	1981	2/11/2011	Regular	Irregular	Popular Protest, without Foreign Support
Egypt	Morsi	2012	7/3/2013	Regular	Irregular	Popular Protest, without Foreign Support
Fiji	Chaudhry	1999	5/19/2000	Regular	Irregular	Removed by Rebels, without Foreign Support
Fiji	Bainimarama	2/2000	7/14/2000	Irregular	Irregular	Removed by Other Government Actors, without Foreign Support
Fiji	Laisenia Qarase	3/2000	12/5/2006	Regular	Irregular	Removed by Military, without Foreign Support
Guinea Bissau	Vieira	1980	5/7/1999	Irregular	Irregular	Removed by Military, without Foreign Support
Guinea Bissau	Kumba Iala	2000	9/14/2003	Regular	Irregular	Removed by Military, without Foreign Support

A 1 (Continued)

Country	Leader	Start date	End date	Entry	Exit	Description
Guinea Bissau	Vieira	2005	3/2/2009	Regular	Irregular	Removed by Military, without Foreign Support
Guinea Bissau	Raimundo Pereira	1-2012	4/12/2012	Regular	Irregular	Removed by Military, without Foreign Support
Georgia	Shevardnadze	2-1992	23/11/2003	Regular	Irregular	Popular Protest, without Foreign Support
Georgia	Saakashvili	2004	25/11/2007	Regular	Irregular	Popular Protest, without Foreign Support
Guinea	Dadis Camara	2-2008	12/5/2009	Irregular	Irregular	Removed by Military, without Foreign Support
Honduras	Zelaya	2006	6/28/2009	Regular	Irregular	Removed by Military, without Foreign Support
Kyrgystan	Akayev	1990	3/25/2005	Regular	Irregular	Popular Protest, without Foreign Support
Kyrgystan	Bakiyev	2005	4/7/2010	Regular	Irregular	Popular Protest, without Foreign Support
Lebanon	Siniora	2007	5/25/2008	Regular	Irregular	Removed by Military, without Foreign Support
Mauritania	Sidi Ahmed Taya	1984	8/3/2005	Irregular	Irregular	Removed by Military, without Foreign Support
Mauritania	Ould Cheikh Abdellahi	2007	8/6/2008	Regular	Irregular	Removed by Military, without Foreign Support
Madagascar	Ratsiraka	1997	7/6/2002	Regular	Irregular	Removed by Other Government Actors, without Foreign Support
Madagascar	Marc Ravalomanana	2002	3/17/2009	Irregular	Irregular	Removed by Military, without Foreign Support
Mali	Amadou Toure	2002	3/22/2012	Regular	Irregular	Removed by Military, without Foreign Support
Nepal	Gyanendra	2005	4/30/2006	Regular	Irregular	Popular Protest, without Foreign Support
Niger	Ousmane	1993	1/27/1996	Regular	Irregular	Removed by Military, without Foreign Support
Niger	Mainassara	1996	4/11/1999	Irregular	Irregular	Removed by Military, without Foreign Support
Niger	Mamadou Tandja	2/1992	2/8/2010	Regular	Irregular	Removed by Military, without Foreign Support
Pakistan	Benazir Bhutto	1993	11/5/1996	Regular	Irregular	Removed by Other Government Actors, without Foreign Support
Pakistan	Sharif	1997	12/10/1999	Regular	Irregular	Removed by Military, without Foreign Support

A 1 (Continued)

Country	Leader	Start date	End date	Entry	Exit	Description
Sierra Leone	Strasser	1992	1/17/1996	Irregular	Irregular	Removed by Military, without Foreign Support
Sierra Leone	Kabbah	2/1996	5/25/1997	Regular	Irregular	Removed by Military, without Foreign Support
Solomon Islands	Ulufa'alu	1997	6/5/2000	Regular	Irregular	Removed by Rebels, without Foreign Support
Solomon Islands	Rini	1/2006	5/4/2006	Regular	Irregular	Popular Protest, without Foreign Support
Thailand	Thaksin Shinawatra	2001	9/19/2006	Regular	Irregular	Removed by Military, without Foreign Support
Thailand	Niwattumrong Boonsongpaisan	12014	5/22/2014	Regular	Irregular	Removed by Military, without Foreign Support
Tunisia	Zine Al-Abidine Ben Ali	1987	1/14/2011	Irregular	Irregular	Popular Protest, without Foreign Support
Turkey	Erbakan	2/1996	6/30/1997	Regular	Irregular	Removed by Military, without Foreign Support

Source: Goemans et al. (2016a).

A 2 List of civil violence events 1996-2015

Country	Year start	Year end	Description
Albania	1997	1997	Civil violence (Pyramid Schemes)
Indonesia	1998	1998	Civil violence (ouster of Suharto)
Indonesia	1999	1999	Ethnic violence (East Timor independence)
Guinea	2000	2001	Parrot's Beak clashes
Liberia	2000	2003	Civil violence (attacks by LURD guerillas)
Central African Rep.	2001	2003	Civil violence (attacks by Bozize loyalists; coup)
India	2001	2016+	Maoist insurgency (People's War Group; Maoist Communist Centre; People's Liberation Guerrilla Army)
Congo-Brazzaville	2002	2003	Civil violence (Ninja militants in Pool region)
Thailand	2003		Anti-Drug Traffiking Campaign
Saudi Arabia	2003	2007	Islamic Militants
Haiti	2004	2007	General unrest surrounding ouster of President Aristide and his Lavalas Family ruling party
Mexico	2006	2016+	Federal Army and police offensive against entrenched drug cartels and corrupt police and officials, mainly in the northern region bordering the USA
Egypt	2011	2011	Popular protests against Mubarak regime
Yemen	2011	2014	Anti-Saleh demonstrations, southern separatists, army mutiny, clan rivalry, and al Qaeda militants
Mali	2012	2016+	Islamist Ansar Dine and ethnic-Tuareg "Azawad" separatists
Egypt	2013	2016+	Military ouster of President Morsi and crackdown on Muslim Brotherhood; Islamist rebellion in Sinai and south
Burundi	2015	2016+	Government forces target opposition in dispute over President Nkurunziza's "election" to a third term

Source: (Marshall, 2017a)

A 3 List of revolutionary wars 1996-2015

Country	Begin	End	Description
Afghanistan	2001	ongoing	Following the al Qaeda attacks on the United States on 11 September 2001, the Taliban regime voices its support for maintaining al Qaeda bases in Afghanistan. The US provides massive air support for Northern Alliance forces beginning in October 2001 and quickly ousts the Taliban. Taliban and nationalist Mujahadeen rebels engage in armed combat against the new regime and International Security Assistance Forces led by the US.
Albania	1997	1997	Collapse of pyramid investment schemes plunges country into chaos and anarchy. Protesters demand resignation of President Berisha. Government loses all control of police and military; capital and southern half of country engulfed in fighting, looting and rioting. Tension is defused when Berisha resigns and new elections are called.
Chad	2005	2010	Dominance of the central government by President Déby's clan and ethnic-Zaghawa supporters led to a mutiny by elements of the army in October 2005, a coup attempt in March 2006, and an attack on the capital in April 2006. Failing to unseat the government, FUC rebel forces took refuge in border regions with Sudan and Central African Republic. A peace agreement with the rebels was reached in December 2006 and fighting largely ended in January 2007. The agreement quickly broke down and fighting resumed in areas bordering the Sudan; this round included a split in Déby's support base. A second attack on the capital was mounted in February 2008 but this attack also failed to unseat the Déby government. An agreement was reached between Chad and Sudan in late 2009 to normalize relations and cooperate in increasing security along their mutual border; armed clashes subsequently have diminished.
Congo-Brazzville	1997	1999	Civil war erupts in June amid heavy pre-election tension when President Lissouba's army attacks the residence of former dictator Sassou Nguesso. Rebels, backed by Angolan troops, take Brazzaville by force. Fighting breaks out again in September 1998 and continues through September 1999. Pointe Noire Peace Agreement ends fighting in December 1999.
Congo-Kinshassa	1996	2003	Tutsis residing in eastern Zaire form the core of a rebel army which, with substantial help from Rwanda, defeat government troops, oust Mobutu's regime, and install Kabila in power. After taking power, Kabila cuts ties with Tutsi allies, who subsequently reignite armed challenges to the new regime. A breakthrough war came with a power-sharing agreement during the Inter-Congolese National Dialogue in April 2003; implementation of the power-sharing government on July 1, 2003, led to integration of key militias into the central army and ended coordination among hold-out, regional militias.

A 3 (Continued)

Country	Begin	End	Description
Egypt	2011	ongoing	Inspired by popular protests in Tunisia, Egyptian liberal and Islamist activists hold mass demonstrations against the Mubarak regime and are met with lethal repression. The protests lead to Mubarak's resignation on 11 February 2011 and initiate a democratic transition; presidential elections result in a victory for Muslim Brotherhood candidate Mohamed Morsi but legislative elections won by the Muslim Brotherhood are overturned by the courts. President Morsi tries to push through a new constitution but is ousted by a military coup on 3 July 2013. The military violently represses protests against the coup and outlaws the Muslim Brotherhood. As a result, an Islamist insurgency begins in the Sinai and southern Egypt.
Guinea-Bissau	1998	1999	Brig. Asumane Mane dismissed over allegation of arms smuggling. Rebel soldiers, led by Mane, attempt coup, leading to civil war. President Vieira's government is ousted in May 1999 and a transitional government is set up, leading to January 2000 elections.
Guinea	2000	2001	Rebel groups attack Guinean forces in the Parrot's Beak region from bordering areas of Sierra Leone and Liberia. Rebellion is crushed in March 2001.
India	2001	Ongoing	The Maoist People's War Group (PWG) rekindles an insurgency among "dalits" (Scheduled Tribes) in the forested regions in the east, mainly in Jharkhand, Chhattisgarh, and Andhra Pradesh. The PWG joined forces with a second group, the Maoist Communist Centre (MCC), to form the People's Liberation Guerrilla Army in late 2004. The earlier, more narrowly based "Naxalite" movement is listed as an ethnic war, 1967-71.
Indonesia	1998	1999	Economic decline leads to mass demonstrations, widespread protest, and rioting in Jakarta. Suharto resigns; Habibie takes over in interim, but riots and mass protests continue.
Ivory Coast	2011	2011	The results of long-delayed presidential elections held in December 2010 were negated by officials loyal to President Gbagbo. Having failed to negotiate a transfer of authority. armed forces supporting the winning candidate, Allasane Ouattara, launched an offensive against the Gbagbo regime. With assistance from French forces, loyalist forces were defeated and Gbagbo was captured in April 2011; Ouattara was installed as president in May 2011.
Liberia	2000	2003	A loose coalition of rebel forces, Liberians United for Reconciliation and Democracy (LURD), initiate an armed rebellion in Liberia from bases in neighboring Guinea in November 2000 with the expressed aim of toppling Charles Taylor from power. Taylor resigns and leaves country under intense international pressure on August 11 and a peace agreement is reached on August 14, 2003.

A 3 (Continued)

Country	Begin	End	Description
Libya	2011	2011	Encouraged by popular uprisings in neighboring Arab countries Tunisia and Egypt, protests against Col. Gaddafi's autocratic regime take place in eastern urban centers in January 2011 and quickly escalate to armed insurrection as regime forces are deployed to repress dissent. NATO warplanes are deployed against regime armed forces and command structures in support of a UN Security Council mandate to "protect the civilian population." Gaddafi's forces were driven from the capital, Tripoli, by rebel forces in early August 2011; the regime collapsed and Gaddafi was captured and killed by rebel fighters on 20 October 2011.
Libya	2014	ongoing	Militia forces that overthrew Gaddafi began to coalesce in accordance with regional, tribal, and secular/Islamist divisions. Rival governments in east and west loosely aligned with secular and Islamist forces fighting eah other for control over resources.
Mali	2012	ongoing	Ethnic-Tuareg militants of the National Movement for the Liberation of Azawad (MNLA) supported by Islamist Ansar Dine militantsattacked overnment forces in the north beginning in January 2012 and on 6 April 2012 declared an independent Islamic state in the north which subsequently fell under the control of the Ansar Dine.
Mexico	2007	Ongoing	Shortly after gaining office in 2006, President Calderon deployed federal law enforcement personnel and federal troops in an attempt to control increasingly violent competition among drug traffickers enabled by corrupt local authorities, particularly in areas bordering the United States.
Nepal	1996	2006	Militants associated with the Communist Party of Nepal (Maoist) initiate armed insurrection. Following the assassinations of the Nepalese royal family and the ascension of King Gyanendra, Prime Minister Deuba initiates peace talks in July 2001 but the conflict intensifies once again in November 2001 as the talks fail. King Gyanendra seizes control of the government in October 2002 but is unable to establish social order. Civilian government is reinstated on April 24, 2006, and rebel forces immediately declare a cease-fire. A comprehensive peace agreement was signed on November 21, 2006.
Nigeria	2009	ongoing	Increasing provocations by anti-Western "Boko Haram" Islamist militants operating in the northeast centered on the city of Maiduguri trigger a crackdown by Nigerian security forces in July 2009 that results in about 800 killed. The militants regroup in 2010 and stage regular attacks on political targets in the northeast.
Yemen	2004	2014	Followers of dissident cleric Husain Badr al-Din al-Huthi create a stronghold in Saada; government forces attack In June 2004. Leader al-Huthi is killed in September 2004, however, serious fighting flares again in early 2005 and early 2006.

A 3 (Continued)

Country	Begin	End	Description
Yemen	2011	2014	Widespread discontent with the regime of President Ali Abdullah Saleh sparks major demonstrations beginning in late January 2011. The protests continue and lead to a spilt in the ruling elites and international pressure for Saleh to transfer power to an interim government. Negotiations fail and violence increases, particularly in the south where support for secession has remained strong since Yemen's unification in May 1990. Militants associated with al Qaeda of the Arabia Peninsula (AQAP) complicate local dynamics and trigger a US military response.
Yemen	2015	ongoing	Houthi (Zaydi) rebels join forces with supporters of former President Ali Abdullah Saleh to seize control of the capital, Sanaa, forcing the government of Interim President Mansur Hadi to flee. Supporters of the Hadi government establish a base in Aden and civil ensues. Hadi forces are supported militarily by a coalition forces led by Saudi Arabia. Also involved in the fighting are southern separatists and Al Qaeda in the Arabian Peninsula (AQAP).

Source: Marshall et al. (2017)

A 4 Correlation between HDI, governance, ICT and log real GDP per capita

	Log Real GDP per capita
Human Development Indicator	0.9246
Governance PC	0.7951
ICT PC	0.8151

Source: Author's computations based on World Development Indicators and World Governance Indicators from (World Bank, 2018)

A 5 Baseline model with different measures of hyperinflation

	(3)	(5)	(7)	(9)
VARIABLES	**>30%**	**>50%**	**>70%**	**>100%**
Log real GDP per capita	-0.00839***	-0.00841***	-0.00825***	-0.00826***
	(-2.718)	(-2.721)	(-2.712)	(-2.713)
5-years average rate of real GDP	-0.0978*	-0.0931*	-0.0955*	-0.0953*
growth	(-1.835)	(-1.759)	(-1.812)	(-1.808)
Oil exporter	-0.00444	-0.00434	-0.00453	-0.00454
	(-0.753)	(-0.744)	(-0.782)	(-0.783)
Log population	-0.000949	-0.000905	-0.000977	-0.000975
	(-0.740)	(-0.702)	(-0.767)	(-0.764)
Democracy	0.00396	0.00393	0.00398	0.00397
	(0.905)	(0.910)	(0.912)	(0.911)
Media censorship	0.0317**	0.0309**	0.0321**	0.0320**
	(2.441)	(2.385)	(2.474)	(2.472)
Hyper inflation	**-0.00300**	**0.000910**	**-0.00527**	**-0.00496**
	(-0.427)	**(0.121)**	**(-0.582)**	**(-0.540)**
Observations	2,505	2,505	2,505	2,505
Number of countries	151	151	151	151
Log pseudo-likelihood	-155.47033	-155.59551	-155.36369	-155.39647
Pseudo R-squared	0.3398	0.3393	0.3403	0.3402

Note: The dependent variable is successful revolution extracted from Archigos dataset. The estimation method is panel probit random-effects method. The model includes a constant term. The marginal effects of the following new variables are reported in the table: hyperinflation (>30%) in column (1), hyperinflation (>50%) in column (2), hyperinflation (>70%) in column (3), and hyperinflation (>100%) in column (4). All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 6 Robustness check: replace democracy in the baseline model with polity 2 and DD

VARIABLES	(1) Polity2	(2) Marginal effects with Polity 2	(3) DD	(4) Marginal effects with DD
Log real GDP per capita	-0.457***	-0.00803***	-0.473***	-0.00799***
	(-2.686)	(-2.608)	(-2.739)	(-2.673)
5-years average rate of real GDP	-5.253*	-0.0923*	-4.045	-0.0684
growth	(-1.917)	(-1.746)	(-1.398)	(-1.341)
Oil exporter	-0.215	-0.00379	-0.000635	-1.07e-05
	(-0.649)	(-0.661)	(-0.00198)	(-0.00198)
Log population	-0.0536	-0.000942	-0.0397	-0.000671
	(-0.733)	(-0.703)	(-0.803)	(-0.757)
Polity 2	**0.0281**	**0.000494**		
	(1.141)	**(1.121)**		
DD			**0.361**	**0.00610**
			(1.348)	**(1.409)**
Media censorship	2.012***	0.0354**	1.905***	0.0322***
	(2.791)	(2.502)	(2.912)	(2.654)
Constant	-0.984		-1.274	
	(-0.659)		(-1.047)	
Observations	2,505	2,505	1,933	1,933
Number of countries	151		169	
Log pseudo-likelihood	-155.31024		118.21104	
Pseudo R-squared	0.3405		0.4980	

Note: The dependent variable is successful revolution from Archigos dataset. We replace democracy in the baseline model with Polity 2 score in column (1) and DD in column (3). The marginal effects are respectively shown in columns (2) and (4). Panel probit random-effects method is used. All variable are lagged one period. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 7 Robustness check: replace democracy with DD in the interaction term of Table 7

VARIABLES	(1) DD*log real GDP per capita	(2) Marginal effects
Log real GDP per capita	-0.142	-0.00931***
	(-0.570)	(-2.831)
5-years average rate of real GDP growth	-3.963	-0.0683
	(-1.382)	(-1.329)
Oil exporter	-0.0768	-0.00132
	(-0.244)	(-0.243)
Log population	-0.0208	-0.000359
	(-0.440)	(-0.437)
DD	2.263*	-0.000110
	(1.889)	(-0.0183)
DD*log real GDP per capita	**-0.611**	
	(-1.611)	
Media censorship	1.497**	0.0258**
	(2.106)	(2.057)
Constant	-2.313*	
	(-1.761)	
Observations	1,933	1,933
Log pseudo-likelihood	-117.11458	
Pseudo R-squared	0.5027	
Number of countries	169	
Marginal effects of GDP over DD		
DD=1		**-0.00701*** **
		(-2.758)
DD=0		**-0.00477**
		(-0.589)

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method with random-effects probit model. The interaction term in column (1) is DD*log real GDP per capita. The respective marginal effect is in column (2) and those of the interaction term at the bottom of the table. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 8 Robustness check: replace oil exporter with fuel exports % in the baseline model and in model 3

VARIABLES	(1) Fuel Exports in the baseline model	(2) Marginal effects	(3) Fuel exports in model 3	(4) Marginal effects
Log real GDP per capita	-0.463***	-0.00784**	0.242	0.00231
	(-2.677)	(-2.446)	(0.567)	(0.568)
5-years average rate of real GDP	-5.427*	-0.0918*	-5.343	-0.0510
growth	(-1.895)	(-1.777)	(-1.184)	(-1.020)
Fuel exports	**-0.395**	**-0.00669**	**-1.041***	**-0.00993**
	(-0.748)	**(-0.794)**	**(-1.816)**	**(-1.517)**
Log population	-0.0456	-0.000772	-0.106	-0.00101
	(-0.617)	(-0.595)	(-1.146)	(-1.525)
Democracy	0.182	0.00307	-0.260	-0.00248
	(0.719)	(0.718)	(-0.779)	(-0.761)
Media censorship	1.772**	0.0300**	0.312	0.00298
	(2.323)	(2.277)	(0.316)	(0.310)
Governance PC			-0.239*	-0.00228
			(-1.696)	(-1.575)
ICT PC			-0.236*	-0.00225
			(-1.671)	(-1.643)
Observations	2,503	2,503	1,550	1,550
Number of countries	151		144	
Log pseudo-likelihood	-150.98053		-79.247261	
Pseudo R-squared	0.3589		0.6635	

Note: The dependent variable in column (1) is successful revolution from Archigos dataset. The estimation method used is Panel probit random-effects. Oil exporter is replaced by Fuel exports % in the baseline model (column 1) and in model 3 (column 3). The marginal effects are shown in columns (2) and (4), respectively. The model includes a constant term. All variables are lagged one period. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 9 Robustness check: replace democracy with polity 2 in model 5

	Non-democratic		Democratic	
	(1)	(2)	(3)	(4)
VARIABLES	Polity 2 <6	Marginal effects	Polity 2>6	Marginal effects
Log real GDP per capita	0.0931	0.00165	0.808	0.00176
	(0.144)	(0.140)	(0.706)	(0.563)
5-years average rate of real	-10.83*	-0.192	4.232	0.00923
GDP growth	(-1.864)	(-1.523)	(0.609)	(0.502)
Oil exporter	-1.327**	-0.0236	-	-
	(-2.308)	(-1.523)		
Log population	-0.257	-0.00456	0.0386	8.41e-05
	(-1.325)	(-1.456)	(0.249)	(0.215)
Media censorship	1.158	0.0205	-1.250	-0.00273
	(0.994)	(0.986)	(-0.359)	(-0.339)
Governance PC	-0.305*	-0.00541	-0.630	-0.00137
	(-1.763)	(-1.380)	(-1.146)	(-0.742)
ICT PC	-0.0811	-0.00144	-0.619**	-0.00135
	(-0.448)	(-0.440)	(-2.143)	(-0.863)
Observations	518	518	1,140	1,140
Number of countries	66		111	
Log pseudo-likelihood	-40.512817		-33.492015	
Pseudo R-squared	0.6920		0.6597	

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. In column (1), the analysis is restricted to the sample of non-democratic countries and in column (2) to the sample of democratic countries based on the Polity 2 score. The marginal effect is reported in column (3) and (4), respectively. All variables are one period lagged. The model includes a constant term. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 10 Robustness check: replace democracy with DD in model 5

	Non-democratic		Democratic	
VARIABLES	(1) DD=0	(2) Marginal effects	(3) DD=1	(4) Marginal effects
Log real GDP per capita	0.623	0.00455	0.0317	0.000148
	(1.323)	(1.213)	(0.0596)	(0.0602)
5-years average rate of real GDP	-11.15***	-0.0815	-6.359	-0.0297
growth	(-2.689)	(-1.578)	(-0.822)	(-0.799)
Log population	-0.0277	-0.000202	0.0278	0.000130
	(-0.332)	(-0.342)	(0.323)	(0.291)
Oil exporter	**-1.261****	**-0.00921***	-	-
	(-2.448)	**(-1.859)**		
Media censorship	0.355	0.00259	2.438	0.0114
	(0.290)	(0.276)	(1.373)	(1.304)
Governance PC	-0.347*	-0.00253**	-0.0447	-0.000208
	(-1.956)	(-2.052)	(-0.262)	(-0.262)
ICT PC	-0.356**	-0.00260*	-0.334	-0.00156
	(-2.196)	(-1.851)	(-1.504)	(-1.416)
Constant	-4.287**		-4.358*	
	(-2.007)		(-1.663)	
Observations	1,148	1,148	1,285	1,285
Number of countries	162		139	
Log pseudo-likelihood	-58.309255		-55.176402	
Pseudo R-squared	0.6010		0.6213	

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. In column (1), the analysis is restricted to the sample of non-democratic countries and in column (2) to the sample of democratic countries based on the DD variable. The marginal effect is reported in columns (3) and (4), respectively. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 11 Robustness check: replace democracy with polity in model 5

	Non-democratic		Democratic	
VARIABLES	(1) Polity <6	(2) Marginal effects	(3) Polity >6	(4) Marginal effects
Log real GDP per capita	0.275	0.00667	2.113**	5.64e-05
	(0.520)	(0.493)	(2.293)	(0.697)
5-years average rate of real GDP growth	-15.91***	-0.386**	8.636*	0.000231
	(-3.474)	(-2.360)	(1.868)	(0.531)
Oil exporter	**-1.315*** **	**-0.0319** **	-	-
	(-2.608)	**(-2.033)**		
Log population	0.00799	0.000194	-0.111*	-2.97e-06
	(0.0581)	(0.0582)	(-1.843)	(-0.657)
Media censorship	-0.987	-0.0239	3.136**	8.37e-05
	(-0.873)	(-0.917)	(2.359)	(0.491)
Governance PC	-0.0990	-0.00240	-0.292	-7.80e-06
	(-0.581)	(-0.549)	(-0.833)	(-1.029)
ICT PC	-0.280*	-0.00679	-0.732***	-1.96e-05
	(-1.654)	(-1.516)	(-5.892)	(-0.589)
Constant	-1.870		-11.46***	
	(-0.597)		(-4.352)	
Observations	519	519	1,142	1,142
Number of countries	65		112	
Log pseudo-likelihood	-56.235541		-9.0231089	
Pseudo R-squared	0.6410		0.8702	

Note: The dependent variable is successful revolution from Archigos dataset. The estimation method is panel probit random-effects method. In column (1), the analysis is restricted to the sample of non-democratic countries and in column (2) to the sample of democratic countries based on the polity score. The marginal effect is reported in columns (3) and (4), respectively. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 12 Sensitivity check: dropping oil exporter from the baseline model

VARIABLES	(1) Excluding oil exporter	(2) Marginal effects
Log real GDP per capita	**-0.539*** **	**-0.0110*** **
	(-3.665)	**(-3.812)**
5-years average rate of real GDP growth	**-5.853*** **	**-0.120*** **
	(-2.887)	**(-2.753)**
Log population	-0.0643	-0.00132
	(-0.938)	(-0.903)
Democracy	0.173	0.00354
	(0.766)	(0.756)
Media censorship	**1.100** **	**0.0225***
	(2.026)	**(1.822)**
Observations	3,079	3,079
Number of countries	158	
Log pseudo-likelihood	-207.24262	
Pseudo R-squared	0.12	

Note: The dependent variable is successful revolution from Archigos dataset. Oil exporter is dropped from the baseline model. The marginal effects are shown in column (2). The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 13 Sensitivity check: dropping media censorship from the baseline model

VARIABLES	(1) Excluding Media censorship	(2) Marginal effects
Log real GDP per capita	**-0.624*** **	**-0.0131*** **
	(-4.184)	**(-3.972)**
5-years average rate of real GDP growth	-4.636	-0.0971
	(-1.546)	(-1.548)
Oil exporter	-0.0482	-0.00101
	(-0.159)	(-0.160)
Log population	-0.0156	-0.000328
	(-0.229)	(-0.228)
Democracy	-0.0715	-0.00150
	(-0.331)	(-0.329)
Observations	2,506	2,506
Number of countries	151	
Log pseudo-likelihood	-159.02791	
Pseudo R-squared	0.3247	

Note: The dependent variable is successful revolution from Archigos dataset. Media censorship was dropped from the baseline model. The marginal effects are shown in column (2). The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 14 Sensitivity Check: dropping democracy from the baseline model

VARIABLES	(1) Excluding Democracy	(2) Marginal effects
Log real GDP per capita	**-0.490*** **	**-0.00739*** **
	(-3.002)	**(-2.782)**
5-years average rate of real GDP growth	**-5.306***	**-0.0799***
	(-1.881)	**(-1.775)**
Oil exporter	-0.243	-0.00366
	(-0.738)	(-0.762)
Log population	0.00798	0.000120
	(0.150)	(0.150)
Media censorship	**1.439*** **	**0.0217** **
	(2.618)	(2.407)
Observations	2,827	2,827
Log pseudo-likelihood	-157.78809	
Pseudo R-squared	0.33	
Number of countries	174	

Note: The dependent variable is successful revolution from Archigos dataset. Democracy is excluded from the baseline model. The marginal effects are shown in column (2). The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 15 Sensitivity check: dropping average 5-years average rate of real GDP growth from the baseline model

VARIABLES	(1) Excluding 5-years average rate of real GDP growth	(2) Marginal effects
Log real GDP per capita	**-0.480*** **	**-0.00869*** **
	(-2.709)	**(-2.677)**
Oil exporter	-0.221	-0.00400
	(-0.630)	(-0.640)
Log population	-0.0660	-0.00120
	(-0.930)	(-0.888)
Democracy	0.236	0.00428
	(0.942)	(0.943)
Media censorship	**1.714** **	**0.0311** **
	(2.446)	**(2.330)**
Observations	2,505	2,505
Log pseudo-likelihood	-157.0132	
Pseudo R-squared	0.3333	
Number of countries	151	

Note: The dependent variable is successful revolution from Archigos dataset. 5-years average rate of real GDP growth was dropped from the baseline model. The marginal effects are shown in column (2). The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 16 Sensitivity check: dropping log real GDP per capita from the baseline model

VARIABLES	(1) Excluding log real GDP per capita	(2) Marginal effects
5-years average rate of real GDP growth	-4.319	-0.0911
	(-1.562)	(-1.460)
Oil exporter	-0.501	-0.0106
	(-1.538)	(-1.613)
Log population	-0.0535	-0.00113
	(-0.801)	(-0.778)
Democracy	0.210	0.00444
	(0.812)	(0.805)
Media censorship	**2.251*** **	**0.0475*** **
	(3.644)	**(3.477)**
Observations	2,539	2,539
Number of countries	153	
Log pseudo-likelihood	-159.37942	
Pseudo R-squared	0.3232	

Note: The dependent variable is successful revolution from Archigos dataset. Log real GDP per capita was dropped from the baseline model. The marginal effects are shown in column (2). The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 17 Sensitivity check: dropping log population from the baseline model

VARIABLES	(1) Excluding log population	(2) Marginal effects
Log real GDP per capita	**-0.472*** **	**-0.00848*** **
	(-2.780)	**(-2.723)**
5-years average rate of real GDP growth	**-5.548** **	**-0.0997** **
	(-1.986)	**(-1.809)**
Oil exporter	-0.243	-0.00436
	(-0.724)	(-0.745)
Democracy	0.195	0.00351
	(0.760)	(0.776)
Media censorship	**1.664** **	**0.0299** **
	(2.346)	**(2.306)**
Observations	2,505	2,505
Number of countries	151	
Log pseudo-likelihood	-155.86948	
Pseudo R-squared	0.3381	

Note: The dependent variable is successful revolution from Archigos dataset. Log population was dropped from the baseline model. The marginal effects are shown in column (2). The model includes a constant term. All variables are one period lagged. Robust z-statistics in parentheses ***p < 0.01, **p < 0.05, *p < 0.1

A 18 Estimating the baseline model with Zero-Inflated Poisson model, Zero-Inflated Binomial model Vs. RE probit model

	(1)	(2)	(3)
	Successful revolutions		
VARIABLES	ZIP	ZINB	RE probit
Log Real GDP per capita	-0.00774***	-0.00774***	-0.00840***
	(-2.800)	(-2.804)	(-2.724)
Av. 5 years real GDP growth %	-0.0970**	-0.0970**	-0.0938*
	(-2.181)	(-2.183)	(-1.788)
Log population	-0.000618	-0.000618	-0.000917
	(-0.602)	(-0.602)	(-0.711)
Democracy	0.00159	0.00159	0.00395
	(0.450)	(0.450)	(0.904)
Media Censorship	0.0239**	0.0239**	0.0312**
	(2.378)	(2.380)	(2.403)
Oil Exporter	-0.00305	-0.00305	-0.00435
	(-0.681)	(-0.681)	(-0.746)
Observations	2,505	2,505	2,505
Observations with dep. =1	33	33	33
Log pseudo-likelihood	-160.215	-160.215	-155.60609
Pseudo R-squared	0.089	0.089	0.3393

Note: The marginal effects of estimating the baseline model with ZIP and ZINB are reported in columns 1 and 2 respectively. The marginal effects of the baseline model estimated with probit random-effects model are reported in column 3. All models include a constant term. z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

APPENDIX B: APPENDICES TO CHAPTER 2

B 1 Candidates and winners in the 1996 elections

District	Candidates	Seats Won
Beirut 1	Hariri Bloc (Future Movement)	4
	Hoss Bloc	1
	Independent	1
	The People	
Beirut 2	Hariri Bloc (Future Movement)	1
	Hoss Bloc	1
	Independents	
	Hezbollah	
	The People	
	Syrian Social Nationalist Movement	1
	People's Movement	1
	Amal	1
	Committees and Popular league	1
Beirut 3	Hariri Bloc (Future Movement)	5
	Independents	
	Syrian Social Nationalist Party	
	Tashnag	1
	Henchag	1
	Hoss Bloc	
	National Union	
	The People	
Keserwan	Independents	5
Byblos	Independents	3
Matn	Syrian Social Nationalist Party	1
	Northern Matn Bloc	5
	Democratic Renewal Movement	1
	The People	
	Tashnag	1
	Independents	
Baabda	Promise Party	2
	Independent	2
	Hezbollah	
	Syrian Social Nationalist Party	
	Reconciliation and Renewal	
	Progressive Socialist Party	1

B 1 (Continued)

District	Candidates	Seats Won
Baabda	Hariri Bloc (Future Movement)	1
	Lebanese Dignity	
Alay	Progressive Socialist Party	1
	Syrian Social Nationalist Party	1
	Independents	3
Chouf	Progressive Socialist Party	2
	Workers League	1
	Independents	5
	Lebanese Communist Party	
Sidon	Independents	1
	Islamic jamaha	
	Nasserite Popular Organization	1
Sidon Villages	Independents	2
	Amal Movement	1
	Democratic Choice	
	Syrian Social Nationalist Party	
Tyre	Amal Movement	2
	Hezbollah	1
	Independents	1
	Democratic Choice	
Bint Jbeil	Amal Movement	2
	Hezbollah	1
	Lebanese Communist Party	
	Independents	
Jezzine	Independents	3
	Democratic Choice	
Marjeyoun- Hasbaya	Amal Movement	1
	Hezbollah	1
	Democratic Choice	
	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Independents	2
Nabtieh	Hezbollah	1
	Democratic Choice	
	Independents	2
Akkar	Arab Socialist Baath Party	1
	Independents	3
	Committees and Popular League	
	Syrian Social Nationalist Party	

B 1 (Continued)

District	Candidates	Seats Won
Akkar	Islamic Jamaha	1
	Popular Akkar Union	1
Bcharri	North National Front	1
	Independents	1
Minnieh-Donnieh	Independents	3
	Syrian Social Nationalist Party	
Tripoli	Arab Social Baath Party	
	National Youth Party	1
	Independents	6
	Arab Liberation Party	1
Zgharta	Frangieh Bloc (Marada)	1
	Independents	2
Koura	Syrian Social Nationalist Party	
	Independents	3
Batroun	Independents	2
	Lebanese Phalange Party (Kataeb)	
Baalbak- Hermel	Amal Movement	2
	Hezbollah	3
	Arab Socialist Baath Party	1
	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Independents	3
Zahle	Sakf Bloc	2
	Tashnag	1
	Independents	3
West Bekaa- Rachaya	Arab Socialist Union	1
	Independents	3
	Amal	1
	Lebanese Communist Party	
	Lebanese Arab Struggle Movement	1

Source: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers.

B 2 Candidates and winners in the 2000 elections

District	Candidates	Seats Won
Beirut 1	Hariri Bloc (Future Movement)	6
	Tashnag	
	Independents	
	Syrian Social Nationalist Party	
Beirut 2	Hariri Bloc (Future Movement)	4
	Independent	
	Hezbollah	1
	Committees and Popular league	1
Beirut 3	Hariri Bloc (Future Movement)	5
	Independent	
	Ramgavar	1
	Tashnag	
	Progressive Socialist Party	1
	Islamic Charitable Project Association	
Keserwan	Independents	5
	Syrian Social Nationalist Party	
Byblos	Independents	3
Matn	Syrian Social Nationalist Party	1
	Northern Matn Bloc	3
	Democratic Renewal Movement	1
	Lebanese Phalange Party (Kataeb)	1
	Tashnag	1
	Independents	
	Lebanese Communist Party	
	Rally for Democracy	1
Baabda	Lebanese Phalange Party	1
	Independents	2
	Hezbollah	1
	Promise Party	
	Progressive Socialist Party	1
	Lebanese Communist Party	
	National Bloc Party	1
Alay	Progressive Socialist Party	1
	Syrian Social Nationalist Party	
	Lebanese Communist Party	
	Lebanese Democratic Party	1
	Independents	3
Chouf	Progressive Socialist Party	2
	Syrian Social Nationalist Party	
	Independents	6

B 2 (Continued)

District	Candidates	Seats Won
Chouf	Workers League	
	Lebanese Communist Party	
Sidon	Independents	1
	Nasserite Popular Organization	1
Sidon Villages	Independents	2
	Amal Movement	1
	Lebanese Communist Party	
Tyre	Amal Movement	2
	Hezbollah	1
	Independents	1
Bint Jbeil	Amal Movement	2
	Hezbollah	1
	Lebanese Communist Party	
	Independents	
Jezzine	Independents	3
Marjeyoun- Hasbaya	Amal Movement	1
	Hezbollah	1
	Democratic Choice	
	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Independents	1
	Arab Socialist Baath Party	1
Nabtieh	Hezbollah	1
	Lebanese Communist Party	
	Independents	2
Akkar	Arab Socialist Baath Party	1
	Independents	5
	Syrian Social Nationalist Party	
	Islamic Jamaha	
	Lebanese Communist Party	
	Popular Akkar Union	1
Bcharri	Solidarity Party	
	Independents	2
Minnieh-Donnieh	Independents	3
	Syrian Social Nationalist Party	
Tripoli	Democratic Renewal Movement	1
	Lebanese Communist Party	
	Independents	6
	Arab Liberation Party	1
Zgharta	Frangieh Bloc (Marada)	1

B 2 (Continued)

District	Candidates	Seats Won
Zgharta	Independents	2
Koura	Syrian Social Nationalist Party	1
	Franjieh Bloc (Marada)	
	Independents	2
Batroun	Independents	1
	Franjieh Bloc (Marada)	1
Baalbak- Hermel	Amal Movement	2
	Hezbollah	3
	Arab Socialist Baath Party	1
	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Lebanese Phalange Party (Kataeb)	1
	Independents	2
Zahle	Skaf Bloc	1
	Tashnag	1
	Independents	5
West Bekaa- Rachaya	Arab Socialist Union	1
	Independents	3
	Amal	1
	Lebanese Communist Party	
	Lebanese Arab Struggle Movement	1

Source: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers

B 3 Candidates and winners in the 2005 elections

District	Candidates	Seats Won
Beirut 1	Future Movement	2
	Lebanese Forces	1
	Independents	
	Independents M14	3
Beirut 2	Future Movement	2
	Independent	
	Hezbollah	1
	Henchak	1
	Independents M14	2
Beirut 3	Future Movement	3
	Independents	
	Independents M14	2
	Ramgavar	1
	Progressive Socialist Party	1
	Islamic Charitable Project Association	
Keserwan	Independents	
	Free Patriotic Movement	4
	Independents M14	1
	Qornet Chehwan	
	Lebanese Phalange Party (Kataeb)	
Byblos	Independents	
	Independents M14	
	Free Patriotic Movement	3
	Qornet Chehwan	
Matn	Syrian Social Nationalist Party	
	Northern Matn Bloc	1
	Free Patriotic Movement	3
	Lebanese Phalange Party (Kataeb)	1
	Tashnag	1
	Independents	
	Independents M14	2
	Lebanese Communist Party	
	Lebanese Forces Party	
	Democratic Renewal Movement	
	Qornet Chehwan	
Baabda	Lebanese Phalange Party (Kataeb)	1
	Hezbollah	1
	Independents	
	Independents M14	
	Lebanese Forces Party	1

B 3 (Continued)

District	Candidates	Seats Won
Baabda	Progressive Socialist Party	1
	Lebanese Communist Party	
	Future Movement	1
	National Bloc Party	1
Alay	Progressive Socialist Party	2
	Independents M14	3
	Independents M8	
	Independents	
Chouf	Progressive Socialist Party	2
	Independents M14	4
	Independents	
	Future Movement	1
	Lebanese Forces Party	1
	National Liberal Party	
Sidon	Future Movement	1
	Nasserite Popular Organization	1
Sidon Villages	Independents	
	Independents March8	2
	Amal Movement	1
	Lebanese Communist Party	
Tyre	Amal Movement	2
	Hezbollah	2
	Lebanese Communist Party	
	Independents	
Bint Jbeil	Amal Movement	2
	Hezbollah	1
	Lebanese Communist Party	
	Independents	
Jezzine	Independents March8	3
Marjeyoun- Hasbaya	Amal Movement	1
	Hezbollah	1
	Independents March14	1
	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Independents	
	Arab Socialist Baath Party	1
Nabtieh	Hezbollah	1
	Lebanese Communist Party	
	Independents March 8	2
	Independents	

B 3 (Continued)

District	Candidates	Seats Won
Akkar	Independents March14	3
	Independents	
	Future Movement	4
	Islamic Jamaha	
	Lebanese Communist Party	
	Popular Akkar Union	
Bcharri	Lebanese Forces Party	2
	Independents	
Minnieh-Donnieh	Independents	
	Independents March 14	2
	Future Movement	1
Tripoli	Democratic Renewal Movement	1
	Democratic Left Movement	1
	Independents March 14	4
	Independents	
	Iraqi Baath Party	
	Lebanese Phalange Party (Kataeb)	
	Future Movement	2
Zgharta	Frangieh Bloc (Marada)	
	Independents March 14	3
Koura	Independents	
	Independents March 14	2
	Lebanese Forces Party	1
Batroun	Independents	
	Independents March 14	1
	Lebanese Forces Party	1
Baalbak- Hermel	Amal Movement	1
	Hezbollah	3
	Arab Socialist Baath Party	
	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Lebanese Phalange Party (Kataeb)	1
	Independents	1
	Independents March 8	2
	Islamic Action Front	1
Zahle	Skaf Bloc	4
	Tashnag	1
	Free Patriotic Movement	1
	Lebanese Phalange Party (Kataeb)	
	Lebanese Forces Party	

B 3 (Continued)		
District	**Candidates**	**Seats Won**
Zahle	Independents March 14	1
	Independents	
West Bekaa- Rachaya	Progressive Socialist Party	1
	Independents	
	Independents March 14	2
	Amal Movement	1
	Future Movement	2
	Lebanese Communist Party	
	Lebanese Arab Struggle Movement	

Source: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers

B 4 Candidates and winners in the 2009 elections

District	Candidates	Seats Won
Beirut 1	Free Patriotic Movement	
	Lebanese Phalange Party (Kataeb)	1
	Henchak	1
	Tashnag	
	Ramgavar	1
	Independents	
	Independents M14	2
Beirut 2	Future Movement	1
	Independents	
	Amal Movement	1
	Tashnag	1
	Henchak	1
Beirut 3	Future Movement	7
	Committees and Popular League	
	Independents	
	Independents March 14	1
	Ramgavar	
	Progressive Socialist Party	1
	People Movement	
	Islamic Jamaha	1
Keserwan	Independents	
	Free Patriotic Movement	1
	Independents March 8	4
	Independents March 14	
	National Bloc Party	
	Lebanese Phalange Party (Kataeb)	
Byblos	Independents	
	Independents M14	
	Independents March 8	1
	Free Patriotic Movement	2
Matn	Syrian Social Nationalist Party	
	Northern Matn Bloc	1
	Free Patriotic Movement	3
	Lebanese Phalange Party (Kataeb)	1
	Tashnag	1
	Independents	
	Independents M14	
	Independents March 8	2
	Lebanese Forces Party	
Baabda	Free Patriotic Movement	3
	Hezbollah	2

B 4 (Continued)

District	Candidates	Seats Won
Baabda	Independents	
	Independents M14	
	Independents March 8	1
	National Liberal Party	
	Progressive Socialist Party	
	Future Movement	
	National Bloc Party	
Alay	Progressive Socialist Party	1
	Independents M14	2
	Lebanese Democratic Party	1
	Lebanese Phalange Party (Kataeb)	1
	Independents	
Chouf	Progressive Socialist Party	2
	Independents M14	3
	Independents	
	Future Movement	1
	Lebanese Forces Party	1
	National Liberal Party	1
	Workers League	
Sidon	Future Movement	2
	Nasserite Popular Organization	
	Independents	
Sidon Villages	Independents	1
	Independents March8	1
	Amal Movement	1
	Lebanese Communist Party	
	Lebanese Forces Party	
Tyre	Amal Movement	2
	Hezbollah	2
	Independents	
Bint Jbeil	Amal Movement	2
	Hezbollah	1
	Independents	
Jezzine	Independents March8	2
	Independents March 14	
	Independents	
	Free Patriotic Movement	1
Marjeyoun- Hasbaya	Amal Movement	1
	Hezbollah	1
	Independents March14	

B 4 (Continued)

District	Candidates	Seats Won
Marjeyoun- Hasbaya	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Independents March 8	1
	Independents	
	Arab Socialist Baath Party	1
Nabtieh	Hezbollah	1
	Independents March 8	2
	Independents	
Akkar	Independents	
	Future Movement	6
	Islamic Jamaha	1
	Popular Akkar Union	
Bcharri	Lebanese Forces Party	2
	Independents	
Minnieh-Donnieh	Independents	
	Independents March 14	1
	Future Movement	2
Tripoli	Democratic Renewal Movement	
	Arab Liberation Party	
	Independents March 14	5
	Independents	
	Lebanese Phalange Party (Kataeb)	1
	Future Movement	2
Zgharta	Marada	1
	Independents	
	Independents March 8	8
	Independents March 14	
Koura	Independents	
	Independents March 14	1
	Lebanese Forces Party	1
	Future Movement	1
	Marada	
	Free Patriotic Movement	
	Syrian Social Nationalist Party	
Batroun	Independents	
	Free Patriotic Movement	
	Independents March 14	1
	Lebanese Forces Party	1
Baalbak- Hermel	Amal Movement	1
	Hezbollah	5

B 4 (Continued)

District	Candidates	Seats Won
Baalbak- Hermel	Arab Socialist Baath Party	1
	Lebanese Communist Party	
	Syrian Social Nationalist Party	1
	Lebanese Phalange Party (Kataeb)	
	Independents	
	Lebanese Forces Party	
	Islamic Action Front	1
	Solidarity Party	1
Zahle	Skaf Bloc	
	Tashnag	
	Free Patriotic Movement	
	Lebanese Phalange Party (Kataeb)	1
	Lebanese Forces Party	
	Independents March 14	6
	Independents	
West Bekaa- Rachaya	Progressive Socialist Party	1
	Independents	
	Independents March 14	2
	Independents March 8	
	Amal Movement	
	Future Movement	3
	Lebanese Communist Party	
	Lebanese Arab Struggle Movement	

Source: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers

B 5 Number of seats won (and their change) per election year

POLITICAL PARTIES	1996		2000		2005		2009	
	Seats	+/-	Seats	+/-	Seats	+/-	Seats	+/-
Independents	59		62		5		0	
Committees & Popular Leagues (Bechara Merhej)	1	0	1	0			0	-1
Lebanese Arab Struggle Movement (Faysal Daoud)	1		1	0	0	-1	0	-1
Nasserite Popular Organization (M & O Saad)	1	0	1	0	1	0	0	-1
People's Movement (Najah Wakim)	1	0			0	-1	0	-1
Popular Akkar Union (Wajih Baarini)	1		1	0	0	-1	0	-1
Promise Party (Elias Hobeika)	2	0	0	-2				
Rally for Democracy (Albert Mkheiber)	0	-1	1	1				
Workers League (Zaher Khatib)	1	0	0	-1			0	-1
Union Party (Abdelrahim Mrad)	1		1	0				
Future Bloc (Rafic Hariri)	25		18		MARCH 14 ALLIANCE			
Future Movement (Official foundation 9 August 2007)					19		24	
Progressive Socialist Party (Walid Joumblat)	4	0	5	1	7	2	6	-1
Lebanese Forces Party (Samir Jahjaa)					7	7	5	-1
Lebanese Phalange Party			3	3	3	4	5	-1
Democratic Left Movement (Elias Atallah)					1	0	1	0
Islamic Jamaaha	1	-2	0	-1	0	0	1	1
Democratic Renewal Movement (N. Lahoud, M. Ahdab | 2001)			2	New	1	-1		
National Bloc Party (Carlos Eddeh)			1	1	1	0	0	-1
National Liberal Party (Dory Chamoun)					0	0	1	1
Ramgavar (Armenian Democratic Liberal Party)	1	1	1	0	1	0	1	0
Henchak (Social Democrat Hunchakian Party)	1	0	1	0	1	0	2	1
Free Patriotic Movement (Split from M14 on 6/2/2006)					10	10		
March 14 - Independents Affiliated					37	New	25	-12
Total					88		71	
					MARCH 8 ALLIANCE			
Amal Movement	8	3	9	1	7	-2	10	3
Hezballah	7	-2	8	2	10	2	12	2
Free Patriotic Movement (Split from M14 on 6/2/2006)							10	0
Syrian Social Nationalist Party	5	-1	4	-1	2	-2	2	0
Arab Socialist Baath Party	2	0	3	1	1	-2	2	1
Tashnag (Armenian Revolutionary Federation)	3	0	2	-1	2	0	2	0
Islamic Action Front (Kamel Rifai)					1	1	1	0

B 5 (Continued)								
Arabic Liberation Party (Omar Karameh)	1		1	0			0	-1
Lebanese Democratic Party (Talal Arslan)	1		1	0	0	-1	1	1
Solidarity Party (Emile Rahmeh)			0	0			1	New
Marada Movement	1	0	1	0	0	-1	1	1
March 8 - Independents Affiliated					11	New	15	4
Total					34		57	
TOTAL PARLIAMENT SEATS	128		128		128		128	

Sources: Nohlen, Grotz, & Hartmann (2003), El Khazen (1998), EU (2005), IFES (2009b), Chambers (2009)

B 6 1996 parliamentary elections results per district

	AMAL	HEZ	FM	SSNP	LCP	PSP	IND	M14
Beirut I			4				2	
Beirut II	1		1	1			1	
Beirut III			2				3	
Keserwan							5	
Byblos							3	
Matn				1			5	
Baabda			1			1	2	
Alay				1		1	2	
Chouf						2	5	
Sidon			1					
Sidon Villages	1						2	
Tyre	2	1					1	
Bint Jbeil	2	1						
Jezzine							3	
Marjeyoun- Hasbaya	1	1		1			2	
Nabatiyeh		1					2	
Akkar							3	
Bcharreh							1	
Donnieh- Minieh							3	
Tripoli							6	
Zgharta							1	
Koura							3	
Batroun							2	
Baalbak- Hermel	2	3		1			3	
Zahle							4	
West Bekaa- Rachaya	1						3	

Sources: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers

B 7 2000 parliamentary elections results per district

	AMAL	HEZ	FM	SSNP	LCP	PSP	IND	M14
Beirut I			6					
Beirut II		1	5					
Beirut III			5			1		
Keserwan							5	
Byblos							3	
Matn				1			3	
Baabda		1				1	2	
Alay						1	3	
Chouf						2	6	
Sidon			1					
Sidon Villages	1						2	
Tyre	2	1					1	
Bint Jbeil	2	1						
Jezzine							3	
Marjeyoun- Hasbaya	1	1		1			1	
Nabatiyeh		1					2	
Akkar							5	
Bcharreh							2	
Donnieh- Minieh							3	
Tripoli							6	
Zgharta							2	
Koura				1			2	
Batroun							2	
Baalbak- Hermel	2	3		1			2	
Zahle							6	
West Bekaa- Rachaya		1					3	

Sources: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers

B 8 2005 parliamentary elections results per district

	AMAL	HEZ	FM	SSNP	LCP	PSP	IND	M14
Beirut I			2					3
Beirut II		1	2					2
Beirut III			3			1		2
Keserwan								1
Byblos								2
Matn							1	2
Baabda		1	1					
Alay						2		3
Chouf			1			2		4
Sidon			1					
Sidon Villages	1							
Tyre	2	2						
Bint Jbeil	2	1						
Jezzine								
Marjeyoun- Hasbaya	1	1		1				1
Nabatiyeh		1						
Akkar			4					3
Bcharreh								
Donnieh- Minieh			1					2
Tripoli			2					4
Zgharta								3
Koura								2
Batroun								1
Baalbak- Hermel	1				1		1	
Zahle							4	1
West Bekaa- Rachaya	1		2			1		2

Sources: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers

B 9 2009 parliamentary elections results per district

	AMAL	HEZ	FM	SSNP	LCP	PSP	IND	M14
Beirut I								2
Beirut II	1		1					
Beirut III			6			1		1
Keserwan								
Byblos								
Matn								1
Baabda		2						
Alay						1		2
Chouf			1			2		2
Sidon			2					
Sidon Villages	1						1	
Tyre	2	2						
Bint Jbeil	2	1						
Jezzine								
Marjeyoun- Hasbaya	1	1				1		
Nabatiyeh		1						
Akkar			6					
Bcharreh								
Donnieh- Minieh			2					1
Tripoli			3					5
Zgharta								
Koura			1					1
Batroun								1
Baalbak- Hermel	1	5		1				
Zahle			2					1
West Bekaa- Rachaya			2			1		2

Sources: Author's computations based on data retrieved from MOIM, IFES, Information International and local news papers

B 10 Political parties in office during election years

1996[42]	2000[43]	2005[44]	2009[45]
Amal Movement; Baath Party; Committees and Popular League; Democratic Renewal Movement; Frangieh bloc (Marada); Hariri Bloc (Future Movement); Hoss Bloc; Independents; Lebanese Democratic Party; Northern Matn Bloc; North National Front; Progressive Socialist Party; Promise Party; Syrian Social Nationalist Party; Tashnag.	Amal Movement; Committees and Popular League; Frangieh Bloc (Marada); Hariri Bloc (Future Movement); Hoss Bloc; Independents; Lebanese Democratic Party; Nasserite Popular Organization; Northern Matn Bloc; Progressive Socialist Party; Syrian Social Nationalist Party; Tashnag; Tripoli Bloc.	Amal Movement; Baath Party; Frangieh Bloc (Marada); Free Patriotic Movement; Future Movement; Hezbollah; Independents; Independents March 14; Lebanese Democratic Party; Lebanese Phalenge Party (Kataeb); North National Front; Progressive Socialist Party; Ramgavar; Skaf Bloc; Syrian Social Nationalist Party; Tashnag; Tripoli Bloc.	Amal Movement; Democratic Renewal Party; Frangieh Bloc (Marada); Free Patriotic Movement; Future Movement; Hezbollah; Independents; Independents March 14; Independents March 8; Lebanese Democratic Party; Lebanese Forces Party; Lebanese Phalange Party (Kataeb); Progressive Socialist Party; Ramgavar; Skaf Bloc; Syrian Social Nationalist Party; Tashnag; Tripoli Bloc.

Source: Presidency of the Council of Ministers (n.d.)

[42] Rafik Hariri two consecutive governments: from 25 May 1995 until 7 November 1996; and from 7 November 1996 until 4 January 1998.

[43] Salim Hoss government from 4 January 1998 until 26 October 2000; and Rafik Hariri government from 26 October 2000 until 7 April 2003.

[44] Najib Mikati government from 19 April 2005 until 19 July 2005; and Fouad Seniora government from 19 July 2005 until 11 July 2008.

[45] Fouad Seniora government from 11 July 2008 until 9 November 2009; and Saad Hariri government from 8 December 2009 until 13 June 2011.