Institutions, economic policy and state capacity.

By

SOFIA TSARSITALIDOU

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Department of Economics

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Institutions, economic policy and state capacity.

Approved by:

Antonis Adam, Advisor
Department of Economics
University of Ioannina

Nikolaos Mylonidis
Department of Economics
University of Ioannina

Michael Chletsos
Department of Economics
University of Piraeus

Margarita Katsimi
Department of International and
European Economic Studies
*Athens University of
Economics and Business*

Thomas Moutos
Department of International and
European Economic Studies
*Athens University of
Economics and Business*

Christos Kollias
Department of Economics
University of Thessaly

Achilleas Vassilopoulos
Department of Economics
University of Ioannina

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Chapter 1: Introduction

Institutions and their effect on various aspects of economic outcomes have been long studied in the literature. Studies suggest that institutions do matter for the bad or good performance of an economy (Acemoglu and Robinson 2006; Collier 2008; Besley and Persson 2011; Acemoglu et al. 2019). The study of North (1982) is the first study that attributes bad economic performance in developing countries to the lack of good institutions. Then, Acemoglu and Robinson (2006), suggest that the conflict between elites and the population are the key determinants of the quality of institutions, which, in turn, are the only factors that matter for economic development. Similarly, following Tilly (1992), Besley and Persson (2009), argue that internal and external wars affect significantly institutions and state capacity.

The present thesis is related to the above analysis, as we examine in which way aspects of culture, such as religion, determine the quality of institutions which in turn, endogenously, affect economic performance. Our first goal is to provide clear evidence that there is a causal link between institutions and economic outcomes. We examine the effect of institutions on the external position of an economy, on conflict, as well as the way that culture affects the development of fiscal institutions. Our findings suggest that the role of cultural factors, such as religion, affects the development of institutions, like fiscal capacity or the type of the political regime, which in turn affect economic outcomes such as current account deficits. We also find that exogenous rents that do not come from taxation, and more specifically foreign aid revenues, determine the quality of institutions, since the affect domestic conflict, and result to an increase in

conflict events that aim to overthrow the political regime and consequently to more authoritarian political regimes.

Overall, this thesis is related to the literature that examines the causes and determinants of institutions and provides evidence on the causal relationship between institutions and economic outcomes.

We can separate this thesis in four parts. In the first one, we examine the effects of the political regime type on current account balance. Our findings suggest that democratic regimes run higher current account deficits. Our argument is that first, dictators are immune to public pressures relative to democratic elected leaders and thus can employ more easily strict measures in order to balance the current account. Second, democracies pay higher wages, (see Rodrik 1999), and this leads to an increase in real effective exchange rate. Last but not least, countries with autocratic regimes attract less foreign investments (Kalyvitis and Vlachaki 2012), and since such inflows are a way to balance the current account, dictators know that and try to keep the current account balanced. We estimate this causal effect by performing an instrumental variables analysis using as instrument the degree of religiosity inside an economy.

In the second and third part we examine the effect of church and state relationship on the development of fiscal institutions. More precisely, in the second part we construct a theoretical model in which we examine the effect of state religion on fiscal capacity investment, while in the third part we deal with this relationship empirically. Our theoretical model suggests that the investment in fiscal capacity is higher in the case where a state religion exists only when the degree of secularization is low. In the third part, we estimate the causal effect of state religion on fiscal capacity by performing matching techniques in order to model the counterfactual. Again, our

findings suggest that state religion produces lower levels of fiscal capacity. More general, our view is consistent to the fact that cultural factors affect the institutional quality of a country.

Finally, in the fourth part we examine the effect of foreign aid on conflict. Specifically, we perform a fuzzy Regression Discontinuity Design to estimate the effect of International Development Assistance (grants that are given by the World Bank to developing countries) on domestic conflict events. Our findings suggest that IDA increases those types of conflict that aim to overthrow the political regime while decreases these ones that aim to overthrow the government. In the following subsection, we discuss the four chapters of our thesis.

In the rest of this chapter, we provide a short introductory discussion for each one of the above chapters, their theoretical grounds and the strategies employed to derive our main findings.

1.1 Research questions

1.1.1 Political regime and current account balance

Most of the studies of the literature that examines the determinants of the external balance position of an economy, find that economic factors such as the net foreign asset position, the budget balance, the real effective exchange rate and the economic openness of a country are key factors affecting the current account position (see for example: Chinn and Prasad 2003; Gruber and Kamin 2007; Chinn and Ito 2007; Imam 2008; Endegnanew et al. 2012). This literature, however, seems to ignore the political institutions that may shape the external balance of the economy. To our view, it seems reasonable that a more democratic country will more easily determine its external relationships (see for example Adam and Filippaios 2007). For that reason, in our first chapter, we examine the effect of the political regime type on Current Account Balance. Our findings suggest that more democratic regimes will experience higher current account deficits. Our arguments are the following:

First dictators are more immune to public pressures compared to democratically elected politicians (Anderson 1988). For that reason, they can more easily undertake unpopular measures, such as tax increases, or expenditure decreases, without facing severe opposition by the general public. Also, according to Olson (1971), the cost of revolution is higher than the cost of voting, so people face a higher opportunity cost in dictatorships (i.e., the cost of joining a revolution). This implies that current account consolidations are more easily achieved in an autocratic environment.

Second, the supply of foreign capital in autocracies will tend to be lower relative to democracies, as foreign investment is lower too. And even when there is a high capital inflow, this can be rather threatening for the survival of the regime (Kalyvitis and Vlachaki 2012): increased holdings of capital by foreigners will result into

pressures on the dictator for democratization. Consequently, dictators that fear such foreign pressures will try to use policies keeping the current account balanced in order to decrease the reliance on net foreign assets. Finally, following Rodrik (1999) we expect democracies to pay higher wages than autocracies. This results into a real effective exchange rate appreciation and, consequently, to higher current account deficits.

In order to empirically examine the above relationship, we first estimate a Fixed Effects panel data model, using world sample over the period 1980-2012. We also estimate an instrumental variables model in order to establish a causal relationship between the political regime type and current account balance. The main instrument that we use is the share of Christian adherents in each country; according to Huntington (1993), Christianity played a key role on the democratization process during the third wave of democratization. Moreover, following Persson and Tabellini (2009) we use the average weighted democracy index of each country's neighbors. Following the literature, we find a positive association between the Polity score of a country with its neighbors. This is consistent with the democratization waves theory of Huntington (1993) and the regional clusters of democracy and autocracy observed by Persson and Tabellini (2009). Our main finding is that autocracies run lower current account deficits than democracies. This is the first step of identification of the relationship between institutions and economic performance.

1.1.2   State religion and fiscal capacity

In the second chapter of our study, we examine both theoretically and empirically the effect of an established state religion on the ability of the government

to raise revenues. The findings from the instrumental variables model of the first chapter, suggest that religiosity is correlated with the political regime type. For that reason, we seek to deepen on the role of religion on the development institutions. We examine both theoretically and empirically the effect of an established state religion on the level of fiscal capacity[1].

The literature, when examining the effect of state religion on revenues, has so far developed the so-called legitimization argument. According to this view, rulers are able to extract more revenues from the population when a state religion exists, since the church legitimizes the acts of the state (Auriol and Platteau 2017; Greif and Tadelis 2010; Vaubel 2017; Coşgel et al. 2018). As religious leaders have a greater influence on the population, they are able to incentivize individuals to respect the ruler, pay their tax obligations, and threaten to punish those who do not. Moreover, as a corollary to the above argument, when the state faces increasing needs for revenues, it will turn to the legitimizing force of the state-run church to increase compliance or even increase tax rates without spurring discontent. If this rationale was correct then countries with a state religion would have less of an incentive to undertake other costly revenue-raising policies, such as investment in improving the fiscal system, i.e., they would invest less in fiscal capacity. Thus, according to this argument, in the long run, the legitimization effect would adversely affect fiscal institutions.

In Chapter 3, we build a simple model of state and church competition, which is similar to Cosgel et al. (2016). This model helps us provide a theoretical underpinning of the relationship between the existence of a state religion and fiscal capacity inside an economy. Specifically, we examine i) a case where a state religion exists, and ii), a case

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[1] The term fiscal capacity refers to the ability of the government to raise revenues (e.g., Besley and Persson 2009; Dincecco and Prado 2012).

where church and state behave independently. We model church as a rent maximizer (see Ferrero 2002), which tries to maximize the number of followers. There are several studies suggesting that religious denominations act as typical secular firms employing strategies such as barriers to entry in order to increase their followers and consequently their revenues (Iannaccone 1998; Iyer 2018 etc.). Similarly, we assume that the state maximizes the rents from taxation. Therefore, we compare the fiscal capacity investment in these two cases. Our findings suggest that state religion produces a lower level of fiscal capacity than the competitive case as the degree of secularization inside an economy increases. We also test the stability of our model by examining two alternative cases. One where there is a state which competes with many religious denominations and a second one where the state bribes the religious denomination so as the latter to reduce these actions that pressure individuals to become religious. From Chapter 3 we derive a testable hypothesis; State religion leads to a lower level of fiscal capacity. We empirically test this relationship in Chapter 4.

Chapter 4 is related to a number of studies that examine the determinants of fiscal capacity (Thies 2005; Besley and Persson 2008, 2011; Cardenas 2010; Dincecco and Prado 2012). A common finding in this literature is that an external war increases fiscal capacity. As public defense is a public good that people value highly during wartime, the government follows the wishes of the citizenry and uses investment in fiscal capacity to finance it. The opposite happens with internal wars. As the leader faces uncertainty over his tenure, he has no incentive to invest in fiscal capacity. Our argument, then, is related to the above studies as it considers the effect of a different type of competition, that of the church and the state.

As a first step, we estimate the effect of having a state religion on fiscal capacity in a standard OLS model using data for 143 countries over the 2000–2015 period. Even

though these findings support our main argument and the testable hypothesis derived from Chapter 3, i.e., having a state religion significantly reduces fiscal capacity, out of concern that endogeneity might bias our findings, we also employ our data in a potential outcome framework. Using an inverse probability weighting scheme, we examine the effect of having a state religion in 2000, on the average 2000–2015 fiscal capacity. The findings from this latter model are qualitatively similar to the results of the OLS model.

Then, to examine our hypothesis in a historical context, we extend our data over the period from 1900 to 2010 by employing a dynamic inverse probability model as in Acemoglu et al. (2019). Our findings suggest that if a state religion is established at time zero, this will have a negative effect on fiscal capacity 10–16 years later. This negative relationship between state religion and fiscal capacity verifies the assumption that institutions matter for economic performance. The conflict between a religious denomination and state seems to be a key factor for the development of fiscal institutions which in turn affect economic performance.

From a policy perspective, our findings suggest that facing a challenging opposition will incentivize the government to invest in fiscal capacity in order not to lose potential revenues. A government that has no competition and also has a supportive religious group that legitimizes its acts has no incentive to invest in fiscal capacity since it can more easily achieve its goal and raise revenues through legitimization.

1.1.3 Foreign aid and conflict

Chapter 5 examines the effect of foreign aid revenues, and more precisely International Development Assistance provided by the World Bank, on domestic conflict. There are many studies that have long analyzed the effects of aid on conflict (Collier and Hoeffler 2002; Crost et al. 2016 etc.). To our knowledge, however, our

study is the first to use the (ad-hoc) GNI thresholds, that the World Bank employs to distribute aid among recipient countries, as an identification strategy. This allows us to perform a Regression Discontinuity Design in order to estimate the causal effect of IDA on conflict which is our first contribution to the literature. By performing a Regression Discontinuity Design, we estimate the effect of IDA on conflict for those countries that are just above and just below a threshold of GNI that World Bank sets in order to distribute IDA. In other words, we compare countries that are similar in general with their only difference to be the eligibility for IDA. However, since the threshold crossing is not a deterministic rule of recipient of IDA and there is also another criterion for IDA receipt (i.e., the lack of creditworthiness) we perform a Fuzzy Regression Discontinuity Design.

Our second contribution to the literature (e.g., Berthélemy 2006; Findley et al. 2010; Wood and Sullivan 2015) is that we examine the effects of foreign aid on different types of conflict. More precisely, we separate events to minor and major ones. Our findings suggest that International Development Assistance leads to a decline in events that aim to overthrow the government while increases events that aim to overthrow the political regime.

Our results are consistent with several theoretical contributions in the aid-conflict nexus. Since aid creates a "winning the hearts and minds" effect, i.e., improved economic performance makes people friendly inclined towards government and thus conflict is reduced (Collier and Hoeffler 2002), we find a negative effect of aid on events that aim at overthrowing the government. Moreover, since aid creates rents for those that hold political power (Angeles and Neanidis 2009), we find a positive effect on conflict events aiming at changing the regime. Forces that stand to gain from a change in the political regime, try to increase their political power, without necessarily

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changing the government, so as to expropriate the aid revenues. Hence, overall, there is a transfer of resources from types of conflict against the government to these types of conflict against the political regime. These findings are also accompanied by results that indicate, using the same *Fuzzy RDD,* that there is an increase in coups and autocratic regime transitions.

1.2   Concluding Remarks

To sum up, in the present thesis we seek to explore the causal role of institutions on state capacity. The role of cultural factors such as religion affects the development of institutions like fiscal capacity or the political regime type which in turn affect economic outcomes such as current account deficits. Also, institutions are also affected by rent seeking activities which are present in the existence of exogenous rents that individuals want to exploit.

In this thesis, we first examine the effect of the political regime type on current account balance and find that autocracies run more balanced current accounts. Second, we explore the effect of conflict between church and state on the development on fiscal institutions with our findings suggesting that conflict between church and state leads to a lower level of fiscal capacity. Last but not least, we explore the effect of foreign aid on domestic conflict. Our findings suggest that aid leads to an increase in types of conflict that aim to overthrow the political regime. Also, aid leads to autocratic regime transitions.

Overall, we explain the above relationships via the channel of institutions. As we show in all our research questions, institutions and various economic outcomes are causally related. We do not only examine the effect of institutions on economic

outcomes, but we also try to figure out some key determinants of institutions which in turn affect economic outcomes.

Chapter 2: Do democracies have higher current account deficits?

2.1 Introduction

There is an extensive literature on the determinants of current account imbalances (Chinn and Prasad 2003; Chinn and Ito 2007; Gruber and Kamin 2007; Imam 2008; Endegnanew et al. 2012 etc.) Most of these studies find that economic factors such as the net foreign asset position, the budget balance, the real effective exchange rate and the economic openness of the country are key factors affecting the current account position. This literature, however, seems to ignore the political institutions that may shape the external balance of the economy. The aim of the present study is to examine these forces by establishing a causal link between current account deficits and the political regime type. Specifically, we argue and establish an empirical relationship between the level of democracy and the current account deficit and show that more autocratic regimes deliver lower current account deficits than democratic ones do.

The effect of democracy on the external sector of the economy has been a subject of research in a number of studies. For example, Harms and Ursprung (2002), Adam and Filippaios (2007) and others have examined the effect of democracy on the flow of Foreign Direct Investments. The overall finding is that democracy increases FDI as long as FDI is not targeted towards the extraction of natural resources (Asiedu and Lien 2011). Similarly, there is a vast literature examining the effect of democracy on international trade. For example, Milner and Kubota (2005) and O'Rourke and

Taylor (2006) find that democratization results into more liberal trade policies in labor abundant countries: the now empowered median voter is a worker who, as the standard Heckscher-Ohlin model suggests, gains from free trade. Similarly, Yu (2010) argues that there are two competing channels through which democracy affects trade: firstly, a higher level of democracy is associated with a reduction of trade costs and an improvement of product quality, resulting to an increase in bilateral trade. At the same time, however, democracy is also associated with more trade barriers in the importing country. Using a gravity model, he finds that the former effect dominates and, thus, democracy increases exports. The present chapter draws on findings from this literature; however, it examines the effect of the political regime type on the current account balance instead of focusing on just one of its components. To our knowledge this is the first study that examines this relationship.

Since democracy affects the international flow of goods and capital, it is natural to expect that it will also affect the overall current account position. In Section 2 we justify theoretically our empirical model and derive our main testable hypothesis, i.e., that democracies tend to run (larger) current account deficits. Our arguments are as follows: Firstly, following Anderson (1988), we expect that dictators are more immune to public pressures compared to democratically elected politicians. Therefore, they are able to temporarily increase taxes or reduce the government expenditures without facing severe opposition by the general public. This implies that current account consolidations are more easily achieved in an autocratic environment. Secondly, the supply of foreign capital in autocracies will tend to be lower relative to democracies, as foreign investment is lower too. And even when there is a high capital inflow, this can be rather threatening for the survival of the regime (Kalyvitis and Vlachaki 2012): increased holdings of capital by foreigners will result into pressures on the dictator for

democratization. Consequently, dictators that fear such foreign pressures will try to use policies keeping the current account balanced in order to decrease the reliance on net foreign assets. Finally, following Rodrik (1999) we expect democracies to pay higher wages than autocracies. This results into a real effective exchange rate appreciation and, consequently, to higher current account deficits.

In order to empirically examine the above theoretical hypotheses and also to establish a causal relationship between democracy and the current account balance we estimate a Fixed Effects panel data model. Our sample consists of 121 countries over the period 1980-2012. All variables are expressed as five-year averages in order to eliminate the effect of short run fluctuations and in order to examine the long run causal effects of the political regime.

The dependent variable is the current account balance as percent of GDP and the rest of the explanatory variables are similar to Chinn and Prassad (2003). The main proxy of democracy is the Polity IV index of democracy, which provides the coding of the authority characteristics of states around the world and calculates various measures of how a country is governed from 1800 (or the year that the state gained its independence) onward. To examine the robustness of our results, we also employ the Freedom House index of democracy, which provides an index of the civil and political freedoms allowed by the political regime. Our main finding is that autocracies run lower current account deficits than democracies.

To get a first insight into the relationship between current account deficits and democracy, we present . This figure depicts the dynamics of the current account balance after a one (blue line) or two point (red line) increase in the Polity IV index. The figure indicates that, after an increase in the level of democracy at time zero, there is an

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associated decline on the average, current account balance across countries for up to ten years onward.

Even though the results of this graph are suggestive of an important negative effect of democracy on the current account balance, they do not capture the effect of other macroeconomic variables, or country specific fixed effects. Moreover, the figure shows that the long-run effect of a change in democracy is much higher than the short run one. For these reasons, our empirical results rely on a Fixed Effects panel data model on five-year averages.
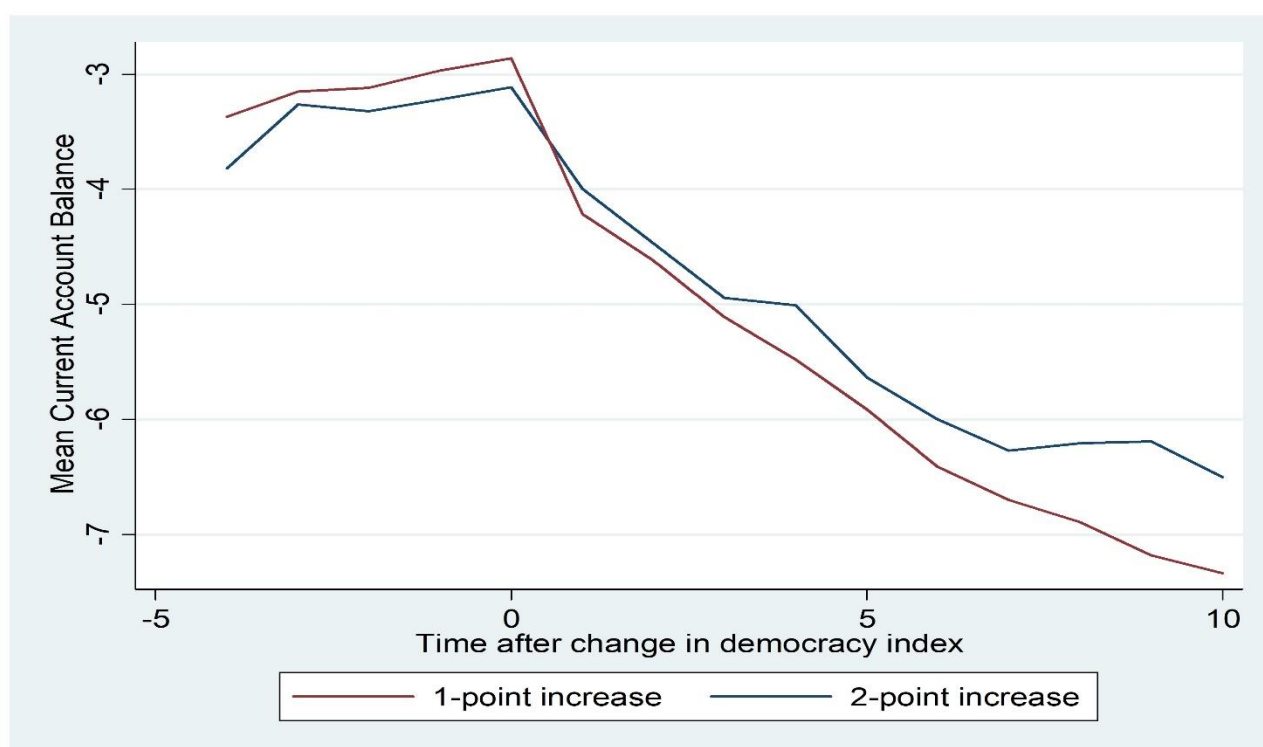
Figure 2.1: The effect of a change in democracy on the Current Account Balance

To further strengthen our results, we also provide a series of robustness checks in order to verify that the empirical results are robust to the country sample employed and the estimation method. As we are interested in the causal relationship between

democracy and the current account balance, we also perform an instrumental variable analysis to eliminate the existence of possible endogeneity. We use two instruments.

The first one is the share of Christian adherents in each country; according to Huntington (1993), Christianity played a key role on the democratization process during the third wave of democratization. This correlation is evident from just the simple correlation of this instrument with democracy (almost 50 percent). At the same time our data reveal a virtually zero correlation with the current account balance (correlation coefficient 0.001). Moreover, following Persson and Tabellini (2009) we use the average weighted democracy index of each country's neighbors. Following the literature, we expect a positive association between the Polity score of a country with its neighbors. This is consistent with the democratization waves theory of Huntington (1993) and the regional clusters of democracy and autocracy observed by Persson and Tabellini (2009).

The Instrumental Variables analysis verifies the negative relationship between Democracy and Current Account balance, while at the first stage we find a positive relationship between Christianity, Regional Democracy and the Polity variable. Similarly, all relevant tests indicate that our instruments are valid. Furthermore, a standard Durbin-Wu-Hausman test indicates weak evidence against the exogeneity of the democracy variable. We can, therefore, conclude that our results are robust. Finally, in the robustness section we perform a number of additional tests, verifying the theoretical channels through which democracy affects the current account balance.

The rest of this chapter is structured as follows: in Section 2, we elaborate on our hypothesis that more autocratic regimes face lower current account deficits relative to more democratic. In Section 3, we introduce the empirical methodology and the data.

The empirical results are presented in Section 4. In Section 5 we present the results of the instrumental variable analysis. Finally, Section 6 provides some concluding remarks.

2.2   Theoretical Framework

In this section, we try to explore the channel via which democracy affects the current account balance. We also explain why autocracies tend to run lower current account deficits relative to democracies.

According to Anderson (1988), autocracies are less sensitive to public pressures compared to democratic elected governments. Therefore, they are more likely to follow unpopular policies than their democratic counterparts. Following the literature on the economics of dictatorship (e.g., Wintrobe 2000; Robinson and Acemoglu 2006) the dictator maximizes a weighted social utility function placing more weight to an elite. In contrast to this, a democratic elected government, wishes to be reelected and, thus, places more weight on the wishes of the majority of the population (Acemoglu and Robinson, 2006). The underlying mechanism behind this effect stems from the fact that the cost of overthrowing a government in a democracy is lower than the associated cost in an autocracy, as the cost of voting is lower than the cost of a revolution (Tullock 1971; Apolte 2016). Therefore, democratic governments face more constraints in their choice of policies. Similarly, Brough and Kimenyi (1986) argue that the time horizon of a typical dictator is longer than that of a democratically elected politician. Also, Aidt and Jensen (2013) show that democratization leads to higher public spending directed to the creation of infrastructure and other productive spending as well as increased consumption. For example, after 1990, a large number of transition countries faced large current account deficits as public investment (and consumption) increased in their attempt to catch up with the rest of the (Western European) countries. In this respect,

the case of Germany is indicative; after reunification, Germany ran a current account deficit due to the substantial increase in domestic demand and investment requirements, even though current account deficits had been fairly rare in the years before 1990. Finally, Amin and Djankov (2014) show that authoritarian regimes may undertake painful reforms as they do not worry about the public opinion. This is consistent, also, with some historical accounts as the case of the Ceausescu regime in 1985 Romania, where strong austerity measures were introduced in order to fully repay all external debt.[2]

All the above imply that dictators can more easily impose the strict fiscal measures that a current consolidation requires. And even when currency depreciation is required in order to correct current account deficits, democratically elected governments also face huge losses in political support. According to Frankel (2005), large currency depreciations are associated with loss of support to the government and a higher probability of losing the elections.

What this discussion reveals is the tendency of the democratically elected governments to avoid large current account consolidations and postpone them until after the elections or after a new party comes into power (Alesina and Drazen 1991). In contrast, there are no such motives for dictators: they can easily impose fiscal measures or allow a large currency depreciation. Therefore, current account imbalances are not expected to exist for a large period of time in autocracies, since they are corrected more

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[2] These measures included for example the full exporting of all Romania's agricultural goods, which of course led to huge decline in the standard of living of the whole population (Mungiu-Pippidi 2001). In our sample the average current account balance over GDP for Romania before democratization run on 1.61 percent, implying a nonnegligible current account surplus. After the fall of communism and the democratization of the country the respective number to -6.1 percent. Even if we take the years after 2000, when democracy appears more consolidated, the average current account deficit in Romania is 1.41 percent of GDP.

easily than in democracies. In other words, we expect democracies to run larger current account deficits than dictatorships.

And even though dictators can more easily correct current account imbalances, they have more to fear from foreign indebtedness either in the form of government bond holdings, or more importantly, of foreign investment in the home economy. The accumulation of foreign assets leads to increased political power of foreigners who hold these assets (see Kalyvitis and Vlachaki, 2011). Since, typically, democracies put pressure on autocracies for democratic reform (Levitsky and Way 2010), dictators will not favor this increase in foreign power within the country. And as long as they can correct external imbalances either through fiscal measures or currency depreciation, they would refrain from large and extended current account imbalances that eventually lead to increases in foreign debt. But even if dictators have nothing to fear from the accumulation of foreign assets, sovereign lending markets imperfections may prevent domestic borrowing. In this case, it is not the decision of the dictator to not accumulate foreign debt, but the lower creditworthiness that constraints dictatorships from borrowing. Democracies tend to exhibit higher stability (e.g., Feng 1997), better protect property rights (e.g., Roe and Siegel 2011; Acemoglu et al. 2008) and have more developed financial markets (e.g., Bhattacharyya 2013). Democracies then are a safer place for foreign investment than dictatorships and are more able to attract foreign capital. For example, many foreigners want to invest in the United States, both in the private capital markets and by buying government bonds, because these are safer than investing in an economy where property rights are poorly protected. In all cases the end result is the same, i.e., dictatorships will run lower current account deficits.

The above argument can be related to a longstanding hypothesis that globalization promotes the diffusion of democratic ideas (Kant 1903; Shumpeter,1950;

Lipset 1959; Hayek 1978). Recent evidence verifies this relationship between openness and democracy, especially during the third wave of democratization (Papaioannou and Siourounis, 2008). According to this view, free trade and capital flows raise incomes and economic development, which in effect foster democratization by enhancing the efficiency of the resource allocation. Therefore, there are reasons to expect that autocratic regimes will favor restrictions to trade and capital flows and lower exposure to the global markets.

Finally, Rodrik (1999) has shown that democracies typically pay higher wages than nondemocracies, since the bargaining power of workers in the former case is higher relatively to the associated bargaining power in the latter. As a consequence, the prices of domestically produced products in democratic countries are higher, resulting into a real effective exchange rate appreciation. This, ultimately, suggests that ceteris paribus democracies will tend to have larger trade deficits.

All the above arguments point to the same theoretical hypothesis to be tested in the empirical section, i.e., that democracies run higher current account deficits than autocracies. The following sections establish that this is indeed the case.

2.3   Data

Our sample consists of 121 countries over the 1980-2012 period. All variables are expressed in five-year averages in order to eliminate the effect of short run fluctuations. The sample includes all countries for which data are available, excluding countries with an average (over the whole period) population of less than two million. As reported by Endegnanew et al. (2012), microstates display large changes in their current account balance, not related to changes in their economic policy but to the

external environment, and thus their current account is affected by other variables than those of larger countries.

Our dependent variable is current account balance as percent of GDP ($cab_{i,t}$), as taken from the IMF's World Economic Outlook database.[3]

Our main variable of interest is the *Democracy* variable which captures the level of democracy in each country. This variable is taken from the Polity IV database. The Polity democracy index focuses on the institutional structure of the political regime. The variable *Democracy* takes values from -10 to 10. A score of *Democracy* equal to -10 (+10) indicates a strongly autocratic (democratic) state. According to Polity IV, a democratic state has three essential characteristics. First, the political participation is fully competitive; second, institutionalized constraints on executive power are present; and third, civil liberties are secured. In contrast, an absence of these three characteristics typifies an autocratic country. According to our theoretical priors set in the previous section, we expect the sign of this variable to be negative as we believe that more democratic countries tend to have higher current account deficits. To verify that our results are not driven by the choice of the democracy index, we examine the robustness of our results by also using the Gastil democracy index (Freedom House, 2015). The difference between the Polity and the Freedom House indices is that the latter places more emphasis on the political and civil liberties, therefore, defining democracy in a rather non-minimalist way.

To correctly specify our model, we use a series of control variables consistent with the relevant literature (Chinn and Prassad 2003; Gruber and Kamin 2007; Chinn and Ito 2007; Imam 2008; Endegnanew et al., 2012). First of all, we use as proxy for

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3 Positive values of the variable imply current account surplus whereas negative ones imply deficit.

the fiscal balance the *Cyclically Adjusted Budget Balance*. To this end, we take the component of the Expenditure and Revenues (as percent of GDP) which is explained by the growth rate of the economy or a time trend. These data are obtained from IMF's, World Economic Outlook. Then, our variable is defined as the ratio of the Change in Cyclically Adjusted Revenue (percent of GDP) minus the Change in the Cyclically Adjusted Expenditure (percent of GDP). In line with Endegnanew et al. (2012), cyclical adjusted values are included in order to eliminate the common reaction to the business cycle. Following the twin deficits hypothesis, we expect the sign of this variable to be positive.

As the *Net Foreign Asset* position is the accumulation of past current account balances, we expect this variable to affect the current account position (Borensztein and Panizza 2009), even though the sign of the variable is a priori ambiguous. Economies with high Net Foreign Assets can afford to run trade deficits longer leading to lower current account balances. Conversely, a positive relationship may exist as higher Net Foreign Assets lead to higher net income flows (Imam, 2008). The variable is expressed as a share of GDP and is taken from the World Bank.

Following Masson et al. (1998) and in accordance with the standard life cycle model of savings, we expect an increase in the share of the youth and elderly population dependency ratio to lead to a ceteris paribus decrease on private savings. Therefore, we use the *Dependency Ratio* which is the proportion of the population under 18 years old plus population aged above 65 to total population. Hence, we expect the sign of this variable to be negative as a reduction in private saving reduces the current account balance.

Oil exporting countries generally run large current account surpluses and accumulate foreign assets during the extractive stage in order to smooth consumption once the nonrenewable resources have been exhausted (Adam and Moutos 2017). For this reason, we introduce the variable *Oil Rents* that measures the difference between the value of crude oil production at world prices and the total costs of production as a share of GDP. We expect the sign to be positive.[4] Following Chinn and Prasad (2003), we use the variable *Openness to Trade* defined as imports plus exports over GDP. This variable captures the fact that more open economies have the capacity to serve more easily their external debt, as they can generate foreign exchange earnings through exports, thus, leading to a higher current account balance. As a result, we expect the sign of this variable to be positive. The last three variables are taken from World Bank's World Development Indicators Database.

We also use a proxy for financial development by using the variable *Private Credit* as percent of GDP (also taken by World Bank's World Development Indicators Database) as a deviation of the world's average, as in Chinn and Ito (2007). The expected sign of this variable depends on whether the saving glut or the financial deepening hypothesis holds.[5] A positive relationship between private credit and the current account balance implies that the financial deepening hypothesis is correct. This happens as higher financial deepening, in the form of increased provision of financial services or increased money supply, induces higher saving leading to current account

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[4] Since we found *OilRents* to be highly correlated with *Democracy*, we made the two variables orthogonal by regressing *Democracy* on the share of Oil Rents to GDP and used the residuals as the variable *OilRents*. For the relationship between Oil endowments and dictatorship see also (Crespo Cuaresma et al. 2011).

[5] According to Chinn and Ito (2007) ...a global saving glut argument views excess saving from Asian emerging market countries, driven by rising saving and collapsing investment in the aftermath of the financial crisis (and to a lesser extent Europe), as the cause of the U.S. current account deficit... (Chinn and Ito, 2007, page 248).The financial deepening hypothesis on the other hand suggests that financial development leads to higher investment and, thus, to lower current account deficit.

surpluses. On the other hand, a negative relationship implies that the saving glut hypothesis holds, i.e. that current account imbalances are the outcome of excessive surpluses from oil exporting countries or savings from emerging market countries in the aftermath of financial crises (Chinn and Ito, 2007).

To control for changes in the price competitiveness vis-a-vis the rest of the world, we use the logarithm of the *Real Effective Exchange Rate* (as in Endegnanew et al.,2012). The sign of this variable is expected to be negative, as an increase in the real effective exchange rate implies a real depreciation which improves the external balance. Similarly, we include the *Real Effective Exchange Rate Volatility*, which is the five-year standard deviation in the *Real Effective Exchange Rate*. Higher volatility might increase precautionary savings and at the same time it also might also lead to lower investment. On this account, we expect a negative relationship between real effective exchange rate volatility and current account balance. The real effective exchange rate data are taken from Darvas (2012).

To take into consideration the level of development of each country we use the Real GDP per capita of each country divided by the Average World real GDP per capita (*Relative Income*). The standard neoclassical theory suggests that as long as capital is expected to flow from rich to poor countries, there must be a positive association between the current account balance and the relative income. However, according to the stages of development hypothesis, countries moving from a low to an intermediate level of development import capital and run current account deficits. Then, after reaching a threshold level of development, they become net capital exporters and run current account surpluses (Chinn and Ito, 2007). In line with this view, we can expect a U shaped relationship -or even a negative relationship- between $cab_{i,t}$ and relative

income.[6] Similarly, we include the *Growth Rate* of the real GDP per capita as we believe that higher growth rates may result into expectations for higher future income, in turn raising current consumption and, thus, leading to a reduction in the current account balance.

Finally, we proxy for financial openness using the variable constructed by Chinn and Prassad (2001), which measures *Financial Openness*. Lower capital openness can have two opposite effects: limited access to international capital resulting into lower current account deficits. On the other hand, restrictions to the flow of capital could re-affect attempts to defer the consequences of a legacy of chronic current account deficits. The variable is taken from Chinn and Ito (2015). Table 2-1 presents the analytical description of our data, the data sources, the summary statistics and also the expected signs of all variables.

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[6] In the tables that follow we present the results of a linear effect of relative income on $cab_{i,t}$. We have estimated the same model with a squared term and found that the non- linear effect turned out statistically insignificant. As this did not affect our main results, we opted for a linear specification regarding the relative income variable.

Table 2-1: Descriptive Statistics

Variable	Description	mean	Standard Deviation	Source	Expected Sign
Democracy	Proxy,for Democracy takes values from -10(full	2.20	6.97	Polity Project	(-)
Cyclically Adjusted Fiscal Balance	Policy induced changes in fiscal balance calculated as in Blachard (1990).	-0.10	2.72	World Bank Development Indicators	(+)
Net Foreign Assets	Assets held by foreigners in the domestic economy.	0.12	0.72	World Bank Development Indicators	ambiguous
Dependency Ratio	People younger than 15 or oder than 64 to the working age population	0.86	0.30	World Bank Development Indicators	(+)
Oil Rents	Measures the Rents a country recieves from oil production	0.46	0.30	World Bank Development Indicators	(+)
Openness to Trade	Imports+Exports as percent of GDP	83.30	48.67	World Bank Development Indicators	(-)
Financial openness	Index variable that codifies restrictions on cross-border	0.07	1.46	Chinn and Ito 2007	ambiguous
Private Credit as percent of Gdp	Private banks credit to the private sector as percent of GDP as a deviation from the	43.41	43.45	Beck et al.	ambiguous
Real Effective Exchange Rate	Real value of a country's currency against the value of a 3 year Moving	4.66	0.40	Darvas 2012	(-)
Real Effective Exchange Rate Volatility	Standard Deviation of REER.	29.17	421.30	Darvas 2012	(-)
Relative Income	real GDP of country i to a world weighted average real GDP	28.31	25.40	World Economic Outlook	(+)
Growth	Growth Rate	1.8	4.40	World Economic Outlook	(-)

The baseline specification used to study the relationship between current account balance and the political regime has the following form:

$$cab_{i,t} = aconstant + a_i + \lambda t + b1polity_{i,t} + b2nfa_{i,t} +$$
$$b3cyclbb_{i,t} + b4dependency_{i,t} + b5growth_{i,t} + b6oilrents_{i,t} +$$
$$b7openness_{i,t} + b8pcredit_{i,t} + b9reervol_{i,t} + b10reer_{i,t} + b11income_{i,t} +$$
$$b12kaopen_{i,t} + u_{i,t} \ (1)$$

where *cab* is the current account balance of country i at time t, *polity* is the democracy measure, *nfa* is the net foreign assets position, *dependency* is the dependency ratio, *growth* is the growth rate, *openness* is the openness to trade, *oilrents* is the amount of oil rents, *pcredit* is the private credit as percent of GDP, *reervol* is the real effective exchange rate volatility, *reer* is the log of real effective exchange rate, *income* is the relative income and *kaopen* is the financial openness. The terms a_i and λ_t denote the country fixed effects and the time fixed effects respectively. To ensure that we estimated the correct model, we also estimated a random effects model and applied a standard Hausman test which showed that the correct specification is the Fixed Effects model.[7] We also test whether the time effects are significant by performing an F test and find that the best model is the one with time effects. Therefore, our baseline model is a Fixed Effects model with country and time effects. Finally, as our interest lies more with the medium to long run determinants of current account balances, we estimate the model using five-year averages as in Chinn and Ito (2008).

[7] The Hausman for Fixed versus Random Effects is given in the last line of Table 2. The Random Effects model is clearly rejected in favor of the Fixed Effects model. [8]Which in our sample is equal to 6.6

2.4   Empirical Results

We start by estimating equation (1), using the data and the empirical methodology outlined in the previous section. The results are reported in Table 2-2.

Column (1) presents the baseline specification, where we estimate a panel data equation with time and country fixed effects. As can be seen, the political regime has a strong negative relationship with the current account balance. This verifies our theoretical priors, i.e., that democracies tend to run higher current account deficits. Also, the coefficient of the variable suggests that the quantitative effect of democracy on the current account balance is nonnegligible: a one standard deviation increase in *Democracy* is associated with a three percent point decline in the current account balance.[8]

Regarding the rest of the control variables, Private Credit (as percent of GDP) has also a negative relationship and a statistically significant effect on current account balance. This is consistent with the saving glut hypothesis (Chinn and Ito, 2007) as highlighted in the previous section. Similarly, the Real Effective Exchange Rate has a significant negative effect on the current account balance at the 10 percent level of statistical significance, suggesting that an increase in real effective exchange rate makes imports more expensive and exports cheaper, thus, exerting a negative effect on the current account balance. *OilRents* also enter with an expected positive and statistically significant sign (at the one percent level of significance), which suggests that oil producing countries tend to run higher current account surpluses. This latter effect is quite large in size as a one percent increase in the oil rents is associated with a one percent higher current account balance.

Relative income appears to have a negative effect on current account balance. This effect provides evidence in favor of the stages of development hypothesis. However, as this effect is rather small quantitatively, i.e., a one percent increase in the relative income for the country results in a 0.04 percent reduction in the current account balance and not consistently significant in all estimations, we cannot place much confidence in this result. Finally, the budget balance has a strong positive effect on current account balance. This is consistent with a large number of studies (see, for example, Bussiere and Fratzscher 2006; Ca' Zorzi and Rubaszek 2008) which and a positive association between current account balance and fiscal balance. A higher budget deficit, results into capital inflows, current account deficits and redistribution from future to current generations (Obstfeld and Rogoff 1995).

The rest of the variables are found to be statistically insignificant. Nonetheless, with the exception of the variables *Openness to Trade* and *Real Exchange Rate Volatility* these variables have the expected signs.

In columns (2) to (5) of Table 2-2 we re-estimate the baseline equation presented in column (1): (i) without time effects (column 2), (ii) assuming Random Effects (column 3), (iii) using a simple OLS (column 4) with time effects, (iv) with OLS without time effects (column 5).[8]In all cases the effect of *Democracy* on the current account balance remains negative and statistically significant (at least at the 10 percent level of statistical significance). With respect to the rest of the variables, the only

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[8] We have also estimated our baseline model in an annual dataset and found the same effect of polity to the one percent level of statistical significance. These results are available from the authors.

Table 2-2: Baseline results

	(1) Baseline	(2) No Time Effects	(3) Random Effects	(4) OLS	(5) OLS No Time Effects
Democracy	-0.660***	-0.556***	-0.161**	-0.112*	-0.125*
	(-5.57)	(-5.11)	(-2.25)	(-1.69)	(-1.87)
Cyclically Adjusted Budget Balance	0.483***	0.534***	0.602***	0.645***	0.597***
	(3.02)	(3.37)	(3.75)	(3.13)	(2.89)
Net Foreign Assets	1.689	2.152	4.171***	6.688***	7.045***
	(1.02)	(1.24)	(2.93)	(4.49)	(4.64)
Dependency Ratio	-0.194	0.510	-0.404	-1.877*	-1.440
	(-0.17)	(0.52)	(-0.38)	(-1.88)	(-1.45)
Growth Rate	-0.259	-0.232	-0.208	-0.247*	-0.293**
	(-1.50)	(-1.49)	(-1.50)	(-1.68)	(-2.01)
Oil rents	0.931***	0.923***	0.432***	0.381***	0.365***
	(5.66)	(5.91)	(5.67)	(6.99)	(6.82)
Openness to Trade	-0.0305	-0.0243	0.000210	0.0103	0.00701
	(-1.05)	(-0.87)	(0.01)	(1.14)	(0.77)
Private Credit of GDP	- 0.0326**	-0.0180*	0.0197**	0.0438***	0.0394***
	(-2.30)	(-1.67)	(2.08)	(5.95)	(5.60)
Real Effective Exchange Rate Volatility	0.00439	0.00692	0.0124	-0.00362	0.00227
	(0.27)	(0.44)	(0.84)	(-0.23)	(0.15)
Real Effective Exchange Rate	-2.756*	-4.074***	-2.789**	0.601	0.151
	(-1.72)	(-2.99)	(-2.42)	(0.50)	(0.13)
Relative Income	-0.0391*	-0.0276*	0.00305	0.0148	0.0322***
	(-1.83)	(-1.89)	(0.25)	(1.08)	(2.85)
Financial Openness	-0.312	0.162	0.296	0.267	0.240
	(-0.69)	(0.39)	(0.88)	(1.02)	(0.94)
Observations	494	494	494	494	494
R2	0.326	0.295	0.345	0.412	0.399
F- test	8.470	5.496		11.37	15.73
F-test Country Effects	5.91	5.80			
F-test Time Effects	3.80			2.43	
Hausman Test (FE versus RE)	61.00				

Note: clustered t-statistics in parentheses. F-test is the F test for the significance of the model. F-test country and time effects denote F-test for statistical significance of the Country and Time Fixed effects respectively. Hausman Test (FE versus RE) denotes the standard Hausman test for Fixed versus Random Effects. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

important changes are in the *Private Credit of GDP* and *Relative Income*, which both change sign and remain statistically significant. The literature so far has for both variables inconclusive results. What we find here is that the empirical result is heavily dependent on the estimation method. However, since the Fixed Effects model is (i) the correctly specified model according to the specification tests and (ii) it estimates the within variation in the data thus capturing the causal relationship between the independent and dependent variables (1) , we have more confidence on the of column (1).

To further explore the robustness of our results, in Table 2-3 we re-estimate the baseline Fixed Effects equation by excluding countries that are a priori expected to potentially affect our main finding. In columns (1) to (3) we examine whether the effect of the regime on current account is driven by the extreme values of *Democracy* in our sample. Thus, in column (1) we estimate our baseline equation by excluding from our sample countries that achieve a Polity IV score of 10 or below minus nine. We do so since these are the extreme values of the *Democracy* index in our sample.[9] In column (2) we exclude only countries where their Polity IV score takes the minimum value, i.e. minus nine and finally, in column (3) we exclude countries that achieve the maximum Polity IV score, i.e., 10. As we can observe, our main variable of interest remains negative and statistically significant at the one percent level of statistical significance. Moreover, most of the variables retain their sign and significance, with the exception of the real effective exchange rate and relative income variables which become insignificant. [10]

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9 There are no instances of countries with a polity score of minus 10.
10 This may be attributed to the significant decline in the observations.

Table 2-3:Sensitivity analysis I

	(1) Polity >-9&<10	(2) Polity >-9	(3) Polity<1	(4) Exclude Richest and Poorest 10%	(5) Exclude Richest and Poorest 5%	(6) Exclude Communist
Democracy	-0.585***	-0.634***	-0.597***	-0.511***	-0.639***	-0.591***
	(-4.47)	(-5.20)	(-4.72)	(-3.41)	(-4.90)	(-4.91)
Cyclically Adjusted Budget Balance	0.753***	0.525***	0.677***	0.398**	0.604***	0.542***
	(3.50)	(3.08)	(3.37)	(2.51)	(3.42)	(3.18)
Net Foreign Assets	-0.328	1.868	-0.439	0.971	2.379*	0.999
	(-0.15)	(1.08)	(-0.21)	(0.51)	(1.72)	(0.56)
Dependency Ratio	0.415	0.267	-0.350	0.292	-0.428	0.178
	(0.32)	(0.24)	(-0.26)	(0.21)	(-0.37)	(0.17)
Growth Rate	-0.331*	-0.341*	-0.238	-0.253	-0.237	-0.370*
	(-1.71)	(-1.98)	(-1.22)	(-1.25)	(-1.19)	(-1.91)
Oil rents	0.979***	0.962***	0.949***	0.785***	0.874***	0.944*
	(5.33)	(5.38)	(5.56)	(4.45)	(5.04)	(5.86)
Openness to Trade	-0.0415	-0.0239	-0.0506	-0.0399	-0.0361	-0.006
	(-1.22)	(-0.85)	(-1.45)	(-0.94)	(-1.10)	(0.25)
Private Credit of GDP	-0.0593**	-0.0369**	-0.0497*	-0.0649***	-0.0622***	-0.031**
	-(-2.10)	(-2.49)	(-1.85)	(-3.81)	(-4.11)	(-2.13)
Real Effective Exchange Rate Volatility	-0.0104	-0.00450	-0.00133	-0.116*	0.00257	0.002
	(-0.72)	(-0.29)	(-0.09)	(-1.73)	(0.16)	(0.02)
Real Effective Exchange Rate	-0.377	-0.736	-2.900*	-4.102**	-2.308	-1.43
	(-0.16)	(-0.37)	(-1.79)	(-2.39)	(-1.37)	(-0.63)
Relative Income	-0.0443	-0.0354	-0.0504	-0.0357	-0.0305	-0.022
	(-1.32)	(-1.60)	(-1.55)	(-1.00)	(-1.07)	(-1.29)
Financial Openness	-0.219	-0.445	-0.0831	-0.673	-0.298	-0.602
	(-0.34)	(-0.95)	(-0.14)	(-1.20)	(-0.58)	(-1.27)
Observations	351	479	366	340	438	422
R2	0.368	0.323	0.367	0.386	0.353	0.360
F-test	5.841	7.394	7.022	7.535	8.014	8.70
F-test Country Effects	5.46	5.92	5.42	5.08	5.53	6.82
F-test Time Effects	2.54	4.53	1.80	2.64	3.51	4.17

See notes in table 2

In column (4) we estimate our model by excluding the richest and the poorest countries. Specifically, we exclude countries with GDP per capita at the lowest and highest 10 percent (column 4) and 5 percent (column 5) in the sample. The reason we do this is that we want to reject the probability that extreme values of GDP drive the result of the regime type on current account balance. As can be observed, *Democracy* remains statistically significant at the one percent level, implying that our relationship is very strong. The other variables have similar signs as those in our baseline model except from slight differences which may occur because of the change in observations.

Finally, in column (6) we exclude countries which were communist and democratized. We believe that in these countries current account deficits are a result of the huge amounts of infrastructure investment and private consumption that was needed to be financed using foreign funds and goods. So, we want to be sure that our results are not driven by those countries. It is obvious that in column (6) this is not the case. The coefficient of democracy remains statistically significant at the one percent level.

In Table 2-4 we re-estimate our model by using additional control variables. In column (1) we use the Freedom House index as proxy for democracy. We do so in order to ensure that the effect of the regime type on current account balance is not related to a specific democracy index employed (in this case Polity IV) but it remains even if we use other measures of democracy. As can be observed, the effect of democracy is again statistically significant at the one percent level and all the other variables have similar coefficients and same signs as in our baseline model[11] In columns (2) to (5) we re-

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11 The only exception to the above statement being the variables which measure the Real Effective Exchange Rate and the Private Credit as percent of GDP.

estimate our model by using additional control variables. In column (2) we replace the real effective exchange rate volatility with terms of trade volatility and in column (3) we re-estimate our model by using log GDP per capita instead of relative income. In column (4) we employ the debt as percent of GDP instead of cyclically adjusted fiscal balance. Finally, in column (5) we exclude from our sample all the oil exporting countries. As discussed earlier, the oil exporting economies face high current account surpluses and accumulate foreign assets during the extractive stage in order to smooth consumption once the nonrenewable resources have been exhausted. For these economies, the evolution of the current account in addition to being affected by oil prices may be affected by intended fluctuations in their production in order to stabilize the global oil market rather than any particular concern about their external position (IMF, 2013). Furthermore, oil exporting countries may face the effect of the natural resource curse associated with weak institutions and excessive rent seeking (Torvik, 2006; Robinson et al., 2006). Therefore, one can claim that our results may be driven by this effect but, as we can observe, this is not the case.[12] In all five columns the effect of the political regime on current account balance remains significant at the one percent level.

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12 Although the coefficient is half in size, we can't reject the hypothesis that the two coefficients are not equal because the estimated confidence intervals are overlapping.

Table 2-4: Sensitivity Analysis I

	(1) Freedom House Democracy	(2) Terms of TradeVolatility	(3) GDP per Capita	(4) Fiscal Balance	(5) Oil Rents
Freedom House	-13.37***				
	(-4.35)				
Cyclically Adjusted Budget Balance	0.502***	0.500**	0.467***		0.351
	(3.12)	(2.60)	(2.80)		(1.408)
Net Foreign Assets	1.187	1.127	1.223	0.898	-1.265
	(0.69)	(0.62)	(0.67)	(0.55)	(-0.388)
Dependency Ratio	-0.487	-1.065	-0.231	-0.429	-0.357
	(-0.41)	(-0.96)	(-0.23)	(-0.36)	(-0.34)
Growth Rate	-0.232	-0.239	-0.322*	-0.188	0.009
	(-1.34)	(-1.35)	(-1.84)	(-1.00)	(0.058)
Oil rents	0.832***	0.905***	0.946***	0.955***	0.954***
	(5.20)	(4.28)	(5.74)	(6.52)	(4.35)
Openness to Trade	-0.0273	-0.0230	-0.0310	-0.0295	0.026
	(-0.96)	(-0.77)	(-1.06)	(-0.92)	(0.785)
Private Credit of	-0.0229	-0.0312**	-0.0391***	-0.0361**	-0.006
	(-1.65)	(-2.29)	(-2.69)	(-2.41)	(-0.225)
Real Effective Exchange Rate Volatility	0.00410		0.00571	-0.134**	0.072
	(0.25)		(0.40)	(-2.02)	(0.735)
Real Effective Exchange Rate	-2.784	-.126**	-2.689*	-3.373*	-2.509
	(-1.53)	(-2.23)	(-1.66)	(-1.88)	(-1.390)
Relative Income	-0.0405*	-0.0485**		-0.0496**	-0.062**
	(-1.90)	(-2.15)		(-2.01)	(-2.184)
Financial Openness	-0.319	-0.257	-0.417	-0.130	0.148
	(-0.72)	(-0.55)	(-1.01)	(-0.24)	(0.252)
Democracy		-0.594***	-0.639***	-0.668***	-0.257**
		(-4.72)	(-5.26)	(-4.16)	(-2.266)
Terms of trade volatility		-8.57e-14			-7.45e-14
		(-1.16)			(-1.41)
Gdp Per Capita			2.168		2.221
			(1.54)		(1.52)
Fiscal Balance				0.00587	0.00476
				(0.44)	(0.25)
Observations	490	451	490	445	229
R2	0.311	0.323	0.329	0.359	0.273
F- test	7.954	.	8.407	8.977	5.15
F-test Country effects	5.73	6.07	5.50	5.91	8.00
F-test Time Effects	2.90	4.27	4.28	3.42	4.31

See notes in table 2.

In Table 2-5 we provide additional robustness checks. First, in column (1) we re-estimate our main model using lags for the main macroeconomic variables. This will help us deal with potential reverse causality of the current account with respect to the macroeconomic control variables. The effect of the latter might indeed be wrongly estimated due to reverse causality, which in the case of multicollinearity could produce an incorrect estimate for the right-hand side variable of interest. As the reader can easily verify, there are only minor changes in our main variable of interest, i.e., *Democracy*, which once again remains negative, statistically highly significant and has a similar magnitude as in the rest of the tables. However, the rest of the macroeconomic variables either lose significance (variables *Private Credit as percent of GDP*, *Real Effective Exchange Rate*) or have a non-expected sign (*Cyclically Adjusted Fiscal Balance* becomes negative which is not reasonable due to the twin deficit hypothesis, and *Real Effective Exchange Rate Volatility* becomes positive implying that higher volatility might lead agents to save less or it might lead to higher investment). There is abundant literature (see for example Mesquita et al. 1999) showing that autocratic regimes are more likely to engage in conflict. At the same time, conflicts might result into current account deficits. If we follow this argument, it may be the case that Conflicts and similarly sanctions, which are a form of nonmilitary conflict, (see Cox and Drury 2006; Adam and Tsarsitalidou 2019) are a confounding factor. Then, conflicts rather democratization might drive the result. Thus, in columns (2) and (3) we control for the effect of conflicts and sanctions. The variable *Conflict* is a dummy constructed from the Correlates of War Database and takes value one when a country is engaged to an armed conflict (civil war or intra state war) and zero otherwise. The variable *Sanctions* is a dummy variable taken from Morgan et al. (2014) and these are the sanctions imposed by international organization during the period of interest. In columns (2) and (3) of

Table 2-5, we examine the robustness of our results by including these two variables. In column (2) we have estimated our baseline equation adding *Conflict* as a control and in column (3) we have added both *Conflict* and *Sanctions*. The variable *Conflict* is statistically insignificant in both columns, while variable *Sanctions* is statistically significant at the five percent level of statistical significance. However, the effect of *Democracy* remains qualitatively unchanged. Therefore, we can conclude that the results are not driven by the fact that autocracies are more prone to conflict. Even though we use five-year averages, a high degree of persistence in the Current Account balance might still exist. In column (4) we estimate a dynamic panel data model as an additional robustness test. As the lagged dependent variable Fixed Effects regression is by construction biased, we have used the Bootstrap Corrected Fixed Effects estimation by Everaert and Pozzi (2007) who extend the correction of Kiviet (1995). Still using a lagged dependent variable model, our results regarding *Democracy* remain unchanged. The estimated coefficient of the lagged dependent variable is statistically significant and equal to 0.435. This indicates that indeed some degree of persistence still exists in our data. Moreover, it implies that the long run effects identified so far might be somehow higher. In columns (5) and (6) we control for the type of the Exchange Regime to determine whether this changes our main results. We used the coarse classification by Ilzetzki et al. (2017), and we constructed a dummy variable that takes the value of one when the exchange regime is floating and zero otherwise. In column (5) we controlled for the exchange regime type. The results suggest that the regime type has a statistically insignificant effect on the level of the current account balance.

Table 2-5: Sensitivity analysis III.

	(1) Lagged Macro Variables	(2) Conflict	(3) Conflict/ Sanctions	(4) Lagged Dependent	(5) Exchange Rate Regime	(6) Exchange Rate Volatility
Democracy	-0.421***	-0.660***	-0.679***	-0.612***	-0.606***	-0.611***
	(-3.51)	(-5.28)	(-5.16)	(-4.89)	(-5.88)	(-5.80)
Cyclically Adjusted Budget Balance	-0.241*	0.483***	0.483***	0.476**	0.366**	0.370***
	(-1.71)	(3.05)	(3.03)	(4.06)	(2.61)	(2.64)
Net Foreign Assets	-1.779	1.684	1.703	1.369	1.468	1.445
	(-0.95)	(1.02)	(1.06)	(0.92)	(0.90)	(0.89)
Dependency Ratio	0.971	-0.199	-0.086	0.101	-0.359	-0.354
	(0.74)	(-0.18)	(-0.08)	(0.09)	(-0.29)	(-0.29)
Growth Rate	-0.0779	-0.260	-0.260	-0.256	-0.331*	-0.332*
	(-0.49)	(-1.49)	(-1.52)	(-2.34)**	(-1.70)	(-1.71)
Oil Rents	0.625***	0.931***	0.935***	0.855***	0.886***	0.883***
	(3.25)	(5.65)	(5.83)	(7.90)	(5.36)	(5.33)
Openness to Trade	0.0530*	-0.0306	-0.0320	-0.025	-0.0291	-0.0292
	(1.77)	(-1.05)	(-1.05)	(-1.13)	(-1.13)	(-0.97)
Private Credit of Gdp	0.0117	-0.0326**	-0.0360**	-0.030**	-0.0438***	-0.0437***
	(0.94)	(-2.30)	(-2.45)	(-2.14)	(-2.85)	(-2.83)
Real Effective Exchange Rate Volatility	0.0147*	0.00439	0.00384	-0.016	0.00673	0.0104
	(1.74)	(0.27)	(0.19)	(-1.14)	(0.64)	(0.65)
Real Effective Exchange Rate	-0.161	-2.757*	-2.404	-4.258**	-0.951	-1.213
	(-0.08)	(-1.72)	(-1.55)	(-2.45)	(-0.52)	(-0.59)
Relative Income	-0.00891	-0.0391*	-0.041**	-0.042**	-0.0358	-0.0361
	(-0.32)	(-1.82)	(-1.90)	(-2.62)	(-1.56)	(-1.57)
Financial Openness	-0.506	-0.313	-0.282	-0.285	-0.652	-0.641
	(-0.96)	(-0.69)	(-0.63)	(-0.70)	(-1.47)	(-1.45)
Confliict		-0.0622	0.251			
		(-0.06)	(0.26)			
Sanctions			-1.758**			
			(-2.47)			
Lagged Cab				0.435***		
				(10.069)		
Exchange Rate Regime					0.851	0.910
					(1.26)	(1.32)
Exchange Rate Regime*Volatility						-0.008
						(-0.67)
Observations	401	494	494	464	464	464
R2	0.192	0.326	0.332	0.3436	0.309	0.310
F-test	4.790	9.495	8.94	9.74	7.799	9.080
F-country effects	5.97	5.85	5.92		6.16	6.14
F-time effects	2.90	3.76	3.70		5.47	5.71

See notes in table 2.

Also, in column (6) we have also used the interaction term *Regime∗Real Effective Exchange Rate Volatility* as a control variable. We expect a highly volatile Real Effective Exchange Rate to create more current account balance problems in fixed exchange rate regimes. However, as the results of column (6) indicate it appears that Real Effective Exchange Rate Volatility has no heterogeneous effect on the current account balance across exchange rate regimes. Interestingly, what both columns suggest is that our main relationship between *Democracy* and *Current Account* remains intact.

A final robustness analysis is presented in Table 2-6, where we perform a Jackknife analysis (Efron and Tibshirani (1993). This method involves estimating the initial equation by excluding in each replication one cross sectional unit (country). In this table we report the maximum and the minimum estimated coefficients, as well as the excluded countries that exert this extreme identified impact. Comparing these coefficients with the ones presented in Table 2-2, we can conclude that our results are robust to the exclusion of particular countries.

As the reader can easily verify, the effect of *Democracy* on the current account balance is not sensitive to the exclusion of a particular country from the sample as the coefficient ranges from a -0.70 (with the exclusion of Indonesia) to -0.60 (with the exclusion of Sudan). These two values are within the confidence interval of the baseline results (column (1) of Table 2-2.

Furthermore, the variables found to be significant in the baseline model do not change signs in the Jackknife estimation. It is interesting also to note that the variable *Real Exchange Rate Volatility*, with the exclusion of Ghana from the sample, becomes marginally statistically significant and correctly signed, contrary to the baseline results.

Table 2-6:Jackknife Estimations

	Country	Min Coef.	Country	Max Coef.
Democracy	Indonesia	-0.70***	Sudan	-0.60***
Cyclically Adjusted Fiscal Balance	Sudan	0.38***	Ireland	0.55***
Net Foreign Assets	Ghana	1.03	Liberia	3.07***
Dependency Ratio	Jamaica	-0.63***	Azerbaijan	0.30
Growth Rate	Paraguay	-0.33*	Chile	-1.68
Oil Rents	Sudan	0.83***	Nigeria	0.99***
Openness to Trade	Ireland	-0.40***	Azerbaijan	-0.02
Private Credit as Percent of GDP	Israel	-0.04	Portugal	-0.03**
Real Effective Exchange Rate Volatility	Ghana	-0.10*	Sudan	0.13
Real Effective Exchange Rate	Ghana	-3.55**	Uzbekistan	-1.22
Relative Income	Ghana	-0.49**	Azerbaijan	-0.24
Financial Openness	Azerbaijan	-0.46	Malaysia	-0.07

2.5 Instrumental Variables Analysis

In order to ensure that our results are not driven by endogeneity, in this section we employ an instrumental variable analysis. Endogeneity can be an important issue since it is possible that higher exposure to international markets, associated with increased current account deficits, may also lead to greater democracy. In other words, it may be argued that the correlation outlined in the previous section is not the outcome of a causal relationship but the outcome of another variable affecting Democracy and the Current Account Balance alike. Endogeneity among the variables may render all our previous results invalid. To avoid this, we resort to instrumental variables analysis.

To determine our instrument, we follow Huntington (1993), who argues that Christianity was a key factor in the democratization process, as the clergy played an important role against authoritarian regimes. According to his historical account, in many countries Christian leaders encouraged coups against authoritarian regimes during the second and the third wave of democratization. This is attributed to the esoteric democratic message provided by Christianity and the fact that in most cases the Christian church -at least in the period from 1945 onward- had a more distinct role from the state. Additionally, Huntington pointed to the fact the Protestant church played a key role in the democratization process, for the reason that its structure is more democratically organized and, thus, has a natural tendency to promote the democratic structure of governance.

Following the above discussion, our main instrument is the share of all Christian adherents to Total Adherents. The variable is taken from the cross-country World

Religion Data set.[13] The World Religion Dataset provides data on religious adherence worldwide from 1945 onward. The dataset first creates a detailed religion tree, classifying all religions and religious families. It, then, uses census data or data from specific sources in order to consistently compute the total number of adherents in each religious family for each country (see Maoz and Henderson 2013 for more details). The correlation of this variable with *Democracy* is close to 50 percent. Interestingly enough, the share of Christian adherents has a 0.01 correlation coefficient with the current account balance. Therefore, it appears a-priori as a valid instrument.[14]

Also, according to Huntington (1993) and the democratization in waves concept as well as Persson and Tabellini (2009) and the foreign democratic capital theory, we also use the level of democracy of the neighbors of each country as an instrument in each year. Both theories suggest that there is a strong positive correlation between the polity in a country and the polity in its neighbors. Therefore, we construct a variable as follows:

$$Z_{i,t} = \frac{\sum_{j \neq i} W_{ij} L}{\sum_{j \neq i} W_{ij}}$$

Where $W_{i,j}$ is the inverse distance in kilometers of capital cities of countries i and j and $D_{j,t}$ is the measure as determined by the polity score of country j at time t.

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[13] As available online on http://www.thearda.com/Archive/Files/Descriptions/WRDNATL.asp

[14] As we have a Fixed Effects IV model the instrument must exhibit high within variation. The within standard deviation of the share of Christian adherents variable in our sample is 0.15 with an associated coefficient of variation equal to 0.3056. When we performed a t- test it turned out that we can reject the hypothesis of a zero Coefficient of Variation at the one percent of statistical significance, therefore we do not have enough evidence that there is no variability in the instrument.

As final instrument we use the lagged values of *Democracy*. Furthermore, we experiment with the share of non-religious adherents- to verify the robustness of our results.[15]

Table 2-7 presents the results from the IV estimations. In column (1) the only instrument is the share of Christians in the country. As can be easily observed, in the first stage this variable has a positive effect on *Democracy* consistent with the above theoretical reasoning. What is more interesting is the fact that in the second stage regression the effect of *Democracy* remains negative and statistically significant at the one percent level of statistical significance. Additionally, the instruments used are found statistically significant at the first stage, and we cannot reject the overidentifying restrictions. This leads us to conclude that the instruments used are valid. Finally, one should note that even though the Durbin-Wu-Hausman test provides evidence of endogeneity only at the five percent level of significance, suggesting there are valid reasons to argue for a reverse causality among *Democracy* and the current

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15 We have examined other instruments along the same line as well, for example the share of protestants, share of Jewdish adherents etc. In all cases the correlation coefficient with Democracy was rather lower than the instruments used here. More importantly all tests for the validity of instruments rejected the use of this latter set of instruments.

Table 2-7: Fixed effects Instrumental Variables estimations

	(1) Instr.Christians	(2) Instr. Christians Democracy (-1)	(3) Instr. Democracy (-1) Christians Neighboor Democracy	(4) Instr. Democracy (-1) Neighbor democracy	(5) Instr. nonreligious Democracy (-1) Neighbor Democracy
Democracy	-1.656***	-1.427***	-1.288***	-1.298***	-1.268***
	(-3.11)	(-3.64)	(-3.58)	(-3.50)	(-3.48)
Cyclically Adjusted	0.406***	0.411***	0.427***	0.426***	0.428***
Balance	(2.67)	(2.87)	(3.01)	(3.00)	(3.02)
Net Foreign Assets	2.712*	1.466	2.543*	2.545*	2.538*
	(1.89)	(1.03)	(1.94)	(1.94)	(1.94)
Dependency Ratio	-0.922	-0.498	-0.362	-0.366	-0.354
	(-0.85)	(-0.47)	(-0.34)	(-0.35)	(-0.34)
Growth Rate	-0.207	-0.299*	-0.294*	-0.294*	-0.293*
	(-1.19)	(-1.68)	(-1.66)	(-1.66)	(-1.66)
Oil rents	1.138***	1.058***	1.042***	1.044***	1.038***
	(4.99)	(5.21)	(5.16)	(5.17)	(5.14)
Openness to trade	-0.0247	-0.0308	-0.0323	-0.0324	-0.0323
	(-0.96)	(-1.21)	(-1.25)	(-1.25)	(-1.25)
Private credit	-0.0323**	-0.0511***	-0.0471***	-0.0473***	-0.0467***
as percent of gdp	(-2.23)	(-3.09)	(-2.96)	(-2.96)	(-2.94)
Real Effective	-0.0164	-0.0327	-0.0308	-0.0310	-0.0304
Exchange Rate	(-0.82)	(-1.31)	(-1.22)	(-1.22)	(-1.20)
Real Effective	-3.936**	-4.420**	-4.230**	-4.234**	-4.221**
Rate Volatility	(-2.55)	(-2.12)	(-2.03)	(-2.03)	(-2.03)
Relative Income	-0.0622***	-0.0461**	-0.0436**	-0.0436**	-0.0437**
	(-3.31)	(-2.31)	(-2.20)	(-2.20)	(-2.20)
Financial Openness	0.00501	-0.468	-0.411	-0.413	-0.407
	(0.01)	(-1.10)	(-0.97)	(-0.97)	(-0.96)
First stage					
Share of Christians	9.30***	5.38***	4.14**		
	(3.32)	(2.65)	(1.95)		
Lagged Democracy		0.30***	0.29***	0.25***	0.30***
		(5.14)	(5.62)	(5.13)	(5.34)
Neighboor Democracy			0.72**	0.8**	0.78**
			(2.21)	(2.41)	(2.39)
Share of nonReligious					-2.16
Observations	489	469	463	463	463
R2	0.154	0.262	0.290	0.288	0.293
F-test	4.206	4.567	5.021	5.010	5.038
DWH	4.328**	6.073**	4.907**	7.30 ***	3.834**
Kleibergen-Paap Wald	16.552***	40.763***	28.792***	41.246***	27.714***
F-test Instr.	11.02**	19.62***	13.26 ***	18.44***	13.09 ***
Hansen Test		0.012	0.399	0.037	3.027
Hansen Test (p-value)		0.91	0.81	0.84	0.22

Notes: clustered t-statistics in parentheses. To save space we do not report the first stage results for the exogenous variables, which are included in the first stage regresson. Country and time fixed effects are also included in the model.F-test is the F test for the significance of the model. DWH is the Durbin- Wu- Hausman Test of endogeneity of the regressors. Rejection of the null suggests that the IV regression is required. Kleibergen-Paap Wald test is a weak identification test for the model. Null hypothesis indicates that the model is weak identified. F-test Instr. denotes the test for excluded instruments. Hansen test is the Hansen test for overidentifying restrictions. * p<0.10, ** p<0.05, *** p<0.01.

account balance, there are not conclusive (statistical) evidence to reject the simple Fixed Effects model of the previous section.

In the rest of the columns in Table 2-7, we examine the robustness of the IV regression by experimenting with additional instruments. Firstly, in column (2) we add the lagged *Democracy* variable, then in column (3) we use the share of Christians, the lagged democracy and the democracy in neighboring countries as instruments. In column (4) our instruments are the lagged and the democracy of neighboring countries and, finally, in column (5) we do the same as in column (4) but we also use the share of non-religious adherents as an instrument.

The results suggest that the instrumental variable analysis is robust and give us strong empirical evidence that the political regime and the current account balance of a county are indeed associated. More specifically, in column (2) we add the lagged variables of democracy. The sign of this variable at the first stage is positive and statistically significant at the one percent level of statistical significance as expected. At the same time, the second stage gives us a statistically significant and negative relationship between the regime type and the current account balance. In column (3), it is obvious from the first stage that the democracy of the neighboring countries affects positively the level of democracy of a country. This is consistent with the theory that suggests that a country's level of democracy depends on the level of democracy of its neighbors. Our main interest here is the second stage and the relationship between democracy and the current account balance. As can be noted, although we used an additional instrument and not only the level of Christianity, our negative relationship remains strong at the one percent level of statistical significance. Furthermore, in column (4) we exclude the share of Christians using as instruments only the lagged democracy and the democracy of the neighboring countries. We do so in order to ensure

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that it is not the share of Christians that drives our results. It is evident that the latter does not happen. As can be observed, the strong relationship between the level of democracy and the current account balance remains significant at the one percent level with the coefficients of both models to be similar.

Finally, in column (5) we do a placebo test on our instrumental variable analysis by using as an instrument a variable that is not expected to be correlated with the Democracy variable. This is the share of nonreligious adherents. As column (5) indicates, this instrument is no longer significant at the first stage regression. However, the rest of the instruments are statistically significant and at the second stage the negative relationship between democracy and current account balance remains significant.

Our finding from the instrumental variable analysis is that the main results of our empirical section remain valid: there is a clear negative and statistically significant negative relationship between *Democracy* and the current account balance. Last but not least, the validity of our instruments is strong as the latter are not rejected from our formal tests.[16]

2.6 Conclusions

In the present chapter we examined the effect of democracy on current account balance. Our findings suggest that democracies tend to run higher current account deficits than autocracies. These results were found to be robust across alternative specifications. This negative relationship was justified on theoretical grounds. First, autocratic regimes want to be protected against political pressures of foreigners who

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[16] The Kleibergen-Paap Wald test suggests that all our instruments are strong and also F test indicates that our IV model is not weakly identified.

hold net foreign assets in their country. Second, as globalization is associated positively with democracy and current account deficits, dictatorships, which have lower exposure to the international economic environment, run lower deficits. Moreover, current account consolidations are more easily achieved in an autocratic environment, since dictators face lower political pressures in imposing austerity measures. Finally, as wages are higher in democracies in relation to autocracies, imports are also higher, thus, leading to higher current account deficits.

Our analysis points to the severe policy constraints embodied in current account adjustment programs. Since democracies tend to have lower current account balances, there are two important conclusions to be drawn. Firstly, democratic countries are more prone than autocracies to face severe problems in servicing deficits in their external sector. And this always comes with a severe political cost. For example, Frankel (2005) and Borensztein and Panizza (2008), show that current account problems may have severe political repercussions, by leading to changes in the government and a growing political unrest. Then, this may point to endogenous problems faced by democracies, by following policies that by themselves undermine the whole political structure of the country. The second policy conclusion to be drawn is that current account adjustments in democracies may be more difficult to implement and, ultimately, to be sustained in the long run. Therefore, any current account adjustment program either designed by local governments or by international intergovernmental institutions, must always take into account the political framework within which the problem must be tackled with.

Chapter 3: State and Religion, a simple theoretical model

3.1 Introduction

In the present chapter we are both interested in the role of religious denominations as self-interested units, which try to raise revenues, and how this goal affects their interactions with the state. So, we try to combine the related literature (see for example Iannaccone 1998; Ferrero 2002; Ferrero 2008) and analyze the effects of the competition between church and state on the government performance.

More specifically, we build a simple model of state and church competition similar to Coşgel et al. (2018). This model helps us provide a theoretical underpinning of the relationship between the existence of a state religion and fiscal capacity. Specifically, we examine i) a case where a state religion exists, and ii) a case where church and state behave independently. We model church as a rent maximizer (like, for example, in Ferrero 2002), which tries to maximize the number of followers. Similarly, we assume that the state maximizes rents from taxation. Therefore, we compare fiscal capacity investment in these two cases. We find that state religion produces higher levels of fiscal capacity as the degree of secularization increases.

Then, we test the robustness of our main results by changing some of our initial assumption. First, we examine a case where the state competes with many religious denominations. Then, we examine a case where the state bribes the religious denomination so as to reduce the religious activities and thus the amount of religiosity of the population.

Overall, our findings suggest that state religion will lead to a lower level of investment in fiscal capacity the higher the degree of secularization becomes. Also, we

show that the higher the number of religious denominations the state competes with, the higher is the level of fiscal capacity. Finally, we also show that the level of investment in fiscal capacity is higher the higher the amount of the bribe, the state gives to church, is.

We provide two arguments regarding our results. First, when the degree of secularization is high, the state will not invest in fiscal capacity since people will not value highly the religious good and they will not substitute secular with religious activities, thus the state does not face a challenge of losing revenues. Second, in a state religion where state choses both the level of investment in fiscal capacity and the level of religious activities, religion will legitimize the acts of the state and an increase in tax revenues will be achieved more easily. Thus, state has a low incentive to invest in fiscal capacity since it can raise revenues through church. This is consistent with the legitimization argument. Overall, our findings suggest that the more intense the competition is, the higher the investment on fiscal capacity will also be.

3.2 Literature review

Laurence Iannaccone (1998) separates the economics of religion literature into three lines. In the first one, religion is viewed from a microeconomic perspective, where techniques are employed to explain patterns of religious behavior among individuals, groups, and cultures. The microeconomic approach views religion in terms of market, club goods models and product differentiation and also uses tools such as spatial models in order to explain the interaction of religious industries. The second line treats religion from a macroeconomic perspective analyzing the effects of religion on many aspects of economy. The third line is about theology and its application on economic policies. In this chapter, we are going to combine the literature concerning the first two approaches

as introduced by Iannaccone as well as build a simple theoretical model to examine the church and state relationships inside an economy.

3.2.1 Religion as Firm

Religion's role from a microeconomic scope, suggests that religious denominations act as typical secular firms employing strategies, such as barriers to entry, in order to keep their monopoly power.

Iannaccone (1991) argues that religions behave as firms, since people make rational choices about religious activities and the religious suppliers respond to these choices. The theory of rational choice suggests that from the demand side, individuals will decide which religious denomination fits them best, based on a cost-benefit analysis (the compare the benefit the consumption of the religious good provides them with to the cost of this activity). From the supply side, churches behave as clubs or firms in a competitive market, providing services to attract potential customers (Iyer 2016). Iannaccone (1994) argues that market forces affect churches in the same way that affect secular firms. Competition has a strong impact on the quality of the good produced by the religion than monopoly does. This argument goes in line with Adam Smith who, in the Wealth of Nations, claims that religious competition will make religious providers to give higher effort to increase the quality of their good and to attract more adherents. Smith suggests that in the monopoly case where church is financed by government, religious suppliers will become lazy and will not provide a good quality of religious services, which will lead to a decline in the religious participation.

Using a theoretical model of religious competition, Montgomery (2003), finds that a higher competition among religious denominations will lead to higher religious participation. He also shows that larger markets, in terms of population, face more competition than smaller ones do, and this happens, since in a big market a larger variety of religious denominations can be supported. For that reason, the quality of religious goods may be increased, as the majoritarian religion, in order to keep its market share will increase its effort.

From the past, religious denominations were seeking to maximize their revenues. Ekelund et al. (1996, 2008), discuss the role of the Roman Church as a firm and provide useful details regarding its strategies in order to keep its monopoly power. Their source of revenue was from tithes, land rents, donations, fees charged for judicial services and income derived from monastic production. Furthermore, Ekelund et. al (1996) argue that Medieval Church was a franchise monopoly, where franchisees were bishoprics and monasteries, with certain economics of scale facing the problems of enforcement and entry control.

There is also a part of the literature that has analyzed the role of religious markets as club goods markets. In these studies, it is believed that, as in every collective good, there is potential for free riding, lack of commitment and participation. Also, in order to distinguish more from less committed members, practices such as stigma or sacrifice are employed (Iannaccone 1992; Berman 2000; Chen and Hungerman (2014).

Iannaccone (1992), introduces religion as a typical club good with positive returns to crowding. He shows that religion market might suffer from free ride issues and that issues can be solved by costs, that will screen out the less religious adherents.

His analysis suggests that religious group member's utility may increase when prohibitions exist, because rational members will agree with practices such as stigma or sacrifice. Also, prohibition of alternative secular activities will reveal the more committed members from the less committed ones, and it will may increase the utility of religious group members. These practices can be viewed as a tax to secular substitutes making the cost of entry higher.

Berman (2000), tries to analyze the negative outcomes in labor market in terms of lower labor market participation of ultra-orthodox Jews in Israel. She argues that in contrast with the price theory, the most time-intensive radical religious movements occur as real wages increase. Using the club model theory, she argues that as real wages increase, the prohibitions the club makes against secular activities increase too. The religious members of this club will provide mutual insurance to each other, which is religious motivated. For these reasons, religious activities, relative to secular, will increase. Also, subsidies that religions provide will need greater sacrifice to participate in secular activities. This is consistent with the *yeshiva* attendance in Israel and the decline in the labor force.

In a similar line, Chen (2010) using a survey in Indonesia, finds that financial crisis positively affected religious participation. He measures religious participation as Islamic school attendance and study of the Quran. This happened as religious organizations provided social insurance to people suffered more from the crisis. He also argues that this religious attendance was not a result of more free time for leisure or a decrease in opportunity cost, but a response to economic distress.

In a different approach, Ekelund et al. (1996), using evidence from medieval church, argues that religious goods are private goods which are purchased in a market

context. Religion is a service industry with the primary service to be guidance to the faithful in order to reach eternal salvation. A major concern of this type of product is that consumers cannot elicit information for the product their purchase from any other source than church. For that reason, medieval church was a monopoly provider of a pure credence good and the medieval church relied on its reputation to assure the quality of the services.[17]

According to Iannaccone (1998), religion is the ultimate credence good, because of the potential risk religious adherents may have associated with religious participation. His argument is that an individual who participates in religious activities faces an opportunity cost, as he devotes time to religious activities. However, this investment in time may never recouped.

Using the theory of credence goods, Castro (2012), analyzes the damnation of Galileo from the Catholic church. Castro argues that religion is a credence good and individuals cannot experience its quality neither before, nor after consumption. As the religious product is salvation, religious suppliers rely on their reputation in order to convince individuals to consume this good. Galileo, with his radical finding about the heliocentric system threatened Church's reputation. The problems church had to deal with, were that from the one side the condemnation of Galileo could harm its reputation, as Galileo was not only widely respected, but his findings could be easily confirmed by each individual, and from the other side if the church did not condemn Galileo, it was like admiring that church teachings till then were not correct. The way that church handled the case of Galileo caused a big damaged to its reputation. For that

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[17] A credence good is a good which its quality cannot be easily determined before or after purchase. The assurance of this good's quality is the reputation of the seller (Darbi and Karni, 1973)

reason, in order to reclaim this reputation, church introduced scientific teams in order to go in line with science and not have to deal with such issues in the future.

As every secular firm, religious denominations employ strategies in order to keep their market power. Those strategies could be barriers to entry, price discrimination, product differentiation, generally strategies employed to industrial organization models.

Ferrero (2008) provides a theoretical argument why the Christianity in the Roman Empire became a monopoly and an established church in the 4th century. He argues that the fact that Paul perceived the coming of Jesus was a strategic move. By this move, Paul, presented the (product) differentiation of Christianity from other religions. Since gods were supernatural beings in all the other religious denominations, the Christianity introduced Jesus who was a link between the God and the people. The other innovation of this new religion was its supernatural side. This side included miracles, treats, and more important the promise of salvation via Jesus. Finally, and most importantly, the timing when Christianity appeared was crucial: as problems like inflation, high taxation, problems with trade and population decline existed, the introduction of this new religion was redemptive for the populace. Thus, Christianity won as it took the middle ground. They targeted the median citizen, the urban working class and the women. In case not only to become but also to remain a monopoly, the Christianity became strict as they did not want other people and more specific educated ones to have doubts about the existence of such supernaturalism.

Returning to Paul and his letter to the Galatians[18], Ferrero (2014) argues that his aim was to shut Judaism out of the game. He presents a theoretical framework

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[18] Paul is stating that he has been told by God to write to the people of Galatia on His account.

where there is an incumbent which is threatened by another exclusive. His model leads to a Stackelberg equilibrium with the only difference that there is no cash market demand, but the two groups go for fishing for members. Paul's letter then is equivalent to the incumbent's strategic pre-commitment mechanism of the theoretical model. He then concludes that via this letter barriers to entry were reduced in Christianity, as the letter established the fact that people should not espouse the Jewish law to become Christians. Similarly, according to Ekelund et al. (1996), Medieval Church responded to competitive entry of Protestantism by lowering price and by improving the quality of the product so as to return disaffected customers to its fold.

Indulgences was a major source of revenues for the Roman Church. According to Ekelund et al. (1996), indulgences were sold to sinners in order to cleanse their sins. Price discrimination in market of indulgences existed, as, in many instances, ceteris paribus a richer individual paid more to buy an indulgence relatively to a poor one. Also, in the 13th century, in their attempt to centralize revenue collection, the papacy expanded the sale of indulgences directly from the pontific. Papacy did this as it faced enforcement costs. Interestingly, not only the Roman Church provided indulgences to sinners, but also Orthodox Church did so. Axarloglou et al. (2012) examine the role of indulgences in the second half of the 17th century in the Orthodox Church. They argue that market of the orthodox indulgences was similar to a typical oligopoly market with tactics as war of prices, price discrimination and bundling to be practiced. As in the Catholic Church, there were barriers to entry in indulgence market, as only patriarchs could provide such letters inside their territory, except the patriarch of Jerusalem who could sell everywhere. Furthermore, as in Catholic Church, price discrimination was also practiced. Their estimation about the price of indulgences is that on average was equal to two ships or a five-day work as a guard. However, the

story of the church's role as a pro t maximizing firm could stand from the years of its establishment.

3.2.2 Competition between religious denominations

In the economics of religion literature and its microeconomic aspect, there are also studies using models of industrial organization to analyze competition among religious denominations and the strategies they employ.

Barros and Garoupa (2002) introduce a model of industrial organization in order to provide evidence regarding the way that the religious market works. In this model, there is a church which acts as a typical Stackelberg leader, and a potential entrant which is the follower, and is a non-church or a sect. The leader will choose the level of its religious strictness to maximize his objective function, taking into account the preferences of the population, the value of the religious good and the probability that the follower will enter into the market. Their findings suggest that potential entry, will push the leader to become more conservative, whereas the probability that adherents will choose the follower has an ambiguous effect. The leader could become more liberal or more conservative, and this depends on the population's preferences.

Similarly, constructing a spatial Hotelling model, Iyer et al. (2014) examine the way that religious denominations can differentiate their product in a context of a developing country, where levels of inequality are high, in terms of service provision (such as health care or education). They find that nonreligious service provision will lead religious denominations to locate to more extremes, in order to eliminate competition in service provision. They also show that when differentiation is higher, conflict is higher, thus, leading them to provide more non-religious services.

3.2.3 Church and State

There are many researchers analyzing the relationships between the church and the state. The main finding of this analysis is that there could be a trade-off between political leaders and religious denominations. The government will provide privileges to the state religion, and the religion will use its influence in order to legitimize the state.

From the past, in both Islam and Christianity rulers were very concerned about legitimization. Via legitimization, rulers were eligible to extract more from the population but more important, legitimization was a channel to discourage revolt and to enable access to property rights assignment (Mann 1986; Greif and Tadelis 2010).

Vaubel (2017) argues that a political leader can gain legitimacy by giving state funds to build religious monuments, religious schools, churches, and generally, making actions that will glorify his name. He argues that according to the public choice perspective, rulers are self-interested, and thus try to maximize their utility by increasing their wealth power and prestige. The benefit of the ruler from those practices, outweighs the cost of the practices per se. Religion affects this maximization in various dimensions. First, religious adherents, in order to respect their denomination's preaching, are forced to respect the ruler as a judge or in many instances as a God servant. It is well known that many state religions were theocracies. Such examples are the Roman Empire, where the autocrats were treated as representatives of God and the ancient Egypt pharaohs who acted as the intermediary between his people and the gods. Vaubel, also suggests that a state religion will exhort individuals to pay their tax obligations and threatens punishment to those who do not. Using a sample of 31 state religions he finds that only powerful rulers have introduced state religions.

Not only in Christian but also in Islamic countries, there were pressures to citizens to pay taxes. An example of this is the *zakat* which was a religious tax in the 7th century. This tax was mandatory and was paid to the Islamic state (Kuran 2003). Meddeb (2005), also argues that religion in Islam was a legitimize force helping established rulers to achieve popular support. He provides a case study of Baybars who used his figure of the caliph, in the same way as Fredrich II (1194-1250), obtained the title of king of Jerusalem to enhance his powers in Europe.

The case of Zulfjikar Ali Bhutto in Pakistan, who initially was a pro-reforms politician supporting democratic ideas and separation of church and state, is an example of the importance of legitimization to some leaders in order to take control of the population. When Zulfjikar Ali Bhutto's army was defeated in 1971 in the war against India, he changed ideology supporting a religious movement and a merge between Islam and state. He did this because he wanted to gain legitimacy of the military. In 1978, he became president of Pakistan, and announced the enforcement of religious laws, introduced the Islamic tax and created Islamic banks (Nomani and Rahnema 1994).

Hourani (2005), gives the explanation why a secular regime in Islam may change and support a religious movement. The philosophy of Islam allows clerics to decide whether a ruler is a good Muslim and deserves to rule. For that reason, rulers in order to bestow legitimacy and defeat possible threats (political opponents) prefer to go in line with religion, although their initial ideology was secular.

3.2.4   Determinants of a state religion

The issue of legitimization is very important, because it allows us to explain the incentives of governments to support a state-run religion. Therefore, besides the

legitimization argument, there are also studies that examine the determinants of a state religion both in empirical and theoretical frameworks.

Using a theoretical model in which: a) state provides both the public and the religious good, b) state provides only the public good, Cosgel and Miceli (2009) try to examine under which circumstances the state will chose to adopt a state religion and provide both public and religious good. The find that the choice between a state-run and an independent religion depend only on a factor λ which re-affects the attitude of religion towards the state. They find that when the church favors the state ($\lambda > 0$), then church is not independent from state and the opposite happens when $\lambda < 0$.

Barro and McCleary (2005), using data from Barrett et al. (2001) over the period 1971-2000 and for 189 countries, try to find the factors that determine the establishment of a state religion in 1970 and 2000. Their findings suggest that the determinants of the existence of a state religion in 1970 and 2000 are: existence of a state religion in the past, the stability of the political regime in the 20th century, and the level of concentration of the religious market. Moreover, regional characteristics are equally important: a state religion will be less likely to occur in a communist country and in sub-Saharan Africa. Fox (2006) finds that more concentrated religious markets led to higher levels of government involvement with religion.

3.2.5 Religion and economic outcomes

The above studies give us the intuition about the way that religion can cooperate with state in order to have a mutual beneficial relationship. Religion provides legitimacy to the political leaders, while state finances the religious good from tax revenues. However, in the last part of this section, we will present studies, in which the effects of many aspects of religion on various economic outcomes are

analyzed. We believe that this is very important, as, these studies examine the effect of religion on a macroeconomic perspective, which is the whole economy.

A significant part of the literature has analyzed the effects of religion on individual's behaviors. A religious denomination will push its members to adhere to specific norms. In a more general framework, Guiso et al. (2003) using data from World Values Survey, over the period 1981-1997, find that more religious people are more trusting, trust each other and the government, and believe that markets are fair, relative to less religious. Also, they find that religious beliefs have a positive effect on economic attitudes related to economic progress. In an experimental framework, Norenzayan and Shariff (2008), examine the effect of religion on social behavior. Their findings suggest that when the religious beliefs are included in the experiment, this increases the trust and altruism towards strangers. They suggest that this happens due to supernatural monitoring. The effect of religion on individual's attitudes has to do more closely on the effect of religion on the whole economy. The way that people are making choices is very closely related to the economic performance at a macroeconomic level.

Examining the effects of a state religion on the institutional quality, Fox and Sandler (2005) empirically deal with the church and state separation comparing middle east and Western democracies and the effect of this separation on the regime type. They also examine whether the predictions of philosophers like Voltaire and Nietzche that religious influence on public life will decline in modern times have come true. Their findings suggest that liberal democracy can be compatible with religion and claim that the predictions of the philosophers were premature.

Kalyvas (2000), argues that religious groups can support democratic movements when they had strategic interests to do that. He analyzes a case where n secular incumbent exists, and a religious challenger wants to enter the game. Presenting two case studies one of Algeria and one of Belgium, he argues that religion can be compatible with democracy under specific circumstances. These circumstances depend on the attitudes of the incumbents toward the challengers. The challenger has incentive to support democracy in order to win in the elections. However, he must signal his intentions in an efficient way so as the incumbent to trust him. Conflict between the two parties may occur and this will result to a threat to democracy when the incumbent fights the challenger in order not to lose power or because of his fear that the challenger will not keep his promise.

According to Grigoriadis (2016), it is the type of religion which affects positively or negatively democracy. He claims that religion is closely related to the regime type of a country. He claims that religions norms connect the government with the religious denominations, as they de ne the demand for public goods. He introduces two types of religion: a collective one (e.g., Israeli kibbutz, Protestantism) and an individualist one (e.g., East Orthodox Church). Whether a religion is collective, or individualist depends on the presence or the absence of market incentives in joining, exiting and surviving within the boundaries of the religious collective. He concludes that in a country with a collective religion democracy is less likely to occur because in these countries the cost of dictatorship is lower.

Many findings however and that the relationship between state religions and institutions is negative. Secularization will probably lead to better economic performance. For example, La Porta et al. (1999) empirically find that religious

interventionism which comes from hierarchical religious structures may have a negative effect on governance.

Also, Tusalem (2015) argues that secularization affects bureaucratic quality, state accountability and democratic performance. He states that secular states perform better because of the absence of clerical involvement in politics. This happens as neutral policies towards religion are more likely to re effect meritocracy.

Lewis (2003), argues that the separation between church and state that never happened in Islam was the main reason of the bad economic performance of the Islamic countries. He argues that is not religion per se the obstacle to development, rather the kind of religion. Comparing Islam with Christianity, he claims that separation between church and state has never occurred in Islamic countries, as prophet Muhammad merged religion with politics, leaving no margin for any secular activities. For that reason, the quality of institutions was very weak relative to Western countries. From the other way, Christians had more distinct roles towards state and church and did not perform so close association between religious and secular things.

In a similar line, Greif (2006), examines the hamper of development in Islamic countries and claims that Islam and its institutional complexity system was the reason why development in East countries did not happen. He compares Christian to Islamic countries and argues that the former had a unified code of law, an effective legal system that inherited from the Roman empire and they also enforced other secular laws which allowed them to develop institutions which lead to economic development. From the other hand, Islam acted in a more different way, since Muhammad established both a religion and a political unit. The adherents of Islam had the

obligation to follow the Islamic code of law, Sharia. This regulation to economic and social life, caused more harm than good.

The above findings are consistent with Kuran (2004) who claims that the social mechanisms and the legal institutions under Islam were responsible for the slowdown of Middle East economic development. He argues that although the Middle East developed financial institutions two centuries earlier than Westerns did, by the 18th century, West Europe was far more developed. He also states that the law of inheritance under Islam, hindered capital accumulation and that traditional Islamic law caused low human capital and inhibited the development of the private sector.

Rubin (2017), tries to explain the differences of the levels of development between Islamic and Christian countries via the channel of institutions. Constructing a theoretical model, he finds that the level of development depends on the initial level of dependence between church and state. He argues that when the initial level is small, political authorities relax regulations on productivity-enhancing actions providing greater incentive for religious authorities to reinterpret eternal doctrine-even though such reinterpretation endogenously diminishes their ability to bestow legitimacy.

Fox (2006), argues that restrictions and regulations to minority religions is a sign of the dominant religion's influence on state. He also states that governments fear the power of religion and thus regulate it. Finally, Montalvo and Reynal-Querol (2003), find a negative effect of religious polarization on economic growth. Their argument is based on the effect of ethnic polarization on investment and to the probability of an internal war.[19]

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[19] Alesina et al. (2003) are the first to examine this negative association. Also, Papyrakis and Mo (2014) contribute to this literature by finding that corruption is a transmission mechanism between the negative effect of ethnic fragmentation and economic growth.

From the above discussion, it is obvious that many studies try to analyze the church-state relationship and the effect of religiosity in general to various economic outcomes. In this chapter, we try to combine all this literature and examine the effect of church and state interactions on fiscal capacity. We build a simple model of industrial organization in which we assume that church and state act as firms which engage in competition, when we assume a secular environment, or act as a monopoly in the case of a state religion. Our findings suggest that state religion most of the times lead to a lower level of fiscal capacity.

3.3   Theoretical Model

In this section we provide a simple theoretical model, which links the existence of state religion with fiscal capacity. We assume that there is a continuum of agents in $[0, \beta]$ range. Each individual is endowed with one unit of available time and optimally chooses whether to engage in secular or religious activities. Secular individuals earn a wage rate, w. On the other hand, religious individuals derive utility from participating in church activities.

The church, on the other hand, maximizes rents derived from religious participation, by choosing the level of spiritual activities which increases the utility gain of being religious, α. The state has an initial fiscal capacity level, which allows a tax rate up to t_0 to be imposed on a secular individual's income. Since we assume that the state maximizes revenues, it will choose to exhaust all its fiscal capacity when setting the tax rate t.

We examine two distinct cases: (i) a monopoly-type state religion, where a single state-church entity maximizes joined rents, and (ii) the state and church choose

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their strategy separately in order to maximize their rents. This distinction allows us to examine the effect of legitimization: in the case where a state religion exists, religion legitimizes the acts of the state and the latter can more easily raise revenues through its control over the church (e.g., Vaubel 2018). On the other hand, when the church and the state do compete, state will have to find other ways to raise revenues by investing in fiscal capacity.

3.3.1 Individuals

Each individual makes a binary choice as to whether to use his time endowment in secular activities, i.e., work for a wage, w, or in religious activities. This binary choice can be illustrated by a utility function of the following form:

$$U_i = \delta[w(1 - (t_0 + t))l + V(g)] + (1 - \delta)[\alpha e_i + V(g)] \qquad (1)$$

where $\delta \in \{0,1\}$ is a choice variable and takes value 1 when the individual is nonreligious and zero otherwise[20]. A higher e_i implies higher utility gain from religious activities. Hence, the overall utility of a religious individual is determined by an idiosyncratic parameter, e_i, and the spiritual activities of the church α. An individual with a higher preference e_i, for the religious activities will also be more susceptible, for example, to the preaching of the church. Finally, $V(g)$ is the utility that individuals derive from the public good.

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20 Our model then assumes that "No man can serve two masters: for either he will hate the one and love the other; or else he will hold to the one and despise the other. You cannot serve God and mammon." (Matthew, 6:24, King James Version 2006). Thus, even though individuals do not choose the amount of time to devote to secular and spiritual activities, at the aggregate level there is a secular/religious activity trade-off. This is a simplifying assumption. Alternatively, we could derive the same results had we assumed that we have homogeneous individuals who choose how much time to allocate to the two activities. With the latter interpretation, it is clear that time allocated to religious activities is untaxed, exactly as we have assumed in the above equation. Seror (2018), employs a similar assumption by arguing that clerics have an incentive to prohibit economic activities, in order to exert their control over the popular masses and consolidate their norms and thus acquire higher rents.

Welfare-maximizing individuals will then maximize utility by choosing either δ=1 or δ=0. This is equivalent to comparing the two terms in (1). Then, an individual i will choose to be religious when:

$$e_i > w\frac{1 - t_0 - t}{a}$$

Consequently, we may define the individual that is indifferent between working and supporting the church as the one with:

$$\hat{e} = w\frac{1 - t_0 - t}{a} \tag{2}$$

According to the uniform distribution $e \sim U(0, \beta)$, the share of the working population is then $\frac{\hat{e}}{\beta}$, while $1 - \frac{\hat{e}}{\beta}$ corresponds to the share of the religious adherents. Equation (2), thus implies that the share of working individuals is a negative function of fiscal capacity. As $1 - t_0$ increases, individuals substitute work with participation in religious activities. Similarly, an increase in a , which corresponds to more religious activities on behalf of the church, will increase the share of religious individuals.

3.3.2   Church

We model church as a rent-maximizing agent who produces a religious good with a linear cost on the number of adherents and the production function. This is consistent with the literature which finds that religious denominations act as secular firms in order to maximize their revenues (Iannaccone 1991; Ferrero 2008 etc.). Church's rents are described by:

$$R^c = 1 - \frac{\hat{e}}{\beta} - ca = 1 - w\frac{1 - t_0 - t}{a\beta} - ca \tag{3}$$

In our setting an increase in α affects the rents of the church by increasing the number of adherents, at a linear unit cost c.

3.3.3 State

We assume a revenue-maximizing state, which collects taxes in order to finance the production of a fixed amount of public good g with a unit cost. At the same time, the state has the option to incur a costly investment in fiscal capacity t, at a linear cost f per unit of fiscal capacity. Then, the rents of the state are given by

$$R^s = w(t_0 + t)\frac{\hat{e}}{\beta} - ft - g \tag{4}$$

When there is a state-run church, the state maximizes the joint church-state rents (equations (3) and (4)), by choosing α, t. In contrast, when there is an independent church, each of the two agents maximizes its rents separately. We examine each case in turn.

3.3.3.1 *State Religion*

We assume that a state-church monopoly maximizes total rents:

$$R^s_{srel} = \gamma w^2 (t_0 + t)\frac{1 - t_0 + t}{\beta} + (1 - \gamma)\left(1 - w\frac{1 - t_0 - t}{\beta a}\right) - ca$$
$$- ft - g \tag{5}$$

Parameter γ is a weight parameter that is given to tax revenues, while church's revenues receive $(1 - \gamma)$ weight. Now, state will also choose the amount of religious activities (a). We can argue that parameter γ denotes the degree of religiosity inside an economy. The lower this parameter is, the higher the weight individuals give to church's revenues which implies that the society is more religious. The joint maximization of (5) results in the optimal level of the two variables when there is a state religion denoted as a_{srel} and t_{srel}:

$$\alpha_{srel} = \frac{w(1-\gamma-\gamma w)\sqrt{\beta(f^2\beta - 4c\gamma w)}}{\beta(f^2\beta - 4c\gamma w^2)} \qquad (6)$$

$$t_{srel} = \frac{1}{2\gamma w(4c\gamma w^2 - f^2\beta)}\big((-4c\gamma w^2(-1+\gamma+\gamma w(-1+2t_0)))$$
$$+ f^2(-1+\gamma+\gamma w(-1+2t_0))\beta \qquad (7)$$
$$+ \sqrt{f^2(1-\gamma+\gamma w)^2\beta(f^2\beta - 4c\gamma w^2)}$$

From equations (6) and (7), we can deduce that:

$$\frac{dt_{srel}}{dw} = \frac{\beta(f^2(\gamma-1)\beta(-f\beta+\sqrt{\beta(f^2\beta - 4c\gamma w)}) + 4c\gamma w^2(f(-2+\gamma(2+w))\beta + (1-\gamma)\sqrt{\beta(f^2\beta - 4c\gamma w)})}{2\gamma w^2(\beta(f^2\beta - 4c\gamma w^2))^{\frac{3}{2}}} < 0 \ [21]$$

$$\frac{dt_{srel}}{df} = \frac{2cw(1-\gamma-\gamma w)\beta^2}{(\beta(f^2\beta - 4c\gamma w^2))^{\frac{3}{2}}} > 0,$$

$$\frac{dt_{srel}}{dc} = -\frac{fw(1-\gamma-\gamma w)\beta^2}{(\beta(f^2\beta - 4c\gamma w^2))^{\frac{3}{2}}} < 0$$

The effect of the cost of investing in fiscal capacity (f), on the investment in fiscal capacity is positive, while the effect of the cost of investing in a_{srel} (c) and the effect of wage w, on fiscal capacity are negative. The opposite happens or the effects of f and c on a_{srel}. Higher f, leads to lower a_{srel} while higher c leads to higher a_{srel}.

To explain the above signs, we have to consider the way that the state deals with tax as well as with church's revenues. In a state religion, since the state also choses the religious good it has the advantage to control church. A higher wage will attract more

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[21] The above relationship is always negative for conditions to be satisfied $\left(g < \frac{1}{1+2w}\right)$.

individuals to work and thus tax revenues will increase as the taxable income will increase too. And since tax revenues increase, state will make a lower investment in fiscal capacity t_{srel}, because in this case there will be no need to invest in (costly) fiscal capacity to raise revenues as this will occur indirectly with the increase in wage. Regarding the cost of investing in fiscal capacity, when the state faces a high cost (f), they will choose to reduce the power of church by choosing a lower a_{srel}. Since a higher cost of investing in fiscal capacity will directly negatively affect the decision to invest, state will also choose a lower level of a_{srel} in order to reduce the power of the church. This lower a_{srel}, will therefore have a positive impact on fiscal capacity, and thus t_{srel} will increase. In other words, f has a direct negative impact on the investment in fiscal capacity and also an indirect positive impact on fiscal capacity via a_{srel}. Our findings suggest that the overall effect of f on t_{srel} will be positive and this will come from the indirect effect of f on t_{srel}.

Similarly, this happens for the effect of c on a_{srel}. A higher c will lead state to reduce t_{srel} and this lower t_{srel} will have a positive impact on a_{srel}.

In the next subsection we examine the case of an independent church which choses the level of religious activities in order to maximize its rents.

3.3.3.2 Independent Church

In this case, we assume that the church and the state act independently and simultaneously. Maximizing (3) and (4) with respect to α and t, yields:

$$a_{comp} = \left[w \frac{1 - t_0 - t_{comp}}{\beta c} \right]^{\frac{1}{2}} \tag{8}$$

where,
$$t_{comp} = \frac{3cn(2 - 3t_0)w^3 - 2f(f\beta + \sqrt{\beta(3cw^3 + f^2\beta)}}{9cnw^3} \qquad (9)$$

Equation (8), indicates that a_{comp} is a decreasing function in t_{comp} which is the level of fiscal capacity invested, and also decreasing function in c which is the linear cost the church faces for each unit they invest in a_{comp}. This means that as fiscal capacity increases, church will become less aggressive and this will happen because a more powerful state will leave less space to church to gain followers. Also, a higher cost of producing a, will make church to choose a lower level of a.

From equation (9) we can deduce that:

$$\frac{dt_{comp}}{dw} = \frac{f\beta(3cnw^3 + 2f(f\beta + \sqrt{\beta(3cw^3 + f^2\beta)})}{3cnw^4\sqrt{\beta(3cw^3 + f^2\beta)}} > 0$$

$$\frac{dt_{comp}}{df} = -\frac{2\beta(3cnw^3 + 2f(f\beta + \sqrt{\beta(3cw^3 + f^2\beta)})}{9cnw^3\sqrt{\beta(3cw^3 + f^2\beta)}} < 0$$

$$\frac{dt_{comp}}{dc} = \frac{f\beta(3cnw^3 + 2f(f\beta + \sqrt{\beta(3cw^3 + f^2\beta)})}{9c^2nw^3\sqrt{\beta(3cw^3 + f^2\beta)}} > 0$$

The effect of wage on fiscal capacity is positive, implying that as wage increases, more people will choose to work and thus, state will have a greater incentive to invest in fiscal capacity, as the potential benefit will be higher.

Second, the effect of the cost of investing in fiscal capacity f is negative, which is reasonable, because a higher cost lessens the incentive of the investment. Last but not least, the effect of the cost of the church to invest in a_{comp} on fiscal capacity is positive. This effect implies that a higher cost of investing in a_{comp} will make church less aggressive and this will give the state an incentive to invest in fiscal capacity without facing competition and raise more revenues.

3.3.4   Comparison of state religion and competition

To determine whether state religion or competition, among church and state, result in higher fiscal capacity we compare equations (9) and (7). Thus, investment in fiscal capacity is lower under state religion as long as:

$$
t_{comp} - t_{srel}
$$

$$
= \frac{1}{2\gamma w(4c\gamma w^2 - f^2\beta) + \dfrac{(6-9t_0)w^3 - 2f(cf\beta + \sqrt{c\beta(3w^3 + cf^2\beta)})}{9w^3}} \Bigg(4c\gamma w^2(-1+\gamma \quad (10)
$$

$$
+ \gamma(2t_0 - 1)wf\big(f(1 + \gamma(-1 + w - 2t_0 w)\beta + (-1 + \gamma + \gamma w)\sqrt{\beta(f^2\beta - 4c\gamma w^2)}\big) \Bigg) > 0
$$

Depending on the underlying parameter values, (10) can be positive or negative. Our main findings can be summarized by the following figure[22], which plots the optimal investment in fiscal capacity in both cases.
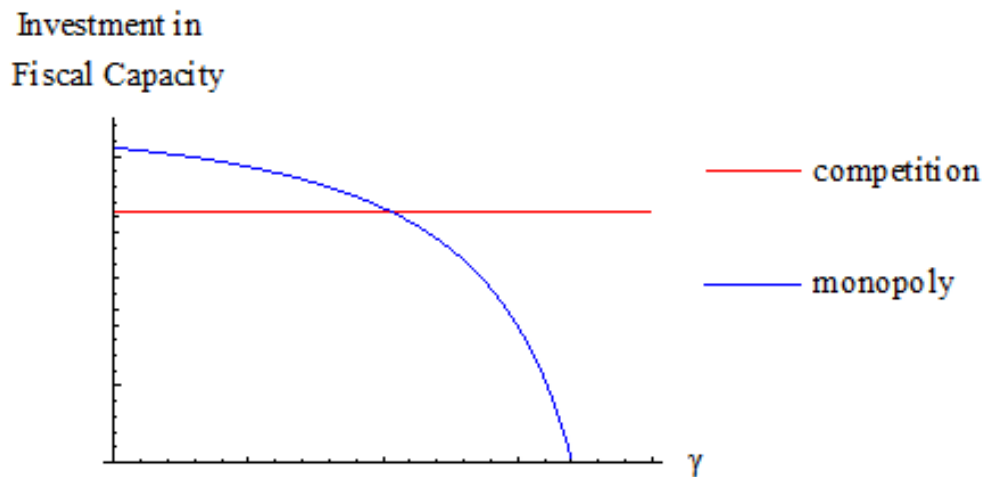
Figure 3.1: Comparison of state religion and competition

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[22] To draw the above figure, we have used $w = 2.1$, $f = 1.3$, $c = 0.9$, $\beta = 1.9$, $t_0 = 0$ as the underlying parameter values. The qualitative nature of our results however does not rely on the choice of these values. As we will show next, for all values that the second order conditions are satisfied, the figure is the same, and only the relative position of the curves change.

The red line corresponds to the fiscal capacity investment, in the competitive case, i.e., equation (9). As it does not depend on γ it is a straight line, parallel to the horizontal axis. The blue line corresponds to the fiscal capacity investment in the state-religion case, i.e., equation (7). Investment in fiscal capacity, in the state-religion case becomes zero at a level of γ. For the values presented here this occurs at $\gamma = 0.18$. For values of γ above this value, investment in fiscal capacity is zero in the state-religion case.

Figure 3.1, suggests that as γ increases the investment in fiscal capacity in the monopoly case falls. Lower values of γ, which imply a higher degree of religiosity, produce higher levels of fiscal capacity and as the degree of religiosity decreases investment in fiscal capacity also decreases. This result depends on two forces. First, in a state religion with a high degree of religiosity (low γ), state will invest in fiscal capacity in order to satisfy the faithful and provide a higher level of religious services. Since the degree of religiosity falls, state has no incentive to invest in fiscal capacity since individuals are less religious and thus will not chose to substitute secular with religious activities. Second, this result is affected by the legitimization effect. In a state religion case, state can increase tax revenues with the assistance of the religious denomination. Hence, state does not need to make a costly investment in fiscal capacity since it can achieve higher tax revenues through church. In contrast, there is always an incentive to invest in fiscal capacity in the competitive case. When church and state act independently, state has no other way to increase tax revenues and choses to invest in fiscal capacity. Thus, what the figure overall reveals, is that as long as the state is a not secular one, i.e., γ is not close to zero, state religion is associated with lower investment in fiscal capacity. Hence, as investment in fiscal capacity is costly, the monopoly state has an incentive to invest in α, instead of t. Given that creating fiscal institutions is

more costly than increasing religious activities, the monopoly state-religion chooses a higher α and lower t.

In Figure 3.2, we provide some comparative statics. The dotted lines represent the changes in the underlying results in the state religion and competitive case, when there is a decrease in f, an increase in w, or an increase in c. As the reader can verify, all these changes result in to higher (resp. lower) fiscal capacity in the competitive (resp. state-religion) case. Hence, the comparison among the two cases, given the above changes in the parameter values, makes investment in fiscal capacity higher in the competitive case.

These results can give us interesting insights for the underlying relationship. Countries with a higher level of economic development, i.e. higher w, would have benefited more from a church and state separation. A similar result holds for countries with low f. In our setting we can conceive that these are countries where the population is more religious, as the church can expand its activities with a relatively low cost.
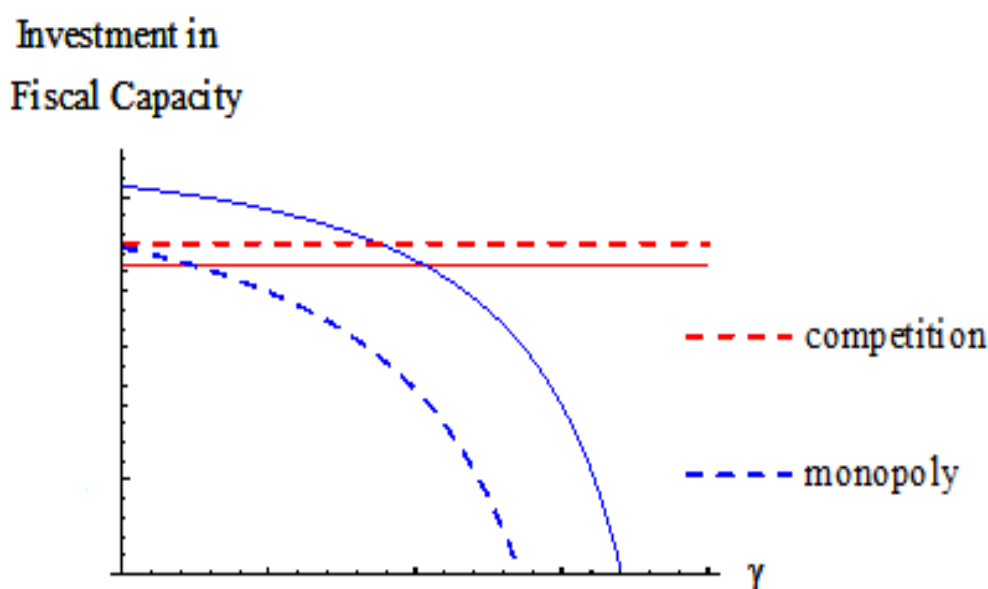
Figure 3.2: Comparative Statics

3.3.5 Robustness

In this section we examine two additional cases. In both cases, church and state compete but with some differences. First, we examine a case in which state competes for members with n rather than one church and we will also examine a case in which state gives a bribe k to church in order the latter to invest in a lower a. We will compare both cases with both presented in the previous section.

3.3.5.1 N religious denominations

In this first case, we assume that state competes with n religious denominations rather than one. The framework is similar to the case of one religion and each church's rents are given by:

$$R^{nc} = 1 - \frac{\hat{e}}{\beta} - ca_i \quad i = 1, \dots, N$$

We assume that the religious denominations compete for followers such as total a_{nc} to be:

$$\alpha_{nc} = \frac{\sum_{i=1}^{n} a_i^2}{\sum_{i=1}^{n} a_i}$$

and if we maximize with respect to a_i and impose symmetry, this yields to the total amount invested in a which in this case is:

$$a_{nc} = \left(w \frac{1 - t_0 - t_{nc}}{n\beta c} \right)^{\frac{1}{2}} \tag{11}$$

Equation (11) differs from (5) as the former is also a decreasing function in n. This means that as the number of religious denominations increases, the total amount invested in a_{nc} decreases. This result suggests that competition lessens the incentives of religious denominations to invest in a_{nc}. As competition among religious denominations increases, rents are shared to more denominations and thus, the marginal incentive to increase rents are lower. This happens as parameter n acts as an additional cost of investing in a_{nc}. Since a_{nc} will be lower, t_{nc} in the competitive case will increase, thus the number of people that choose to work instead of supporting church. The solution for a_{nc} is greater as n increases, as $da/dt < 0$.

3.3.5.2   A Bribe to Church

In this subsection we provide a case where the state and state compete and the state gives a bribe to church, in order the latter to invest in a lower a. We model this bribe as $k(\tilde{a} - a\ )$, meaning that the government gives k amount of every unit of $\tilde{a}$ lower than a_{brb} to church. Therefore, church's rents now become:

$$R^c_{brb} = 1 - \frac{\hat{e}}{\beta} + k(\tilde{a} - a) - ca_{brb} = 1 - w\frac{1 - t_0 - t}{\beta a} + k(\tilde{a} - a) - ca \qquad (12)$$

while states rents are now given by:

$$R^s_{brb} = w(t_0 + t)\frac{\hat{e}}{\beta} - k(\tilde{a} - a) - f(\tilde{a} - a) - ft_{brb}$$

$$= w^2(t_0 + t)\frac{1 - t_0 - t}{\beta a} + k(\tilde{a} - a) - ft$$

(13)

and maximizing (13) with respect to a yields:

$$a_{brb} = w \frac{1 - t_0 - t^{\frac{1}{2}}}{\beta(c + k)} \tag{14}$$

From equation (14) we can conclude that a_{brb} is decreasing in k and this means that the higher amount it is given from state, the lower it invests in a_{brb}. A higher k implies that state gives church a higher amount to reduce investment in a_{brb}.

Also, maximizing (13) with respect to t, yields to the optimal level of investment in fiscal capacity in this case:

$$t_{brb} = -\frac{3w^2\big(k + (c + k)(-2 + 3t_o)\big) + 2f\big(f\beta + \sqrt{\beta(3w^2(k + (c + k)w) + f^2\beta}}{9(c + k)w^3}$$

In , we present the results from this special case, compared to our baseline results of Figure 3.1. The solid red lines refer to the case of the bribe.
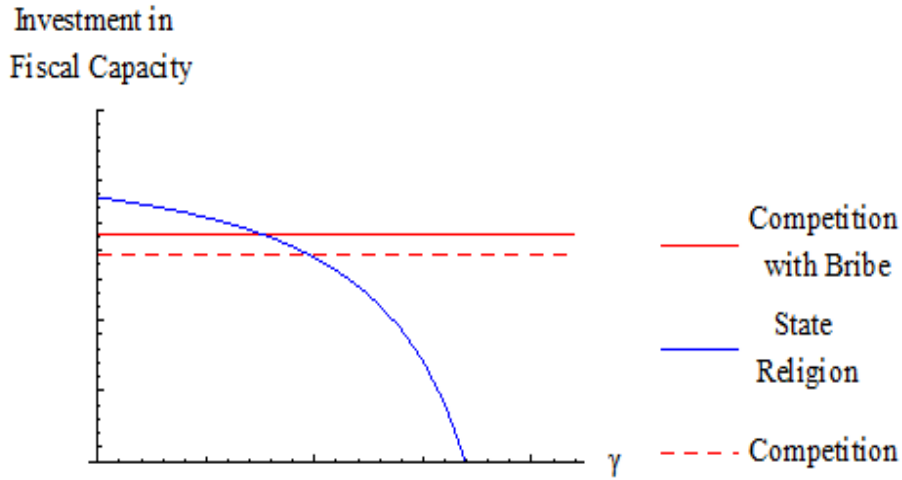
Figure 3.3:Competition and bribe
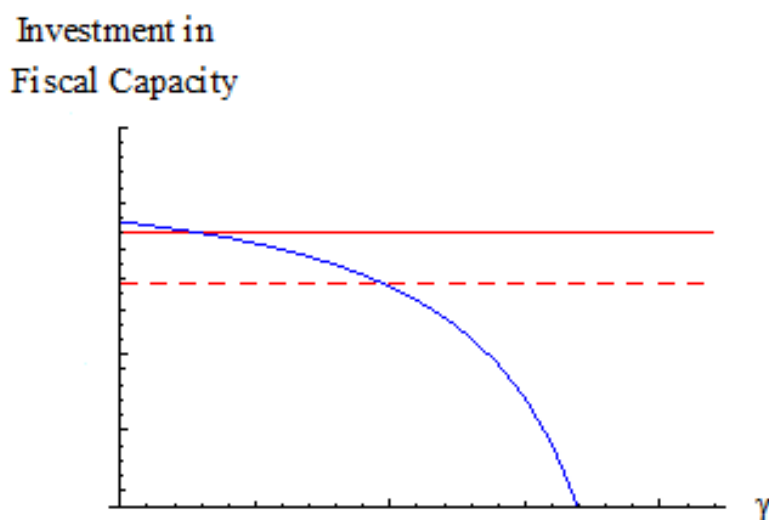
Figure 3.4: An increase in bribe

As da_{brb}/dk is lower, a higher k will reduce the amount of α and this will lead into a higher investment in fiscal capacity because church becomes less aggressive. Figure 3.4 shows that as k increases the competitive case gets closer to the monopoly case meaning that the higher the amount church is given in order to reduce its a_{brb}, the higher the level of the investment in fiscal capacity.

From the theoretical model presented above, the results suggest that state religion can both positively and negatively affect the investment in fiscal capacity. However, we argue that most of the times, state religion will result in a lower level of fiscal capacity. To our view, the degree of secularization is a crucial parameter that affects the investment in fiscal capacity in the state religion case. Up to a level of secularization, state religion will produce higher levels of fiscal capacity than the competition will do. As secularization increases, state religion produces lower levels of fiscal capacity than the competitive case does. We assume that it is reasonable to believe that the degree of secularization will not be zero even if we are in the state religion case

and that most of the times individuals will give a higher weight to the tax revenues. Otherwise, in a case where the degree of secularization is zero, the case will not be state religion but theocracy. However, in order to be sure that our argument is correct, we have to deal with this relationship empirically. We need to examine whether countries with an official state religion will have a lower level of fiscal capacity relative to those not having a state religion which refers to our baseline model. For that reason, in the next chapter we are going to examine the following testable hypothesis:

Testable Hypothesis 1: Having an official state religion leads to a lower level of fiscal capacity.

3.4 Conclusions

This chapter built a simple theoretical model in order to examine the church-state relationships on the decision to invest in fiscal capacity. We modeled both church and state as rent maximizers. In the case of a state-run religion, state acts as a monopolist which decides for both church and state. In the competitive case, the two agents act independently making costly investments in order to attract followers.

We argue that a state religion that it is more secular, is less likely to invest in fiscal capacity than in the case when state competes with church. Furthermore, we also argue than as the number of churches, that the state competes with, increases, the investment in fiscal capacity increases. Furthermore, we extend our model introducing a specification in which state bribes church in order the latter to be less competitive and find that in this case the investment in fiscal capacity is greater than in the case where no bribe exists.

Chapter 4: State religion and fiscal capacity

4.1 Introduction

The role of religion on economic performance has been considered to be crucial since as early as 1905, according to the work of Weber (e.g., Landes 1999; Weber 2013). The issue of the church-state relationship, on the other hand, has received less attention in the economic literature. Yet, the state and the church are "two of the most powerful and longest lasting of human institutions" (Monsma and Soper 2008, p. 1). In many instances in the past, state leaders acted as representatives of God in order to gain support from their citizenry (see for example the Roman emperors or the Pharaohs in ancient Egypt). Thus, one should expect that the state-church relationship will affect the development of economic institutions. Here, our focus is on the ability of the state to raise revenue, which is typically called fiscal capacity (Besley and Persson 2011).

The literature, when examining the effect of state religion on revenues, has so far developed the so-called legitimization argument. According to this view, rulers are able to extract more revenues from the population when a state religion exists, as the church legitimizes the acts of the state (Auriol and Platteau 2017; Greif and Tadelis 2010; Vaubel 2017; Coşgel et al. 2018). As religious leaders have a greater influence on the population, they are able to incentivize individuals to respect the ruler, pay their tax obligations, and threaten to punish those who do not.[23] Moreover, as a corollary to the above argument, when the state faces increasing needs for revenues, it will turn to the legitimizing force of the state-run church to increase compliance or even increase tax rates without spurring discontent. If this rationale was correct then countries with a

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[23] Following the logic of the legitimization effect, several authors have pointed out that a state-run religion discourages revolutions and allows a better assignment of property rights (Mann 1986; Greif 2006).

state religion would have less of an incentive to undertake other costly revenue-raising policies, such as investment in improving the fiscal system, i.e., they would invest less in fiscal capacity. Thus, according to this argument, in the long run, the legitimization effect would adversely affect fiscal institutions.

Our argument is motivated by several historical accounts. For example, in 1162 England, King Henry II appointed his friend Thomas Becket as Archbishop of Canterbury, in an attempt to gain control over the church and also consolidate the state's power. However, after Becket became archbishop, he did not behave according to Henry's wishes; instead, he came into conflict with Henry over ecclesiastical privileges and the church's rents, which Henry wanted to restrict. And even though the Becket controversy ended in 1170 with Becket being murdered by four King's knights, during the period of conflict with the church, Henry undertook a series of important fiscal and institutional reforms, which enhanced the state's revenue-raising ability (White 2000). While other events, like the war with France, may have affected the decision to invest in fiscal capacity,[24] one cannot rule out the effect of the conflict between the state and the church. If Henry had secured increased revenues through his control over the church, his incentives to invest in fiscal capacity would have been different.

The case of King Otto in Greece provides similar conclusions, but in a country with a state religion. To raise revenues, to repay early Greece's debt to France, King Otto proclaimed the autocephaly of the Greek Orthodox Church. This allowed him to declare all uninhibited monasteries as government property and, at the same time, tax all inhabited ones with a tax equal to 1/10 of their total production (Mamoukas 1859). Fiscal reforms, however, were not implemented. In other words, the existence of state

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[24] This is consistent with the standard view held in the literature (Besley and Persson 2013) that external conflicts have a strong positive impact on fiscal capacity.

religion gave Otto the opportunity to use control over the church and its rents directly, instead of investing in fiscal capacity.

The present chapter is related to a number of studies that examine the determinants of fiscal capacity (Thies 2004; Besley and Persson 2008, 2011; Cardenas 2010; Dincecco and Prado 2012). A common finding in this literature is that an external war increases fiscal capacity. As public defense is a public good that people value highly during wartime, the government follows the wishes of the citizenry and uses investment in fiscal capacity to finance it. In contrast, an internal war has the opposite effect. As the leader faces uncertainty over his tenure, he has no incentive to invest in fiscal capacity. Our argument, then, is related to the above studies as it considers the effect of a different type of competition, that of the church and the state. Our argument is also motivated by our findings of the theoretical model presented in the previous chapter.

As a first step, and motivated by the two historical examples above, we estimate the effect of having a state religion on fiscal capacity in a standard OLS model using data for 143 countries over the 2000–2015 period. The main dependent variables are the fiscal capacity measures, as computed in the relevant literature (e.g., Besley and Persson 2011). To determine the existence of state religion we use the data of Barrett et al. (2001).

Even though these findings support our main argument, i.e., having a state religion significantly reduces fiscal capacity, out of concern that endogeneity might bias our findings, we also employ our data in a potential outcome framework. Using an inverse probability weighting scheme, we examine the effect of having a state religion

in 2000, on the average 2000–2015 fiscal capacity. The findings from this latter model are qualitatively similar to the results of the OLS model.

Then, to examine our hypothesis in a historical context, we extend our data over the period from 1900 to 2010 by employing a dynamic inverse probability model as in Acemoglu et al. (2019).[25] Our findings suggest that if a state religion is established at time zero, this will have a negative effect on fiscal capacity 10–16 years later. This effect is estimated to be equivalent to a 1/3 standard deviation decrease in the fiscal capacity variables. Overall, all empirical models give support to the idea that there is an adverse effect on fiscal capacity from the existence of a state religion.

The rest of the chapter is structured as follows: In the following section, we present our data and empirical methodology. Section 3 provides the empirical results. Section 6 concludes.

4.2   Data and Empirical Methodology

Our main dependent variable is fiscal capacity, as defined in Besley and Persson (2011), i.e., the administrative infrastructure required to impose a certain tax on a certain tax base. To this end, we use the standard Besley and Persson (2011) measures of fiscal capacity, which are available for a large sample of countries and for an extended number of years. These measures are constructed under the assumption that countries with low levels of fiscal capacity tend to rely more on indirect taxes (see also Rodrik 1995; Adam 2009). In contrast, high fiscal capacity countries collect more

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[25] The historical data for fiscal capacity are taken from Mitchell (2007). To determine the existence of state religion, we build a novel variable, which is based on the work of Barrett et al. (2001). Since data from Barrett for the existence of state religion are only available for three years (i.e., 1900, 1970, and 2000) we extend this variable to a wider range of years, by examining the religious provisions in each state's constitution, as presented in the reports of the International Center for Law and Religious Studies (Martines and Durham 2015). On the downside, using a more extended time series dataset results in a drop of our cross-sectional sample to only 44 countries.

revenues by using the (less distortionary) direct taxes. The major advantage of these measures is that they can be computed both for more recent years and, hence, serve as our starting points and provide evidence of robustness of our main results, but they are also available for the 1900–2010 period, allowing us to examine the historical effect of abolishing state religion on fiscal capacity.

Following the above rationale, we use the data from the International Center for Tax and Development (ICTD/UNU-WIDER, 2018). This dataset meticulously combines data from several major international databases, as well as drawing on data compiled from all available International Monetary Fund (IMF) Article IV reports. To estimate long-run measures of fiscal capacity, which are not affected by short-run/annual variations in the revenue data, we compute the average of the variables for the period 2000–2015. Our main variables of interest are: i) total tax revenues as a share of GDP (*Total Taxes),* and ii) income tax revenues as a percentage of the GDP (*Taxes on Income*). We also employ iii) the ratio of income tax revenues to indirect tax revenues (*Income/Indirect*), iv) the one minus trade tax revenues (*Trade Taxes*) as a share of total tax revenues, and v) the one minus indirect tax revenues as a share of total tax revenues (*Indirect Taxes*).[26]

Our main variable of interest is a dummy variable for the existence of a state religion in 2000, as taken from the *de facto* classification of Barrett et al. (2001). This definition of state religion incorporates those cases where the state either identifies itself with a certain religion, or proclaims itself as religious, or recognizes or favors a church or an official religion or a national church or an established church (for the complete definition see Barrett 1982, p. 96). Following Barro and McCleary (2005), we classify

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[26] We use the one minus trade and indirect tax revenues so as to have a measure of fiscal capacity. In this way, higher values of these variables imply higher levels of fiscal capacity and vice versa.

a country as having a state religion only when Barrett et al. (2001) classify a country as religious and further associate it with a particular religion.

Of course, one might argue that on the basis of this rather broad definition we cannot decide whether the state and the church are integrated or not. However, any general categorization may be equally problematic, especially when different religions have distinct organizational structures. Hence, instead of implementing our own criteria, we use the criteria employed in existing qualitative studies. Furthermore, we examine the robustness of our results under alternative definitions of the main variable. Thus, in the robustness tests we have also employed a state religion dummy variable constructed by Fox (2019). Moreover, since state religion appears to be present in countries with a single dominant religion, we have constructed a dummy variable for a state religion which takes a value one when there is high religious concentration within the country.[27] Even though we acknowledge that both these definitions have similar drawbacks to our main measure, the fact that our results do not rely on the particular measure of state religion indicates that the underlying relationship does not depend on a particular definition of state religion.

The starting point of our econometric analysis is a simple OLS model, in the spirit of Besley and Persson (2008, 2011). The dependent variable is the level of fiscal capacity captured by the five proxies of fiscal capacity discussed above as an average for the period 2000–2015, while the main independent variable is a dummy variable for the existence of a state religion in 2000. To correctly specify our model we use the same control variables as in Besley and Persson (2008, 2011), which are summarized in Table.4-1. These are: i) the incidence of democracy (Democracy up to 1975), more

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[27] i.e., the Herfindahl index of all main religious groups is above 8,500.

democratic regimes are expected to have higher levels of investment in fiscal capacity (Besley and Persson 2007)), ii) the incidence of parliamentary democracy (Parliamentary democracy up to 1975), as in parliamentary democracies the existence of party competition within government leads to more government spending (Persson and Tabellini 2004), iii) the incidence of war (External Conflict up to 1975), since wars induce governments to find more revenues to finance them (Dincecco and Prado 2012b), iv) indicators of Legal Origins, since legal origins are correlated with the institutional environment of a country, hence they affect investments in tax systems (Besley and Persson 2008, 2011), and v) regional dummies to capture region-specific effects.

Table.4-1: Data sources and definitions

Variable	Mean	St. Dev	Min	Max	Source	Definition
One minus custom taxes	0.80	0.20	0	1	Mitchell (2007)	Custom taxes over total taxes for 1750-2015 period.
Direct taxes	0.28	0,18	0	0,99	Mitchell (2007)	Income or Direct or taxes on Land Income and property for 1750-2015 period.
Total taxes	17	7.61	0.80	44.55	International Center for Tax and Development	Total Taxes excluding social contributions as percent of GDP (average 2000-2015).
Taxes on income	6.38	4.47	0.02	28.33	International Center for Tax and Development	Income taxes as percent of GDP (average 2000-2015 period).
Income/Indirect	84.93	219.37	1.67	2850	International Center for Tax and Development	Ratio of income taxes to indirect taxes (own calculations average 2000-2015 period).
Trade taxes	83.21	17.68	12.19	100	International Center for Tax and Development	Trade Taxes as percent of Total Taxes (average 2000-2015 period).
Indirect taxes	39.7	17.25	1.69	96.77	International Center for Tax and Development	Indirect Taxes as percent of Total Taxes (average 2000-2015 period).
State religion	0.44	0.50	0	1	Barret et. al. (2001) and Own Calculations	Dummy taking value 1 when state religion exists (1750-2015).
State religion in 1970	0.39	0.49	0	1	Religion Adherence Data, Barro 2003	Dummy taking value 1 if state religion existed in 2000.
State religion in 2000	0.39	0.49	0	1	Religion Adherence Data, Barro 2003	Dummy taking value 1 if state religion existed in 1970.
External conflict up to 1975	0.30	0.75	0	0.61	Correlates of War	Years up to 1975 that a country engaged in a war.
Democracy up to 1975	0.32	0.44	0	1	Polity IV Project	Proportion of years of Democracy up to 1975.
parliamentary democracy up to 1975	0.27	0.44	0	1	Polity IV Project	Proportion of years of Parliamentary Democracy up to 1975.
GDP per capita	8.272	1.17	5.43	10.31	Maddison	Log GDP per capita.
Population	15.49	2.20	9.24	21	World Bank Development Indicators	Log Population.
Population squared	244.75	65.93	85.38	441.31	World Bank Development Indicators	Log Population squared.
Executive constraints	4.98	1.93	1	7	Polity IV Project	Extent of institutionalized constraints on the decision-making powers of chief executives.
Main/Secondary religion shares	0.5	0.32	0	0.986	Religion Adherence Data, Barro 2003	Share of adherents of main religion to those of secondary religion.
Communist in 1985	0.25	0.43	0	1	Religion Adherence Data, Barro 2003	Dummy if a country was communist in 1985.
Communist in 2000	0.025	0.16	0	1	Religion Adherence Data, Barro 2003	Dummy if a country was communist in 2000.

Even though the simple cross section OLS model can be very helpful to uncover the relationship between state religion and fiscal capacity, it fails to take into account an inherent selection problem: the simple legitimization argument suggests that countries with a low level of fiscal capacity will choose to have a state religion as a way of increasing their revenues. Therefore, it might be the case that the legitimization effect is present but has no effect on the fiscal capacity. Similarly, countries with high levels of GDP per capita experience greater levels of fiscal capacity and following the secularization argument (Iannaccone 1991) they may opt to have an independent church. In other words, having a state religion is not randomly determined.

To solve the selection into treatment problem, we use a potential outcomes framework. As a first step we use the determinants of the existence of state religion in 2000, as in Barro and McCleary (2005), to estimate the propensity to have a state religion. These determinants are the share of the adherents of the main religion to the adherents of the secondary religion (*main/secondary religious shares*),[28] (log of) population and (log of) population square,[29] GDP per capita,[30] two dummy variables, taking the value of 1 if the country was communist in 2000 and in 1985, respectively,[31] and an indicator for constraints on the chief executive variable (*Executive Constraints*).[32]

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[28] Countries where more adherents are concentrated to one denomination are more likely to have state religions

[29] As population increases, a state religion can survive more easily. However, after a threshold level of population further growth in population increases religion-adherence homogeneity, attracting more religious denominations and reducing the probability of having a state religion.

[30] We expect decreases in religious participation as GDP increases (Iannaccone 1991; Opfinger 2011). On the other hand, richer nations may spend more money on religious activities, thus creating an ambiguous effect.

[31] Communist countries are less likely to establish state religions (Anderson 1994)

[32] The difference with the cross section OLS model and the cross-section inverse probability model is that the latter, instead of modeling fiscal capacity, as the OLS does, it models the probability of having

Then, we employ an inverse probability weighting model, to create pseudo-randomization, where the treatment, i.e., the existence of a state religion, is independent of the measured confounders. This method estimates the average difference in fiscal capacity between countries with and without a state religion, by placing higher weights on the outcome of countries that are less likely to have a state religion. And if the selection of treatment is properly modeled, then we are able to estimate the causal effect of having a state religion on fiscal capacity.[33]

To find further evidence in favor of our main hypothesis, we next turn to historical data. Specifically, we extend our sample using the data of Mitchell (2007), which cover the 1900–2010 period and construct our two main variables as in the cross section model, (i) one minus the share of custom taxes to total taxes (*Custom Taxes),* and (ii) the share of direct taxes to total taxes (*Direct Taxes)* over the 1900–2010 period. We include all available data and our sample then contains a total of 44 countries.[34]

For the state religion variable, in our historical dataset, we also use the data of Barrett et al. (2001). Unfortunately, these data are only available for three specific years, i.e., 1900, 1970, and 2000. To determine the year in which there was a change in

a state religion. This is an important issue, as the literature on fiscal capacity has been rather inconclusive on the determinants of fiscal capacity.

[33] The inverse probability model has several advantages. First, as long as the selection to state religion is properly modeled, as in Barro and McCleary (2005), we do not need to have a proper model for fiscal capacity, which appears to be an issue of controversy among researchers. Second, we do not need to rely on the selection of a valid instrument, which by construction is difficult to find. For example, historical variables, might be inappropriate as fiscal capacity takes time to be created, and will thus affect fiscal capacity through other channels (besides state religion) as well. Similarly, variables that are related to religion are also correlated with cultural traits within the country, and thus affect fiscal capacity through other channels as well. In the absence of instruments, a potential outcomes model might be the only solution to estimate a causal effect. Third, the robustness of the inverse probability weighting model can be evaluated through the application of a double robust model, which uses both the results of the inverse probability weighting model and the standard regression model, and for consistent requires only one of these models to be correctly specified. Finally, in practical terms, it allows for a direct comparison with the panel data dynamic model used, we also apply in our analysis.

[34] The country sample for all cases is listed in the appendix.

the status of the country (if any) from state religion to a secular state (or vice versa), we use the reports of the International Center for Law and Religious Studies (Martines and Durham 2015). This allows us to determine whether during the period from 1900 to 2000 there was a change in the provisions in each country's constitution regarding the state-church relationships. Consequently, we are able to determine the exact year of the changes in the dummy variable provided by Barrett et al. (2001), when there was a change, or to determine if indeed there was no change in the associated country. For the 44 countries in our sample, there were 15 cases where state religion was disestablished and six cases where state religion was established.[35]

The final panel dataset can then be estimated with a semi-parametric inverse probability weighting method as in Angrist et al. (2018), Acemoglu et al. (2019), and Adam and Tsarsitalidou (2019). This method allows us to model the counterfactual scenario, i.e., the path of fiscal capacity when there is no change in the constitutional status of the church. Following this analysis, any deviation from the counterfactual scenario is attributed to the treatment, i.e., change in the state-church relationship.

This method fits to our setting for several reasons: First, it does not rely on the choice of variables to model the path of fiscal capacity, which is modeled by using only the lagged values of the dependent variable and time effects. Second, it examines the effect over time, allowing us to uncover the changes in the outcome variable, i.e., fiscal capacity, for a number of years after a "random" treatment. Furthermore, by estimating

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[35] Even though we are constrained by the unavailability of the data for fiscal capacity to only 44 countries, an additional advantage of using the inverse probability weighting model is that it is not affected by the low number of treatments, in contrast to other potential outcome models, such as the regression adjustment method or the propensity score matching.

changes in fiscal capacity, country fixed effects, which capture cultural, historical, and institutional aspects of fiscal capacity, are wiped out. Finally, the inverse probability weighting model does not require the number of treated units to be equal to the number of non-treated units. This is an important feature, as the number of treatments, i.e., countries that established and disestablished state religion, are six and 15, respectively. Therefore, we can estimate the Average Treatment Effect on the Treated (ATET) of state religion on fiscal capacity, for t=-5,-4,..25, with t=0 being the year when a state religion was established or disestablished.

Specifically, once we control for the time and country effects, lagged values of state religion and fiscal capacity dynamics, changes in *Fiscal Capacity* are random.[36] Then, any difference in the fiscal capacity between observations/country-year pairs that have experienced state religion and that have not experienced state religion can be attributed to the effect of state religion. Using a probit model, we first estimate the propensity to (dis)establish a state religion at *t* conditional of not having (having) a state religion in *t-1* using year effects and lags of *Fiscal Capacity* as control variables. Then, the effect of *State Religion* on the change in fiscal capacity is the weighted average of the changes in fiscal capacity, with weights given by the inverse of the propensity score, if the country establishes a state religion at time *t*, and minus the inverse of one minus the propensity score, if the country does not establish a state religion. In this manner, the effect of a state religion is a weighted average of the changes across observations. However, country-year pairs that, according to their pre-state religion dynamics, are expected to have a state religion, receive a lower weighting. In contrast, country-year

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[36] See also Angrist and Kuersteiner (2011) for the technical details.

pairs that do not experience adverse fiscal capacity dynamics prior to $t=0$ receive a higher weighting.[37]

The results of all three associated empirical methods are presented in the following section.

4.3   Results

As a first step, we estimate a simple cross-sectional OLS model. Each column in Table 4-2 corresponds to a different measure of fiscal capacity. The main variable of interest is the dummy variable for the existence of state religion.

Our findings suggest that the existence of a state religion has a negative effect on fiscal capacity. As we can see, the existence of a state religion reduces *Total Taxes* by 3.77 percent of GDP (about 1/2 of standard deviation). This result is statistically significant at the one percent level. Similarly, countries with a state religion have, on average, 1.25 percent lower *Income Taxes,* which is approximately 1/3 of standard deviation in the corresponding variable. The corresponding estimated coefficient is -18.23 percent and significant at the 10 percent level of statistical significance when we use as a dependent variable *Income/Indirect Taxes (1/10 of standard deviation).* On the other hand, we find that trade taxes are higher in countries with state religion, as the effect on the variable *Trade Taxes* is equal to -6.77 percent, which is roughly equivalent

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[37] To visually inspect whether the overlap assumption holds, in figures A1 and A2 in the Appendix, we present the smoothed, using a standard Epanechnikov kernel, densities of the estimated propensities between the two groups. As the reader can verify, there is considerable overlap among treated and control propensities. More importantly the control observations cover the support for all treated observations. This provides support for the required overlap assumption and gives suggestive evidence in favor of our empirical strategy. For more details about the assumptions used to estimate the inverse probability weighting model, see Imbens and Wooldridge (2009) and Angrist and Pischke (2009).

to a 1/3 standard deviation of the latter variable in our sample. A similar effect is predicted when we use the variable *Indirect Taxes.*

Table 4-2:OLS Results

	(1) Total Taxes	(2) Taxes on Income	(3) Income/indirect	(4) Trade Taxes	(5) Indirect Taxes
State Religion	-3.770***	-1.254**	-18.226*	-6.772**	-8.366**
	(-3.268)	(-2.166)	(-1.721)	(-2.271)	(-2.388)
French	-1.679	-1.273**	-7.799	-1.778	4.952
Legal Origin	(-1.001)	(-2.008)	(-0.472)	(-0.435)	(1.160)
Socialist	2.559	-2.387**	-63.894***	-14.705*	3.261
Legal Origin	(0.630)	(-2.142)	(-3.058)	(-1.938)	(0.560
German	-1.930	-1.806*	-8.658	1.278	-2.695
Legal Origin	(-0.906)	(-1.865)	(-0.321)	(0.220)	(-0.711)
Scandinavian	9.438***	5.330**	10.063	6.466	4.910
Legal Origin	(3.041)	(2.103)	(0.475)	(1.384)	(1.054)
External Conflict	10.258	-1.921	-75.313	-19.571	-9.505
up to 1975	(1.637)	(-0.679)	(-1.286)	(-1.301)	(-0.737)
Parliamentary Democracy	3.708**	1.715**	-10.318	-3.818	2.638
up to 1975	(2.582)	(2.023)	(-0.582)	(-1.014)	(0.587)
Democracy	1.406	1.487*	24.777*	6.596*	10.150**
up to 1975	(0.955)	(1.845)	(1.762)	(1.809)	(2.273)
Observations	143	136	135	141	140
R2	0.510	0.720	0.207	0.336	0.483
F	7.176042	16.70971	1.68537	3.435421	6.284952

Robust t-statistics in parenthesis. F-test denotes the significance of the model. All estimations include regional dummies and a constant term. (*p < 0.10; **p < 0.05; ***p < 0.01).

Regarding the other controls, we find that the effect of the external conflict has the expected sign, however, is statistically significant only when we proxy fiscal capacity only on columns (1) and (5). The effect of the existence of parliamentary democracy in 1975 is negative but not statistically significant in every column of Table 4-2 except for column (1) where we use total taxes. On the other hand, the effect of democracy is positive and statistically significant, supporting the findings of the existing literature. Also, parliamentary democracy is positive and statistically significant in the first two columns but changes sign and loses significance in the last three. Finally, legal origins have a similar effect on fiscal capacity as in Besley and Persson (2008).

The econometric problem with the above analysis is that state religion is not randomly assigned across countries. As we argued in the previous section, fiscal capacity may affect the decision to adopt a state religion. For this reason, we use a potential outcomes framework to create randomization across countries. Thus, in Table 4-3 we estimate an inverse probability weighting model. In each column of all these tables, the dependent variable is a different proxy of fiscal capacity, as in Table 4-2.

The upper panel indicates the estimated average treatment effects on the treated (ATET). On the bottom panel, we present the results from the first-stage probit model. For all proxies of fiscal capacity, the ATET is negative and statistically significant. In other words, countries with a state religion experience lower levels of fiscal capacity, a result that verifies the findings of the OLS model of Table 4-2.

Interestingly, the estimated effects are quantitatively similar to those obtained with the OLS specification.

Regarding the control variables in the probit model, our results verify the existing findings of the literature. The effect of communism is negative and statistically significant for countries that were under a communist regime in 2000. Similarly, and in contrast to the secularization hypothesis, more developed countries appear to have a higher probability of adopting a state religion, supporting the idea that in developed countries people contribute more to religious denominations. Also, *population* and *population squared* and the ratio of the adherents of *main/secondary* religion have the expected signs. Finally, an increase in *Executive Constraints* leads to a lower probability of having a state religion. This is consistent with the view that more liberal political regimes are correlated with the absence of state religions.[38] We should also note that the LR test of the probit model never rejects the underlying first-stage results. Moreover, the overidentification test for covariate balancing never rejects the null, indicating that covariates are balanced, suggesting that the first-stage model is properly modeled.

In Table 4-4, we examine the robustness of our main results. To save space and to focus on our main results, in this table we only present the ATET of state religion on fiscal capacity measures, as in the previous tables.[39]

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[38] As a further robustness, in the appendix we present the results when we use alternative potential outcome models. Specifically, we present the results with a regression adjustment model, which models fiscal capacity with a linear regression model, and estimates the ATET as the difference in the predicted fiscal capacity between countries with and without state religion. We also present the results of a Doubly Robust model, which performs an Inverse Probability Weighting on the regression adjustment model. The benefit of this model is that it requires only one of the regression adjustment and the Inverse Probability Weighting models to be correctly specified. As the reader can easily verify, all three methods lead to the same results.

[39] The first-stage results are presented in the appendix.

Table 4-3:Inverse Probability Weighting

	(1) Total Taxes	(2) Taxes on Income	(3) Income/Indirect	(4) Trade Taxes	(5) Indirect Taxes
ATET	-2.444* (-1.835)	-1.493* (-1.863)	-27.231** (-2.041)	-7.288** (-2.317)	-8.060*** (-3.114)
1st Stage Probit					
Communist	0.210	0.239	0.277	0.252	0.196
in 1985	(0.714)	(0.803)	(0.905)	(0.834)	(0.666)
Communist	-2.993***	-3.280***	-3.679***	-2.972***	-3.456***
in 2000	(-8.086)	(-8.659)	(-9.736)	(-7.836)	(-9.564)
GDP per capita	0.152	0.1117	0.107	0.143	0.142
	(1.293)	(0.971)	(0.883)	(1.207)	(1.203)
Population	5.406***	5.497***	5.402***	5.323***	4.863***
	(3.010)	(3.009)	(2.901)	(2.899)	(2.725)
Population	-0.165***	-0.168***	-0.164***	-0.162***	-0.149***
Squared	(-2.981)	(-2.983)	(-2.858)	(-2.855)	(-2.716)
Executive	-0.138**	-0.154**	-0.143**	-0.130*	-0.136*
Constraints	(-2.042)	(-2.220)	(-2.012)	(-1.878)	(-2.011)
Main/Secondary	2.806***	2.658***	2.637***	2.757***	2.783***
Religion Shares	(6.330)	(6.053)	(6.033)	(6.241)	(6.235)
Observations	146	139	137	143	142
Treated Observations	60	56	56	58	56
First-Stage Chi-square	66.14	60.37	58.71	62.30	63.47
1st Stage pseudo R2	34.19	32.95	32.55	33.30	33.61
Overid test	1.97(0.98)	1.56(0.99)	2.02(0.97)	1.49(0.99)	2.05(0.97)

Notes: T-statistics in parentheses. ATET denotes the average treatment effect on the treated. Treated observations refer to the number of countries that receive the treatment (i.e., countries that are state religions). The first stage Chi-square and the pseudo R2 report the LR test and the pseudo R2 of the first stage probit regression. The overid test reports the chi-square overidentification test for covariate balance (p-values in the parentheses). A rejection of the null implies that covariates are not balanced. Additional tests and graphs are reported in the appendix. (* p<0.10, ** p<0.05, *** p<0.01)

As a first test, in column (1) we introduce the religious shares of the four main faiths to make sure that they are not the types of religion that affect both the probability of having a state religion and the quality of fiscal institutions. For example, one may argue that state religion is most prevalent in Islamic countries. At the same time, in Islamic countries, there are forms of religious-specific taxes, e.g., the Zakat tax, which is a tax obligation for all Muslims with certain criteria of wealth, computed as a fixed share of their agricultural output or of their other assets. The revenues of Zakat are used to finance governance, defense, etc. Kuran (2003). Our results verify that this is not the case: irrespective of the measure of fiscal capacity, our results remain unchanged after the inclusion of the religious shares in the first-stage probit regression.

In columns (2) and (3), we exclude the five percent richest and poorest countries, in terms of real GDP per capita, in our sample, respectively. This way, we make sure that our results are not driven by the high (*resp.* low) income countries, where fiscal capacity is high (*resp.* low). In all instances, our results remain intact.

One issue that is worth examining is the robustness of our results to the definition of a state religion. Even though the definition of Barrett et al. (2001) is quite broad we want to make sure that our results are not driven by it.

Table 4-4:Inverse probability weighting, Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ATET of State Religion on						State Religion Religion and State Database	Excluding Decentralized Religions
	Religion Shares	Excl. Richest	Excl. Poorest	State Religion I	State Religion II		
Total Taxes	-2.425**	-3.281***	-2.444*	-1.850	-2.348*	-3.871**	-0.372
	(-2.031)	(-2.627)	(-1.768)	(-1.439)	(-1.771)	(-2.489)	(-0.244)
Income Taxes	-1.477*	-2.040***	-1.475*	-1.198	-1.372*	-2.483**	-0.664
	(-1.959)	(-2.811)	(-1.787)	(-1.571)	(-1.758)	(-2.517)	(-0.704)
Income/Indirect	-24.099**	-32.247**	-24.579**	-33.885*	-27.417*	-49.454*	-20.343*
	(-1.966)	(-2.314)	(-1.961)	(-1.827)	(-1.908)	(-1.850)	(-1.658)
Trade Taxes	-7.530***	-8.642***	-8.668***	-7.652***	-7.652***	-9.941**	-2.336*
	(-2.869)	(-3.308)	(-3.478)	(-2.936)	(-2.936)	(-2.342)	(-1.889)
Indirect Taxes	-7.435**	-8.646***	-6.744**	-7.117**	-7.150**	-16.306***	-6.194**
	(-2.395)	(-2.784)	(-2.054)	(-2.243)	(-2.318)	(-3.692)	(-2.134)

Note: The table presents the ATET of State Religion on the respective measure of fiscal capacity in each row. The first stage results probit are computed using the same variables in the Table 3, except in column (1) where we also include the shares of adherents of the main religions as moderators. t-statistics in parenthesis. (* p<0.1, ** p<0.05, *** p<0.01).

Hence, in columns (4) and (5) we extend the definition of a state religion to cases where even though there is no constitutional or legal provision to classify the country as having a state religion, there is a "monopoly" of a particular religion, in the sense that most adherents follow a particular denomination.

To this end, we have computed the Herfindahl index of all main religions and assumed that when this index takes a value above 8,500, then the country is classified as having a state religion. In column (5), to compute the Herfindahl index we use the share of adherents excluding the non-religious group. As the reader can easily verify, our results do not change significantly even in this case.[40]

In column (6) we present the results if we use an alternative measure of the existence of a state religion. Specifically, we use the data from the Religion and State database (Fox 2019). Following the coding of this dataset, we consider a country to have a state religion if there is a constitutional clause, a law, or the equivalent explicitly stating that a specific religion or specific religions are the official religions of that state. As the results in column (6) verify, our results are not driven by the choice of the state religion variable: in all cases, the results using this latter variable are qualitatively the same. Moreover, the estimated ATET is very close to the one estimated in our main specification.

Finally, in column (7) we perform an additional robustness test. As in many countries there is a dominant religion that might possess a decentralized status (i.e., Islam, Buddhism, Judaism, Hinduism), with no "genuine church" that the state might integrate with, we exclude from our sample the 10 percent of countries with the highest

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[40] The Herfindahl index is computed for the year 2000, the same year that we use for the state religion variable.

shares of these religions. Except for the two first measures of fiscal capacity, which now lose part of the statistical significance but remain correctly signed, the rest of the results are the same as in the previous columns.

Given the results of the cross-section models, we proceed further into examining our hypothesis, using historical data. Even though we have data available for only 44 countries, the historical panel data model allows us to control for country and time fixed effects and examine the dynamics of the underlying relationship. After all, any changes in fiscal capacity will eventually take time to materialize. Thus, church-state separation is expected to affect fiscal capacity with a time lag. For these reasons, we employ a dynamic inverse probability weighting model.[41]

In Table 4-5 we present the results using this analysis. For each of the outcome variables, i.e., variables *Custom Taxes* and *Direct Taxes*, we examine changes in the treatment that appear as either an establishment or disestablishment of a state religion.[42]

The common result in all four cases is that the effect of a change in the church-state relationship affects fiscal capacity with a significant time lag, i.e., after approximately 13 years. Furthermore, our results indicate that the establishment of a state-religion reduces both measures of fiscal capacity. This negative effect kicks in after approximately 18 years, when fiscal capacity is proxied by *Custom Taxes*, and 13 years, when *Direct Taxes* proxies fiscal capacity. In contrast, when there is a separation of church from the state, there is a positive effect, which is exhibited after 13 years, in

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[41] The Dynamic Inverse Probability Weighting model has the added advantage that it estimates a causal effect in a semi-parametric manner. The control variables are lagged values of the fiscal capacity measure. Furthermore, given the nature of our data, i.e., historical from 1900, it is difficult to find valid instruments so as to derive causal effects.

[42] Standard errors are computed using 100 bootstraps.

the case on *Custom Taxes*, and after 22 years, when we use the variable *Direct Taxes*.

Even though the effect on the two variables does not occur after the same number of years, these results provide support to the idea that any changes in fiscal capacity take time to occur, and hence can be considered a long-run effect.

Table 4-5: Dynamic Inverse Probability Weighting

	(1) -5 to 0 years	(2) 1 to 4 years	(3) 5 to 8 years	(4) 9 to 12 years	(5) 13 to 17 years	(6) 18 to 21 years	(7) 22 to 26 years	(8) 27 to 31 years
ATET on One minus Custom Taxes								
Establishment of State Religion	-0.017	0.013	0.007	-0.010	-0.026	-0.047**	-0.050*	-0.06*
	(1.01)	(0.92)	(0.38)	(-0.066)	(-1.23)	(-1.96)	(-1.92)	(-1.76)
Disestablishment of State Religion	0.001	0.005	0.026	0.062	0.063**	0.020	-0.012	-0.032
	(0.05)	(1.01)	(0.83)	(1.55)	(2.17)	(0.47)	(0.27)	(0.72)
ATET on Direct Taxes								
Establishment of State Religion	-0.006	0.001	-0.015	-0.059	-0.108***	-0.0141	-0.122*	-0.158*
	(-0.42)	(0.05)	(-0.53)	(-1.51)	(-2.57)	(-0.20)	(-1.93)	(-1.90)
Disestablishment of State Religion	0.010	0.013	0.087	0.004	-0.003	0.026	0.044*	0.078**
	(0.83)	(0.81)	(1.10)	(0.09)	(-0.09)	(1.13)	(1.69)	(2.29)

Notes: Coefficients show the average treatment effects on the treated (ATET). We present the ATET, using the inverse probability weighting and procedure, to compute the counterfactual. T-statistics obtained using 100 bootstraps are presented in the parentheses. All results are for 44 countries, 6 treatments when we estimate the effect of the establishment of state religion and 15 treatments when we estimate the disestablishment of a state religion, on fiscal capacity. (* $p<0.10$, ** $p<0.05$, *** $p<0.01$)

4.4 Conclusions

In this chapter, we have tried to examine whether the relationship between the church and the state affects the decision to invest in fiscal capacity. Historically, the church has been an important agent within all countries and the state-church relationship has influenced the history and development of almost all nations. This chapter therefore contributes to the literature that examines the effect of the church on the fiscal system.

Our results extend and verify the so-called legitimization hypothesis, which states that when the state faces fiscal difficulties it uses the church to gain legitimization and increase its tax collection. Our argument goes one step further, by suggesting that in the long run this may turn out to be a strategy that hurts the development of state institutions. According to our empirical results and theoretical argument, poor tax collecting performance co-exists with a state religion. The absence of competition among the state and the church induces slack on behalf of the state, which is manifested with lower investment in fiscal capacity. In this respect, our results shed light on the role of church/religion on the development of fiscal institutions over time.

Appendix

Table A 4-1: Regression Adjustment

	(1)	(2)	(3)	(4)	(5)
	Total Taxes	Taxes on Income	Income/Indirect	Trade Taxes	Indirect Taxes
ATET	-3.003***	-1.081*	26.257	-3.954*	-5.135**
	(-3.048)	(-1.827)	(0.617)	(-1.733)	(-2.199)
			Regression Untreated		
English	-0.328	-1.463*	-6.720	-0.297	3.209**
Legal Origin	(-0.471)	(-1.789)	(-0.889)	(-0.178)	(2.260)
Socialist	2.037	-0.459	9.771	-0.572	-8.958***
Legal Origin	(1.268)	(-0.409)	(0.463)	(-0.105)	(-2.687)
French	3.965	-0.641	-33.781	-8.472	4.541
Legal Origin	(1.226)	(-0.641)	(-1.428)	(-1.158)	(0.820)
External Conflict	1.425	-2.669	-32.659	-5.636	5.297
up to 1975	(0.253)	(-0.864)	(-0.403)	(-0.362)	(0.391)
Parliamentary Democracy	3.444**	0.891	-21.453	-4.375	1.133
up to 1975	(2.432)	(1.034)	(-1.205)	(-1.184)	(0.265)
Democracy	0.120	1.824**	35.707**	10.085***	14.268***
up to 1975	(0.077)	(2.088)	(2.161)	(2.598)	(3.148)
			Regression Treated		
English	-10.006**	-10.563***	-104.592	-26.328***	-4.606
Legal Origin	(-2.418)	(-2.842)	(-0.933)	(-2.777)	(-0.530)
Socialist	-17.326***	-21.976***	-1312.439*	-76.898***	-20.581**
Legal Origin	(-2.806)	(-3.108)	(-1.654)	(-3.966)	(-2.029)
French	-11.329***	-9.682***	-186.254	-15.416**	4.701
Legal Origin	(-3.358)	(-2.638)	(-1.345)	(-2.249)	(1.066)
External Conflict	6.927	5.254	-143.873	29.387	16.239
up to 1975	(0.866)	(1.489)	(-0.386)	(1.594)	(1.075)
Parliamentary Democracy	3.886	1.621	-330.466	-7.013	-2.884
up to 1975	(1.519)	(0.665)	(-1.317)	(-0.818)	(-0.331)
Democracy up 1975	0.140	-0.547	-58.000	7.088	14.206**
up to 1975	(0.085)	(-0.523)	(-1.020)	(1.279)	(2.474)
Observations	179	171	169	175	174
Treated Observations	70	65	65	68	67

See notes in table 3.

Table A 4-2: Doubly Robust

	(1) Total Taxes	(2) Taxes on Income	(3) Income/Indirect	(4) Trade Taxes	(5) Indirect Taxes
ATET	-1.691*	-1.940***	-25.454***	-7.492***	-8.578***
	(-1.768)	(-2.958)	(-3.084)	(-2.892)	(-3.706)
Regression Untreated					
English	3.926	-0.057	-2.116	-4.606	-3.375
Legal Origin	(-1.631)	(-0.030)	(-0.111)	(-1.270)	(-1.000)
Socialist	-11.541***	-4.928***	-24.585	11.199**	3.863
Legal Origin	(-4.751)	(-2.917)	(-1.626)	(2.286)	(0.446)
French	-2.793	0.281	18.504	-0.370	1.740
Legal Origin	(-1.287)	(0.162)	(1.196)	(-0.118)	(0.535)
External Conflict	1.543	-6.476**	-107.691***	-17.505***	-5.568
up to 1975	(0.345)	(-2.223)	(-3.610)	(-3.031)	(-0.613)
Parliamentary	4.468**	-3.295*	-78.381**	-21.873***	16.629***
Democracy					
up to 1975	(2.092)	(-1.943)	(-2.620)	(-3.041)	(2.970)
Democracy	-0.217	0.462	-23.834	-6.605	-1.521
up to 1975	(-0.099)	(0.380)	(-1.118)	(-1.345)	(-0.256)
Regression Treated					
English	-14.000**	-13.710***	-90.828***	-33.288***	3.595
Legal Origin	(-2.338)	(-2.734)	(-2.592)	(-2.905)	(0.424)
Socialist	-14.243	-16.912***	-174.569***	-70.964***	0.234
Legal Origin	(-1.620)	(-2.794)	(-2.709)	(-3.280)	(0.018)
French	-12.571**	-11.539***	-57.436*	-29.595**	14.510
Legal Origin	(-2.129)	(-2.304)	(-1.616)	(-2.243)	(1.560
External Conflict	13.750	8.987**	85.177*	46.777**	9.580
up to 1975	(1.253)	(2.037)	(1.777)	(2.514)	(0.472)
Parliamentary	6.132	4.136	28.519	-5.129	11.901
Democracy					
up to 1975	(1.177)	(1.530)	(1.028)	(-0.380)	(0.998)
Democracy	1.289	-0.051	3.449	2.295	10.539*
up to 1975	(0.653)	(-0.043)	(0.269)	(0.396)	(1.659)
Probit Model					
Communist	0.210	0.239	0.277	0.252	0.196
in 1985	(0.713)	(0.803)	(0.905)	(0.834)	(0.666)
Communist	-3.613***	-3.722***	-3.614***	-3.701***	-3.103***
in 2000	(-10.091)	(-10.017)	(-9.538)	(-10.145)	(-8.434)
GDP	0.152	0.117	0.107	0.143	0.142
per capita	(1.293)	(0.971)	(0.883)	(1.207)	(1.203)
Population	5.406***	5.490***	5.402***	5.323***	4.863***
	(3.009)	(3.009)	(2.901)	(2.898)	(2.725)
Population	-0.165***	-0.168***	-0.164***	-0.162***	-0.149***
Squared	(-2.981)	(-2.893)	(-2.858)	(-2.855)	(-2.716)
Executive	-0.138**	-0.154**	-0.143**	-0.130*	-0.136**
Constraints	(-2.042)	(-2.220)	(-2.012)	(-1.878)	(-2.011)
Main/Secondary	2.806***	2.658***	2.637***	2.757***	2.783***
Religion Shares	(6.330)	(6.053)	(6.033)	(6.241)	(6.235)
Observations	146	139	137	143	142
number of treated countries	60	56	56	58	57

Figure A 4-1: Overlap plots, cross section

Total Taxes

Taxes on Income

Income/Indirect Taxes

Trade Taxes
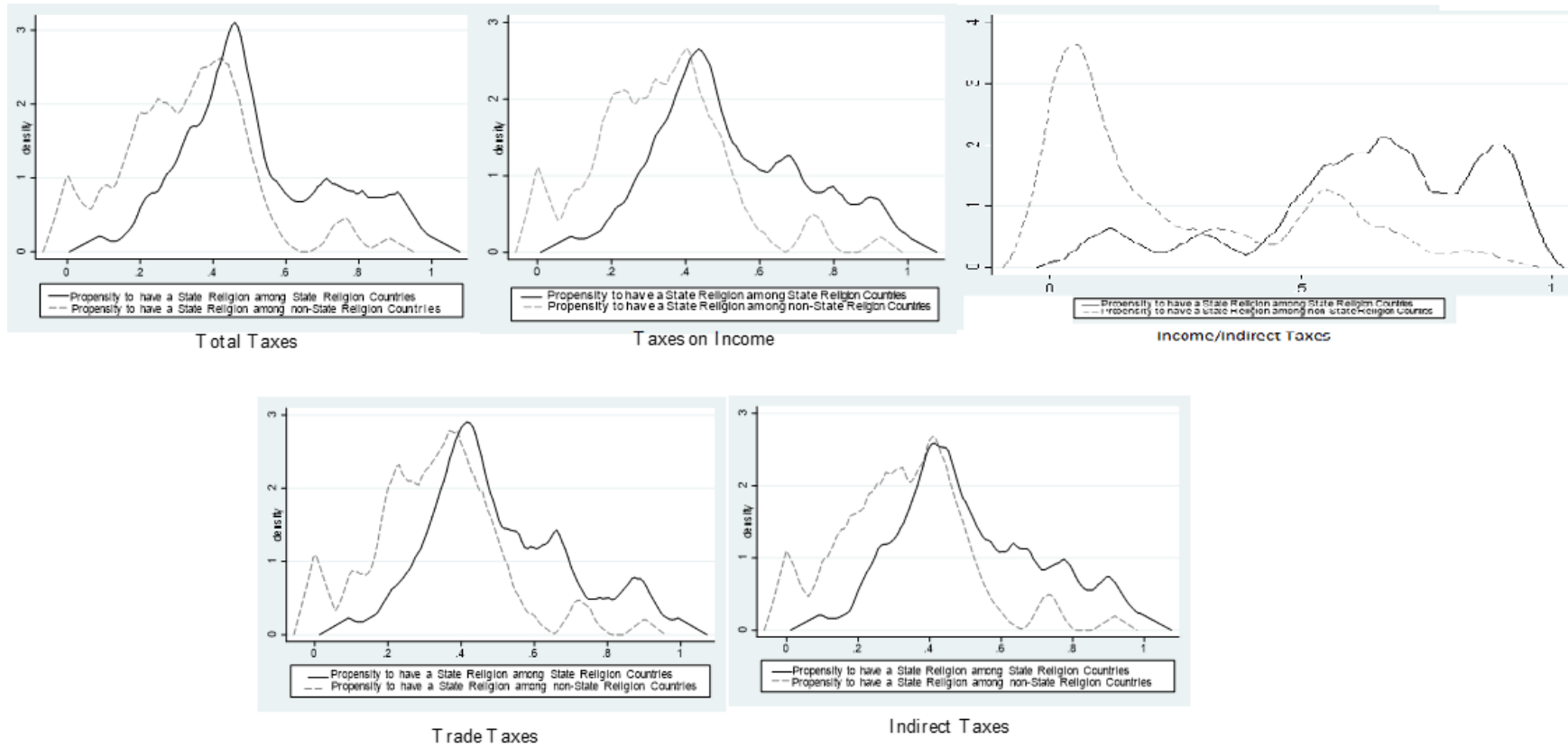
Indirect Taxes

Figure A 4-2: Overlap plots, panel data
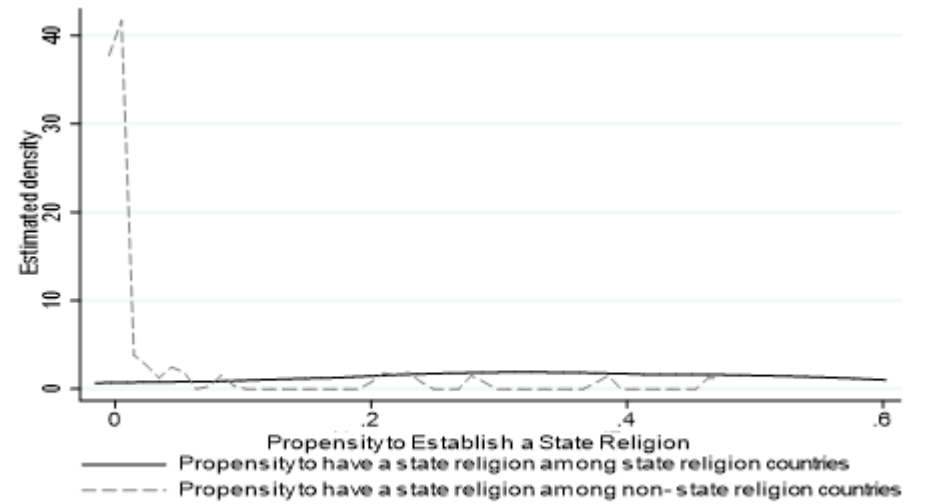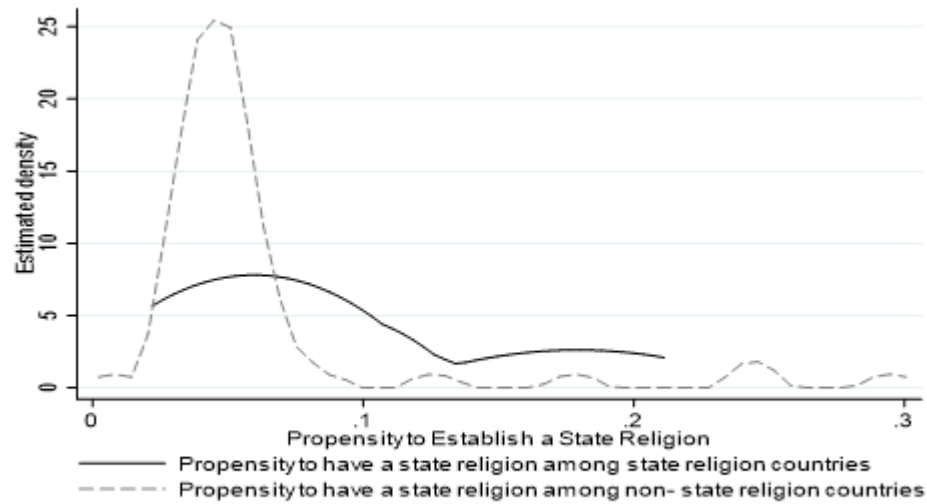
State religion establishment - Trade Taxes

State religion establishment - Direct Taxes
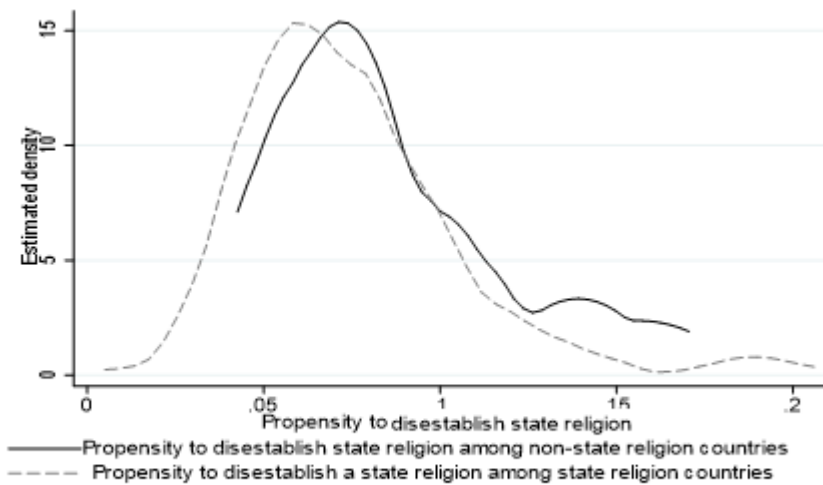
State religion separation - Trade Taxes
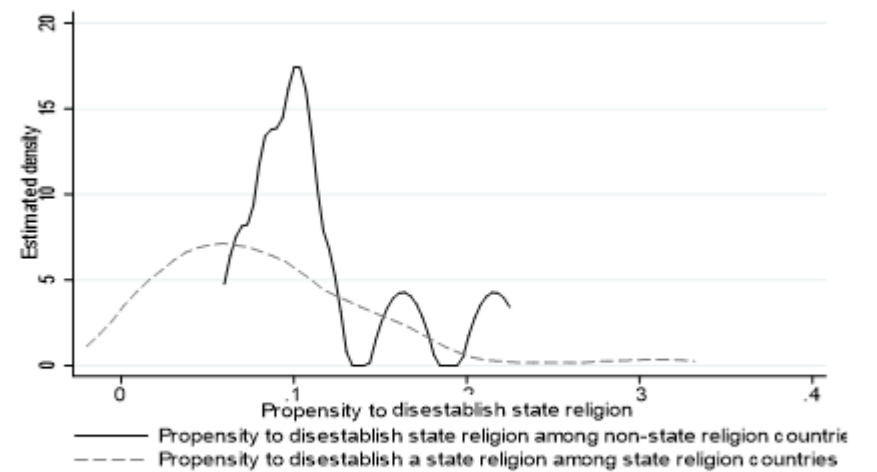
State religion separation - Direct Taxes

Table A 4-3:Full results of table 5

Total Taxes	(1)	(2)	(3)	(4)	(5)	(6)	(7)
						State Religion Religion and State Database	Excluding Decentralized Religions
	Religion Shares	Excl. Richest	Excl. Poorest	State Religion I	State Religion II		
ATET	-2.425**	-3.281***	-2.444*	-1.850	-2.348*	-3.871**	-0.372
	(-2.031)	(-2.627)	(-1.768)	(-1.439)	(-1.771)	(-2.489)	(-0.244)
1st Stage Probit							
Communist in 2000	-3.087***	-3.010***	-2.977***	-2.867***	-2.891***	-2.592***	-3.043***
	(-6.832)	(-8.036)	(-8.034)	(-7.795)	(-7.871)	(-5.120)	(-7.089)
Communist in 1985	0.281	0.185	0.163	0.145	0.168	-0.437	0.248
	(0.951)	(0.627)	(0.547)	(0.487)	(0.564)	(-1.235)	(0.759)
GDP per capita	0.163	0.178	0.091	0.071	0.095	0.235	-0.070
	(1.334)	(1.406)	(0.737)	(0.585)	(0.797)	(1.612)	(-0.830)
Population	5.515***	5.409***	5.736***	3.205**	3.989**	3.403	2.591***
	(3.079)	(2.957)	(3.151)	(2.119)	(2.449)	(1.566)	(4.726)
Population Squared	-0.168***	- 0.165***	- 0.175***	-0.099**	-0.122**	-0.098	0.137
	(-3.052)	(-2.922)	(-3.121)	(-2.138)	(-2.444)	(-1.487)	(0.887)
Executive Constraints	-0.104	-0.149**	-0.125*	-0.106	-0.101	-0.316***	6.434***
	(-1.256)	(-2.165)	(-1.850)	(-1.553)	(-1.505)	(-3.529)	(2.934)
Main/Secondary Religion Shares	2.971***	2.606***	2.853***	3.138***	3.047***	3.035***	-0.198***
	(4.815)	(5.686)	(6.368)	(6.891)	(6.74)	(4.279)	(-2.932)
Muslim	-0.104						
	(-0.113)						
Christian	-1.02						
	(-0.605)						
Protestant	-0.1						
	(-0.097)						
Observations	146	139	137	143	142	130	105

Income Taxes	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Religion Shares	Excl. Richest	Excl. Poorest	State Religion I	State Religion II	State Religion Religion and State Database	Excluding Decentralized Religions
ATET	-1.477*	-2.040***	-1.475*	-1.198	-1.372*	-2.483**	-0.664
	(-1.959)	(-2.811)	(-1.787)	(-1.571)	(-1.758)	(-2.517)	(-0.704)
1st Stage Probit							
Communist in 2000	-3.324***	-3.337***	-3.268***	-3.425***	-3.453***	-0.46	-3.656***
	(-7.384)	(-8.659)	(-8.614)	(-9.446)	(-9.518)	(-1.296)	(-8.591)
Communist in 1985	0.286	0.203	0.183	0.17	0.192	-2.380***	0.259
	(0.961)	(0.686)	(0.61)	(0.569)	(0.643)	(-4.615)	(0.790)
GDP per capita	0.129	0.151	0.046	0.033	0.059	0.24	-0.098
	(1.051)	(1.17)	(0.362)	(0.269)	(0.481)	(1.643)	(-1.147)
Population	5.515***	5.409***	5.736***	3.205**	3.989**	3.503	2.465***
	(3.079)	(2.957)	(3.151)	(2.119)	(2.449)	(1.619)	(4.493)
Population Squared	-0.168***	-0.165***	-0.175***	-0.099**	-0.122**	-0.1	0.112
	(-3.052)	(-2.922)	(-3.121)	(-2.138)	(-2.444)	(-1.535)	(0.720)
Executive Constraints	-0.104	-0.149**	-0.125*	-0.106	-0.101	-0.314***	6.795***
	(-1.256)	(-2.165)	(-1.850)	(-1.553)	(-1.505)	(-3.452)	(2.985)
Main/Secondary Religion Shares	2.971***	2.606***	2.853***	3.138***	3.047***	3.151***	-0.210***
	(4.815)	(5.686)	(6.368)	(6.891)	(6.74)	(4.317)	(-2.984)
Muslim	-0.104						
	(-0.113)						
Christian	-1.020						
	(-0.605)						
Protestant	-0.100						
	(-0.097)						
Observations	139	132	135	139	139	129	99

Indirect Taxes	(1)	(2)	(3)	(4)	(5)	(6) State Religion Religion and State Database	(7) Excluding Decentralized Religions
	Religion Shares	Excl. Richest	Excl. Poorest	State Religion I	State Religion II		
ATET	-7.435**	-8.646***	-6.744**	-7.435**	-8.646***	-16.306***	-6.194**
	(-2.395)	(-2.784)	(-2.054)	(-2.395)	(-2.784)	(-3.692)	(-2.134)
1st Stage Probit							
Communist in 1985	-3.041***	-3.130***	-3.032***	-3.031***	-3.054***	-0.46	-2.940***
	(-6.474)	(-8.242)	(-8.039)	(-7.995)	(-8.063)	(-1.296)	(-6.715)
Communist in 2000	0.327	0.23	0.202	0.187	0.211	-2.477***	0.272
	(1.081)	(0.763)	(0.663)	(0.614)	(0.693)	(-4.815)	(0.822)
GDP per capita	0.151	0.167	0.08	0.064	0.086	0.24	-0.073
	(1.233)	(1.317)	(0.641)	(0.529)	(0.719)	(1.643	(-0.871)
Population	5.448***	5.293***	5.684***	3.098**	3.886**	3.503	2.523***
	(2.985)	(2.829)	(3.042)	(2.06)	(2.387)	(1.619	(4.599)
Population Squared	-0.166***	-0.161***	-0.173***	-0.095**	-0.118**	-0.1	0.142
	(-2.943)	(-2.780)	(-2.997)	(-2.067)	(-2.369)	(-1.535)	(0.930)
Executive Constraints	-0.095	-0.141**	-0.116*	-0.1	-0.093	-0.314***	6.260***
	(-1.138)	(-2.004)	(-1.667)	(-1.431)	(-1.355)	(-3.452)	(2.733)
Main/Secondary Religion Shares	2.954***	2.556***	2.806***	3.094***	3.003***	3.151***	-0.193***
	(4.772)	(5.59)	(6.28)	(6.812)	(6.656)	(4.317)	(-2.713)
Muslim	-0.157						
	(-0.169)						
Christian	-1.152						
	(-0.684)						
Protestant	-0.119						
	(-0.117)						
Observations	143	135	139	143	143	129	103

Trade Taxes	(1) Religion Shares	(2) Excl. Richest	(3) Excl. Poorest	(4) State Religion I	(5) State Religion II	(6) State Religion Religion and State Database	(7) Excluding Decentralized Religions
ATET	-7.530***	-8.642***	-8.668***	-7.652***	-7.652***	-9.941**	-2.336*
	(-2.869)	(-3.308)	(-3.478)	(-2.395)	(-2.395)	(-2.342)	(-1.889)
1st Stage Probit							
Communist in 2000	-3.402***	-3.264***	-2.979***	-3.330***	-3.330***	-2.581***	-2.987***
	(-7.472)	(-8.843)	(-8.033)	(-9.238)	(-9.238)	(-5.030)	(-6.802)
Communist in 1985	0.274	0.173	0.147	0.148	0.148	-0.460	0.240
	(0.929)	(0.589)	(0.495)	(0.497)	(0.497)	(-1.296)	(0.734)
GDP per capita	0.154	0.167	0.08	0.082	0.082	0.24	-0.062
	(1.264)	(1.315)	(0.641)	(0.683)	(0.683)	(1.643)	(-0.719)
Population	4.970***	4.874***	5.174***	3.415**	3.415**	3.503	2.494***
	(2.799)	(2.675)	(2.865)	(2.165)	(2.165)	(1.619)	(4.526)
Population Squared	-0.153***	-0.149***	-0.158***	-0.105**	-0.105**	-0.1	0.138
	(-2.794)	(-2.659)	(-2.854)	(-2.184)	(-2.184)	(-1.535)	(0.903)
Executive Constraints	-0.099	-0.147**	-0.124*	-0.101	-0.101	-0.314***	6.434***
	(-1.200)	(-2.131)	(-1.821)	(-1.487)	(-1.487)	(-3.452)	(2.946)
Main/Secondary Religion Shares	2.929***	2.583***	2.834***	3.046***	3.046***	3.151***	-0.198***
	(4.805)	(5.577)	(6.269)	(6.662)	(6.662)	(4.317)	(-2.940)
Muslim	-0.037						
	(-0.041)						
Christian	-0.999						
	(-0.602)						
Protestant	-0.047						
	(-0.046)						
Observations	142	134	138	142	142	129	103

Income/Indirect	(1) Religion Shares	(2) Excl. Richest	(3) Excl. Poorest	(4) State Religion I	(5) State Religion II	(6) State Religion Religion and State Database	(7) Excluding Decentralized Religions
ATET	-24.099**	-32.247**	-24.579**	-33.885*	-32.247**	-49.454*	-20.343*
	(-1.966)	(-2.314)	(-1.961)	(-1.827)	(-2.314)	(-1.850)	(-1.658)
1st Stage Probit							
Communist in 2000	-3.849***	-3.851***	-3.658***	-3.543***	-3.564***	-0.46	-3.445***
	(-8.295)	(-10.104)	(-9.675)	(-9.415)	(-9.476)	(-1.296)	(-7.919)
Communist in 1985	0.322	0.244	0.218	0.209	0.233	-2.579***	0.275
	(1.05)	(0.799)	(0.706)	(0.681)	(0.759)	(-5.027)	(0.823)
GDP per capita	0.116	0.141	0.034	0.027	0.05	0.24	-0.098
	(0.935)	(1.082)	(0.263)	(0.215)	(0.403)	(1.643)	(-1.152)
Population	5.536***	5.441***	5.830***	3.160**	3.944**	3.503	2.457***
	(2.953)	(2.86)	(3.06)	(2.078)	(2.391)	(1.619)	(4.490)
Population Squared	-0.169***	-0.165***	-0.177***	-0.097**	-0.120**	-0.1	0.113
	(-2.912)	(-2.814)	(-3.015)	(-2.084)	(-2.372)	(-1.535)	(0.728)
Executive Constraints	-0.113	-0.154**	-0.129*	-0.112	-0.104	-0.314***	6.538***
	(-1.321)	(-2.106)	(-1.807)	(-1.560)	(-1.481)	(-3.452)	(2.765)
Main/Secondary Religion Shares	2.800***	2.454***	2.691***	2.980***	2.889***	3.151***	-0.201***
	(4.531)	(5.411)	(6.058)	(6.634)	(6.476)	(4.317)	(-2.747)
Muslim	-0.158						
	(-0.173)						
Christian	-0.983						
	(-0.597)						
Protestant	-0.219						
	(-0.203)						
Observations	137	130	133	137	137	129	103

Table A 4-4: Country List, cross section model

Afghanistan*	Guatemala*	Pakistan*
Albania	Guinea	Panama*
Angola	Guinea-Bissau	Papua New Guinea
Argentina*	Guyana	Paraguay*
Australia	Haiti*	Peru*
Austria	Honduras*	Philippines
Bahamas*	Hungary	Poland
Bahrain*	Iceland*	Portugal*
Bangladesh*	India	Qatar*
Barbados	Indonesia	Romania
Belgium	Iran*	Rwanda
Benin	Iraq*	Sao Tome and Principe
Bhutan*	Ireland	Saudi Arabia*
Bolivia*	Israel*	Senegal
Botswana	Italy*	Seychelles
Brazil	Jamaica	Sierra Leone
Bulgaria*	Japan	Singapore
Burkina Faso	Jordan*	Solomon Islands
Burundi	Kenya	Somalia*
Cambodia*	Kiribati	South Africa
Cameroon	Korea, South	Spain*
Canada	Kuwait*	Sri Lanka*
Cape Verde	Laos	St Lucia
Central African Rep..	Lebanon	Sudan*
Chad	Lesotho	Suriname
Chile	Liberia*	Swaziland
China	Libya*	Sweden
Colombia*	Luxembourg*	Switzerland
Congo	Madagascar	Syria
Congo, Democratic R..	Malawi	Tanzania
Costa Rica*	Malaysia *	Thailand*
Cote d'Ivoire	Maldives*	Togo
Cuba	Mali	Tonga*

Cyprus	Malta*	Trinidad and Tobago
Denmark*	Mauritania*	Tunisia*
Djibouti	Mauritius	Turkey
Dominica	Mexico	Uganda
Dominican Republic*	Mongolia	United Arab Emirates*
Ecuador	Morocco*	United Kingdom*
Egypt*	Mozambique	United States
El Salvador*	Myanmar	Uruguay
Equatorial Guinea	Nepal*	Venezuela*
Fiji	Netherlands	Vietnam
Finland*	New Zealand	Zambia
France	Nicaragua	Zimbabwe
Gambia	Niger	
Ghana	Nigeria	
Greece*	Norway*	
Grenada	Oman*	

* Denote countries with a state religion

Table A 4-5: Country List, panel model

Country	Year of Establishment	Year of Disestablishment
Argentina*		
Australia		
Austria		1919
Belgium		
Brazil		
Bulgaria	1895	
Canada		
Chile		
Colombia		1992
Czechoslovakia		
Denmark*		
France		1906
Germany		
Greece*		
Hungary		
India		
Indonesia*		
Iran	1979	
Ireland		1973
Italy*		
Japan		1946
Korea		1948
Mexico		
Netherlands		
New Zealand		
Norway		
Pakistan	1957	1945
Peru*		
Phillippines		
Poland*		
Portugal	1940	1911

Romania		1947
Russia		1922
Serbia		1920
South Africa		
Spain	1869	1979
Sweden	2000	1881
Switzerland		
Thailand*		
Turkey		1928
UK*		
Uruguay		1918
USA		
Venezuela*		

*Denote countries with a state religion for the entire time period

Chapter 5: The effect of international development assistance on conflict. A fuzzy regression discontinuity approach.

5.1 Introduction

A voluminous literature analyzes the effect of foreign aid on the recipient economy (e.g., Easterly 2003, Rajan and Subramanian 2008, Djankov et al. 2008, Doucouliagos and Paldam 2008, for example, examine the effect of aid on growth, whereas, Burnside and Dollar 2000, Knack 2001, Bjørnskov 2010, Kono and Montinola 2013, Askarov and Doucouliagos 2015, examine the effect of aid on the institutional quality). In the present chapter, we examine the effect of aid, and more specifically of the World Bank's international development assistance (IDA), on domestic conflict in the recipient country. This issue has been examined in several other contributions (Collier and Hoeffler 2000, 2002; Crost et al. 2016; etc.) with contradicting findings. To our knowledge, however, this is the first chapter that uses the (ad hoc) GNI thresholds that the World Bank employs to distribute aid among recipient countries as an identification strategy.

Our focus on IDA has several methodological advantages. First, by only examining the effect of IDA receipts, we eliminate a potential bias steming from a possible correlation of the type of donor on the probability of conflict. Second, IDA is distributed according to a simple, exogenous to the recipient country, rule. Specifically, countries that are eligible for IDA must fall below a GNI threshold level which is defined by the World Bank, which is revised every year. Then, countries that have a GNI lower than the threshold two years before IDA allocations are made are eligible for aid. However, this is not the only condition for IDA allocation. According to the

World Bank, in addition, to receive IDA, a country must be considered not to be creditworthy for IBRD borrowing (Galiani et al. 2017). However, the latter condition is based on confidential reports by the World Bank. Hence, we use a fuzzy regression discontinuity design (*Fuzzy RDD*) so as to exploit both the GNI cutoff rule of the IDA program and deal with the problem facing some countries, in which, though they are below the threshold, they do not receive IDA as they are considered creditworthy.

By estimating a local *Fuzzy RDD*, we identify the effect of aid on conflict for countries which are just above and just below the cutoff. This allows us to examine the causal effect for countries that are similar, in general, but with the only difference being their eligibility for IDA.[43] *Fuzzy RDD* addresses the issue of endogeneity which plagues the standard fixed effects OLS regressions (Lee and Lemieux 2010). Moreover, in contrast to matching techniques (Austin 2011) it does not depend on the assumption of conditional independence and overlap, which are only satisfied within the limit of an *RDD* framework (Heckman et al. 1999).

The present chapter contributes to the literature in another dimension as well. In contrast to the existing literature (e.g., Berthélemy 2006; Findley et al. 2010; Wood and Sullivan 2015) that examines the effect of aid on major conflict events, such as civil wars and revolutions, we examine the effect of aid on both major and minor conflict events.[44] This strategy allows us to shed light on the underlying forces behind our main

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[43] We use a Fuzzy RDD since a simple OLS regression one would create several biases. First, reverse causality might be a problem as countries with high levels of conflict may also receive aid for conflict reduction. Second, aid recipient countries are less developed, and lower development is associated with higher incidence of conflict (Humphreys 2003).

[44] Using the Banks and Wilson (2017) database, we examine various types of conflict events, specifically, riots, anti-government demonstrations, strikes and government crises, revolutions, purges, terrorist attacks, and assassinations.

relationship. To further test our argument, we also exploit the *Fuzzy RDD* framework to examine the effect of IDA on coups and on autocratic regime change.

Overall, our findings show that IDA receipt leads to an increased level of conflict. Moreover, we provide evidence that the effect of aid on conflict depends on the type of conflict. We find that IDA leads to a decline in conflict events that are aimed at overthrowing the government (*anti-government demonstrations*, *terrorism*, *riots*, *strikes*) while it has a positive effect on conflict events that are aimed at overthrowing the political regime (*revolutions*, *assassinations* of political leaders). These results are consistent with several theoretical contributions in the aid-conflict nexus. Since aid creates a "winning the hearts and minds" effect, i.e., improved economic performance makes people more inclined to be friendly toward the government and thus conflict is reduced (Collier and Hoeffler 2002), we find a negative effect of aid on events that aim at overthrowing the government. Moreover, as aid creates rents for those that hold political power (Angeles and Neanidis 2009), we find a positive effect on conflict events aiming at changing the regime. Agents and groups that stand to gain from a change in the political regime, try to increase their political power without necessarily changing the government, so as to expropriate the aid revenues. Hence, there is overall a transfer of resources from types of conflict against the government to types of conflict against the political regime. These findings are also accompanied by results that indicate, using the same *Fuzzy RDD,* that there is an increase in coups and autocratic regime transitions.

In the following section we present the existing literature and provide our main theoretical argument. In section 5.3 we discuss our data and our empirical specification.

In section 5.4 we present our results while section 5.5 holds the robustness checks. Finally, section 5.6 concludes.

5.2 Theoretical considerations and testable hypotheses

A number of contributions have examined the effect of foreign aid on conflict, with contradicting findings. These findings vary depending on the sample used, the type of aid considered, and the empirical methodology employed. To explain these contradictory findings several theoretical arguments have been employed.

Starting from Grossman (1992) and Azam (1995), aid revenues are modeled as lootable resources, and the fungibility of aid flows make them attractive to opposing groups for extraction (i.e., governments and rebels). What they show is that although governments may seek to deter rebellion by giving a share of the revenues to rebels, deterrence does not always occur, as rebels might not like what the government is offering them, leading to an initiation of conflict. In a similar vein, Blattman and Miguel (2010), argue that there are some types of foreign aid flows that can be analogous to natural resources, thus governments and rebels want to capture them in order to finance their activities. This leads to an increased risk of civil war. Bó and Powell (2009), model the government and the opposition as competing over rents under uncertainty regarding the size of the spoils. They suggest that in bad times where a negative aid shock occurs, although that government may offer a part of the rents to the opposition, the opposition may feel "low-balled" and may prefer to engage in conflict. Narang (2015), provides evidence in favor of this view, by examining the effect of humanitarian aid using a

world data set for the period 1969–2008, as he finds that increased levels of aid extend the duration of civil wars.[45]

Against the "aid rents as lootable resources" argument comes the view that aid has an indirect effect on conflict by "winning the hearts and minds" of the population.[46] In a field experiment on the effects of the National Solidarity Program on insurgency in Afghanistan, Beath et al. (2012) show that aid leads to lower insurgency violence because people treat as a positive all government attempts to improve their well-being and are thus less likely to join the insurgency. Crost et al. (2016), in a study that examines the effect of a conditional cash transfer (CCT)[47] program on violent incidents in Philippines, show that the program increased popular support for the government. This, in turn, led to increased information sharing as well as cooperation between the government and the population regarding rebels' activities. Similar findings are presented in Dasgupta et al. (2007), which show that when the level of state capacity is high, anti-poverty programs lead to a reduction in violence. This happens because with high levels of state capacity, there is a lack of corruption and the program funds can

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[45] In the same paper it is argued that even humanitarian aid can have adverse effects by creating shelters for combatants. Similarly, Anderson (1999), Cooley and Ron (2002), and de Waal (2014) argue that refugee camps can help extremists and potential rebels by providing them with camouflage or serving as a point of recruitment. Wood and Molfino (2016) find that humanitarian aid leads to increased violence between government and rebels by performing a difference-in-differences estimation for 20 African countries. Their argument is that large amounts of aid create incentives for rebels to extend their control over larger areas. However, they find that other types of aid have no effect on conflict.

[4646] The term "hearts and minds" means that someone tries to bring a subjugated population over to their side by making emotional appeals to the supporters of the other side and was first used by Louis Hubert Gonzalve Lyautey, a French general and colonial administrator, as part of his strategy to counter the Black Flags rebellion along the Indochina-Chinese border in 1895 (Paret et al. 1986).

[47] Conditional cash transfer programs are those types of financial aid that aim to reduce poverty and individuals who are potential recipients of those programs must meet with some criteria.

more easily pass through to the local populations, which then makes people less willing to support an insurgency.[48]

The "winning the heart and minds" view, however, may create second order effects, which increase conflict. Higher aid flows may increase economic growth, thus increasing popular support for the government. Rebels are not comfortable with this support and, fearing they will lose their clout, they thus sabotage foreign aid programs. Weintraub (2016) examines the effect of a CCT program in Colombia, using a difference-in-differences approach, with 57 municipalities as treatments and 65 municipalities as controls. He finds that the program led to more killings and violent incidents. He suggests that this occurred as program beneficiaries cooperated with the government, and insurgents wanted to sabotage this cooperation. Similarly, Wood and Sullivan (2015), argue that aid will lead to an increased level of violence because it creates incentives for looting and also because it can be perceived by rebels as a challenge to their authority, which again leads to sabotage.

Sexton (2016), using a similar logic, finds that the type of aid as well as the recipient area, play a key role on its effect on conflict in Afghanistan. He finds that aid programs which aimed at reducing conflict (by boosting military power, for example) lead to an increased level of conflict in contested areas, i.e., areas that are not controlled by the government. On the other hand, aid does not appear to have an effect on areas

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[48] Against this view, Bradbury (2010), in a study for Kenya, argues that foreign aid does not win the "hearts and minds" of the population as they find that the level of security decreases three years after the receipt of aid. Since many people are skeptical regarding the presence of CJTF-HOA48 this would probably attract extremist violence.

under the control of the military. The explanation given is that rebels have an incentive to sabotage the foreign aid programs so as not to lose their power.[49,50]

Sollenberg (2012), in her empirical analysis for the period 1960–2004, finds that foreign aid increases the risk of conflict, conditional on the institutional environment of the recipient country. In a country with low levels of checks and balances, foreign aid inflows will lead to increased conflict due to rent-seeking activities. In contrast, she finds no effect when there is a high level of checks and balances. She also finds that there is a threshold effect of aid on conflict, implying that the positive effect of aid on conflict arises after a point of aid revenues is reached. She provides two possible explanations. First, the benefit of engaging in conflict has to overweigh the costs, which means that to engage in conflict the possible gains have to be higher than the losses. Second, as the literature suggests, aid dependency leads to increased rent-seeking behavior (see Economides et al. 2008), which can be translated to a rebellion.

Finally, examining a particular type of aid, democracy assistance programs for countries that were eligible during the period 1990–2003, Savun and Tirone (2011), find that, via democracy assistance programs, countries improve their governance by providing an external validation of commitments and promises made during the transition. They identify a causal effect by estimating an instrumental variables model,

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[49] Similarly(Ashley Jackson and Antonio Giustozzi 2012) in their report for Afghanistan, argue that aid resulted in higher conflict because the Taliban could not use humanitarian aid to their advantage.

[50] Several other arguments are proposed for why aid may reduce conflict. First, with aid revenues there is an increase in military expenditures, which makes a possible revolution less likely to occur (Collier and Hoeffler, 2007; (de Ree and Nillesen 2009)). Second, there is less dependence on primary commodity exports (Collier and Hoeffler, 2002). Last, the positive impact on growth makes a revolution more costly, by increasing the opportunity costs of conflict and the opportunity costs of recruiting rebels (Crost et al. 2016). However, all these arguments are, at least indirectly, related to the ones presented in the main text.

using two instrumental variables which are: a) the donor's GDP, and b) the level of the recipient country's affinity with the United States.

The above analysis reveals that aid can have a positive and a negative effect on conflict. As it is associated with an improvement of economic conditions and growth, it might increase the popular support for the government. On the other hand, having a large inflow of aid revenues creates incentives for those with political power to try to expropriate them. And this expropriation can only be achieved by a further increase in their political power.

Hence, aid might not have a homogeneous effect on all types of conflict. Domestic violence events that aim at the destabilization of the incumbent government (e.g., strikes or peaceful demonstrations) might be affected differently from conflict events that aim at changing the political regime (e.g., revolutions, coups, etc.). Support or distrust toward the government is typically associated with demonstrations, riots or even some terrorist events. In contrast, revolutions and coups aim at not only changing the government but also changing the rules of the political game, reshuffling political power and changing the underlying power structure within the polity. And even if one argues that polity transitions sometimes begin with mild conflict events, most of the time they rapidly escalate to violent attempts to overthrow the regime.

Thus, the winning the hearts and minds argument can be associated with changes in minor conflict events. If the economy performs well, typically it is attributed to the policies of the incumbent government. Hence, as distrust of the government falls, the general population will have no incentive to oppose the government and express their opposition with violent acts. In contrast, in cases where aid is a lootable resource,

those that hold political power can only increase their rents by changing the rules of the game, by excluding the general population as much as possible from the direct and indirect benefits of aid. This, of course, can only be achieved by changing the political regime, and thus in the latter case we should expect an increase in conflict events with that aim.

In the section that follows, we examine the effect of IDA on various types of conflict events so as to take into account this heterogeneity.

5.3 Data and Identification

The World Bank's international development assistance (IDA) was launched in September 1960 as an agency with the goal to provide "soft loans" to the poorest developing countries. According to the World Bank (2010), IDA has grown to include 173 shareholder member countries and has given loans to 76 of the poorest countries in the world. IDA takes the form of long maturity loans, with a maturity of around 40 years, a large grace period, and a very low and fixed interest rate.[51]

IDA eligibility among developing countries is based on two criteria, (i) relative poverty, defined as GNI per capita below an established threshold, and (ii) lack of creditworthiness to borrow on market terms. Until 1987 the threshold for relative poverty was set at the GNI per capital level of $250 in 1964 and was only adjusted for inflation, reaching $950 in 1987. However, as IDA resources were not adequate to permit funding all those countries below the threshold, a new operational cutoff was

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[51] As of July 2019, the interest rate was set at 1.46% for credits in USD. The maturity period was set at 40 years for small economies, 38 years for regular IDA countries, and 30 years for blend economies, i.e., creditworthy economies which are below the operational GNI cutoff, or standard IDA countries with a GNI above the operational cutoff for 2 consecutive years. Finally, the grace period was set at 10, 6 and 5 years for each of the 3 groups of eligible countries, respectively. See http://ida.worldbank.org/financing/ida-lending-terms for more details.

introduced in 1989. This threshold is adjusted annually, based on the availability of funds. In Figure 5.1, we plot the operational threshold from 1989, the year in which it was formally introduced, until 2020 (the latest World Bank fiscal year). Even though it exhibits an increasing trend over time, as more funds become available, there is significant variability over time.
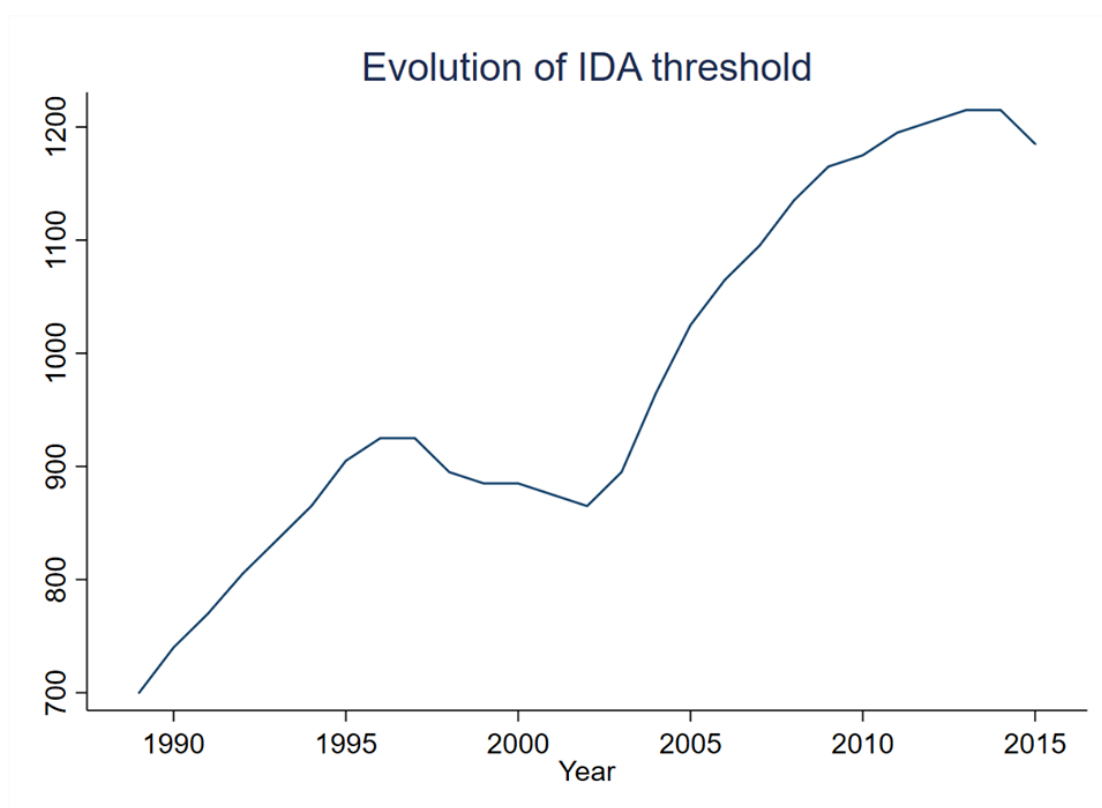
Figure 5.1:Evolution of IDA threshold: source: The World Bank Operational Manual : Operational Directive OD3.10 - IBRD/IDA Countries : Per Capita Incomes, Lending Eligibility, and Repayment Terms.

The rule of eligibility, however, is not deterministic. First, although data related to the relative poverty threshold are available from the World Bank's annual reports, the conditions for the creditworthiness criterion are not disclosed. The World Bank does not provide a specific formula for how countries are categorized as creditworthy, and

those reports are kept confidential (Moss and Majerowicz 2012). For this, there may be cases below the threshold that do not receive IDA, as they are classified as creditworthy and receive IBRD funding. Second, IDA replenishment periods cover intervals of three years (World Bank 2010). This implies that for a country to become ineligible there must be a period of three successive years over which its GNI is above the operational threshold. Thus, a country might be above the threshold for up to two consecutive years and still receive IDA. The latter two groups of countries are considered to be blend countries, and might be eligible for IDA funding, but under tougher terms. Finally, over time there have been some exceptions to the GNI per capita operational eligibility cutoff for some small island economies, which are considered to be vulnerable, to be exposed to the hard terms of IBRD borrowing.

Given the above considerations, to estimate the causal effect of international development assistance (IDA) on domestic conflict events, we use a fuzzy regression discontinuity design (Hahn et al. 2001).[52] The regression discontinuity approach is ideal in our setting, as the operational cutoff of the World Bank is set before each fiscal year. Moreover, the operational threshold of the World Bank is arbitrarily set, without following a specific, predetermined policy rule.[53] Furthermore, a fuzzy design is the correct approach as, following the discussion above, the treatment assignment is not a deterministic function of the running variable, i.e., the difference between GNI and the operational threshold of the World Bank. In other words, the randomness in the

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[52] For a general discussion of the regression discontinuity approach, see Lee and Lemieux (2010).

[53] Galiani et al. (2017) have tested the possibility of manipulating the IDA threshold. They performed a density test in order to test whether a brunching exists. Their argument is that if countries could manipulate the threshold, there would have been a significant brunching of observations just below the threshold, relative to those observations just above it. What they found was that, indeed, there was no evidence of brunching or thus threshold manipulation.

treatment assignment exists because there are countries below the threshold that do not receive IDA and countries above the threshold that do.

In this setting, *Fuzzy RDD* exploits the discontinuities in the probability in the assignment of treatment: countries that have a GNI just below the operational threshold see a jump in the probability of receiving IDA. Then, the discontinuity in the probability of treatment, when the GNI is below and above the operational threshold (i.e., the "running" variable), is an instrument for treatment status, and *Fuzzy RDD* uses a simple 2SLS estimation strategy (Hyytinen et al. 2018 ; Angrist and Pischke 2009).

To determine whether a country receives IDA, we used the annual IDA reports of the World Bank.[54] The same Bank reports give the operational threshold for each period.[55] Our running variable is constructed as $running_t = threshold_{t-2} - GNI_{i,t-2}$. We use two lags because the World Bank gives IDA in fiscal year t based on the GNI per capita on fiscal year $t-2$. Positive values of this variable imply eligibility for IDA at period t, and negative non-eligibility. For the GNI, we use GNI per capita under the Atlas method, which is the exact variable used by the World Bank to determine the relative poverty criterion. As Atlas conversion rates are updated regularly, we use the variable as reported in the World Development Indicators annual publications for each respective year.[56]

As *RDD*s are sensitive to the underlying functional form, we follow the standard practice (Becker et al. 2010; Potrafke and Rösel 2019) and estimate a local

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[54] These reports were provided directly to us and to date they are not available online.
[55] Galiani et al. (2017) also use the same reports for a more limited time period. For overlapping observations in our sample and the latter sample we confirmed that they are the same.
[56] RDD is sensitive to the measurement of the running variable, so we used the exact same variable that determines the rule. The annual publication of the World Development Indicators is available at https://openknowledge.worldbank.org/handle/10986/2124

nonparametric model as in Calonico et al. (2014) and Calonico et al. (2018). Furthermore, as (Hyytinen et al. 2018) show, we report mainly the results of robust and bias-corrected RDD, as most of the time they report estimations closer to the true treatment effect. To derive the optimal bandwidths, we follow Calonico et al. (2014) and Calonico et al. (2018). Finally, following Lee and Lemieux (2010) we also report the results of a parametric *RDD*.

The dependent variable is the various measures of conflict which are taken from the Banks and Wilson database (Banks and Wilson 2017). We examine the effect of IDA on all eight types of conflict that are reported in Banks and Wilson (2017). These events are: i) Peaceful public gatherings of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, *Antigovernment Demonstrations*; ii) Strikes of 1,000 or more industrial or service workers that involve more than one employer and that is aimed at national government policies, *General Strikes*; iii) Rapidly developing situations that threatens to bring the downfall of the present government, *Government Crises*; iv) Violent demonstrations or a clash of more than 100 citizens involving the use of physical force, *Riots*; v) Armed activities, sabotage or bombings carried out by independent bands of citizens or irregular forces and aimed at the overthrow of the government, *Terrorism*; vi) Systematic elimination by jailing or execution of political opposition within the ranks of the regime or the opposition, *Purges*; vii) Politically motivated murder or the attempted murder of a high government official or politician, *Assassinations*; vii) Illegal or forced changes in the top government elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central

government, *Revolutions*. Finally, Banks and Wilson (2017) construct a weighted average of all eight categories and construct a general conflict index.[57]

The conflict events reported in Banks and Wilson (2017) range from simple peaceful gatherings, i.e., *Antigovernment Demonstrations*, to major conflict events such as *Revolutions* and *Political Assassinations.* According to the above definitions we can conceive that *Revolutions, Purges*, and *Assassinations* are major conflict events within the country that aim at overthrowing the present political regime. In contrast, the rest of the conflict events documented are conflict events that are targeted against the incumbent government. Hence, according to the discussion in the previous section, we should expect that if aid increases conflict events against the regime it should bring an increase to *Revolutions, Purges*, and *Assassinations*. In contrast, if the IDA results in a "winning a hearts and minds" of the population, we should expect a positive treatment effect on the rest of the variables.

To ensure that our model is correctly specified, we first examine whether there are discontinuities at the threshold in other variables, which might imply a confoundedness of the results, and we then include these variables as controls. The controls that we use are, namely: GDP per capita, as according to Collier (2000), in countries where higher income people have higher opportunity costs of participating in conflict activities. Following Collier (2000), the degree of diversity affects conflict as "the more social ties there are within a rebel organization, the easier it will be to build a fighting force." Therefore, we use an index of ethnic, religious, and linguistic fractionalization. We also use the population growth since countries with a high

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[57] As the weights changed after 2007, for consistency, we have computed the variable after 2007 with the same weights as in pre-2007.

population are harder for the government to control.[58] We believe that the level of

democracy might also affect conflict, since less democratic countries are more prone to

experience higher levels of conflict (Hegre 2014). Finally, we use the total aid flows

that the country receives. Table 5-1 presents the descriptive statistics of the variables.

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[58] Moreover, the literature that examines the effect of the youth bulge on conflict (Huntington 2011), typically uses the population growth rate as a proxy for the growing share of the young age population. We also experimented with the share of young population (aged 15–24) as a dependent variable and our results remain qualitatively unchanged.

Table 5-1:Descriptive Statistics

Variable	Mean	St. Dev	Min	Max	Source	Definition
Antigovernment Demonstrations	0.908	4.12	0	149	Banks and Wilson (2016)	Peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority.
Strikes	0.128	0.624	0	13	Banks and Wilson (2016)	Strikes of 1,000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies,
Government Crises	0.125	0.39	0	5	Banks and Wilson (2016)	Rapidly developing situation that threatens to bring the downfall of the present government
Riots	0.454	1.71	0	28	Banks and Wilson (2016)	Violent demonstrations or clash of more than 100 citizens involving the use of physical force
Terrorism	0.637	7.68	0	363	Banks and Wilson (2016)	Armed activities, sabotage, or bombings carried on by independent bands of citizens or irregular forces and aimed at the overthrow of the government.
Purges	0.042	0.27	0	5	Banks and Wilson (2016)	Systematic elimination by jailing or execution of political opposition within the ranks of the regime or the opposition
Assassinations	0.160	0.85	0	26	Banks and Wilson (2016)	Politically motivated murder or attempted murder of a high government official or politician.
Revolutions	0.148	0.47	0	9	Banks and Wilson (2016)	Illegal or forced changes in the top government elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government.
General conflict index	1448.598	9895.669	0	455500	Banks and Wilson (2016)	Weighted average of all 8 categories
Coups	0.0005	0.022	0	1	Bjornskov and Rhode	Takes value 1 if a coup occurred and zero otherwise
IDA threshold	970	180	580	1215	World Bank reports	
Receipt of IDA	0.271	0.445	0	1	World Bank reports	Takes value 1 if a country receives IDA
GNI per capita	8466.696	14674.59	60	203900	World Bank reports	
Regime Transition	-1.67	15.82	-2	+3	Polity IV Project	Negative values denote a autocratic regime transition while positive a democratic one
GDP per capita	13093.94	15887.26	134	156144	Maddison	Gross Domestic Product per capita
Population growth	1.59	1.48	-6.184	16.33	World Bank	
Oil Rents	3.67	9.35	0	64.013	World Bank	Oil Rents
Fractionalization	0.44	0.18	0.0068726	0.8176585	Alesina	Mean of ethnic, religious and language fractionalization (own calculations)
Commitments of aid	1.766	5.56	0	24.8664	OECD	Total commitments of aid (all donors).

5.4 Results

To establish that the *RDD* is valid, we first provide a graphical representation of the jump of our measures of conflict at the threshold. Figure 5.2 shows that there is a positive jump of *Assassinations* and *Revolutions* at the threshold. There are negative jumps of *Antigovernment Demonstrations*, *Terrorism*, *Strikes*, and *Riots* in the *General Conflict Index*. Furthermore, we find a small effect on *Purges* and *Government Crises*. According to these graphs, a significant change at the threshold might exist.
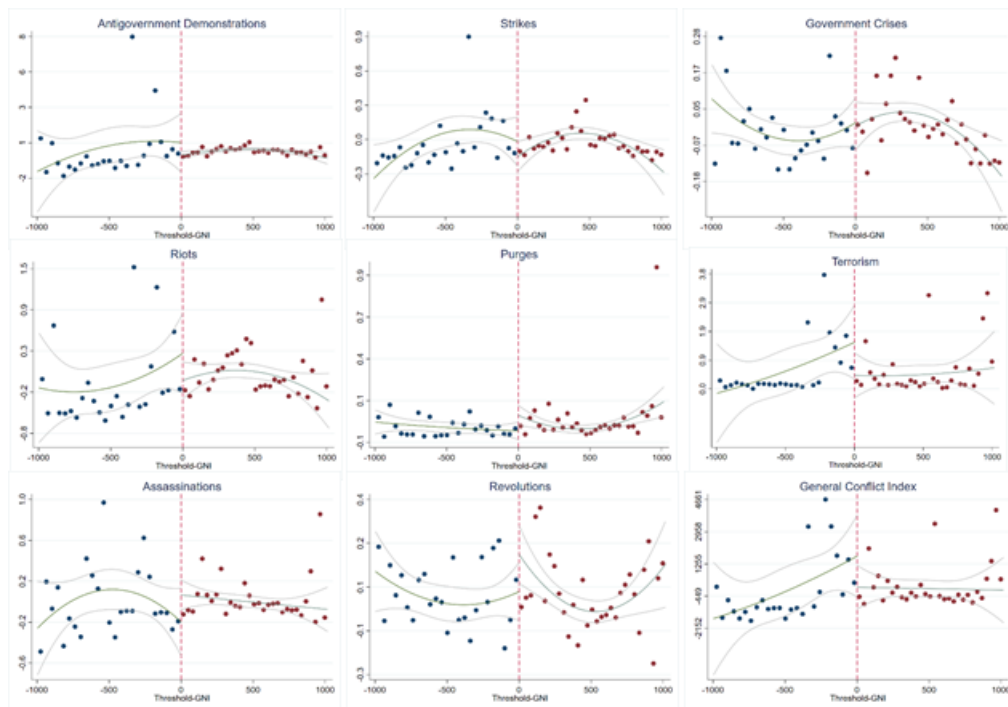

Figure 5.2: Jump of conflict variables at the threshold

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Panel A of Table 5-2 shows the baseline estimates of the *Fuzzy RDD* for the nine measures of conflict using three different measures of computing standard errors. We present estimations with conventional, robust, and bias corrected standard errors. Following Hyytinen et al. (2018) and Potrafke and Rösel (2019), even though we report the results for the conventional estimator, we only discuss the results of the robust and of the bias corrected estimator, which are typically considered the appropriate ones. In all columns we use covariates that affect domestic conflict and country and time fixed effects.[59]

As we proceed from column (1) to column (9) we present the effect of IDA from minor to major conflict events. As the reader can easily verify, the effect of IDA on conflict is negative when we examine minor conflict events and positive when we examine major ones. The results in column (9) suggest that the overall conflict decreases when a country receives IDA. This result is statistically significant at the 1-percent level, when we use the bias corrected estimator, and at the 5-percent level when we use the robust estimator. The estimated treatment effect is quantitatively significant, as it is equal to a two standard-deviation change in the dependent variable.

The results of the overall conflict index, however, do not give a clear picture of the effect of aid on conflict. As the rest of the columns in Table 5-2 show, there is a high degree of heterogeneity. The only variable that is statistically insignificant and can be considered as not affected by IDA is *Government Crises*. The results suggest that

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[59] A crucial assumption in RD approaches is that there are no discontinuities in other covariates across the threshold. Since those variables, according to the literature, affect conflict, we have also performed fuzzy regression discontinuity designs to examine whether they jump at the threshold. This means that the only variables that change discontinuously at the threshold are just the conflict measures and no other variables that affect conflict. In the appendix we present the estimations and the figures of these specifications (Table A5-1, Figure A5-1**Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.**).

IDA leads to a decline in *Antigovernment Demonstrations* (column 1), *General Strikes* (column 2), *Riots* (column 4), *Terrorism* (column 5), and *Purges* (column 7).[60] In contrast, we observe a positive effect of IDA on *Assassinations* (column 7) which is equivalent to a two standard-deviation increase and also in *Revolutions* (column 8) which is equivalent to a 1.5 standard-deviations increase.

Panel B reports the first-stage estimates. As the reader can easily verify, there is a positive relationship which implies that countries that cross the IDA threshold have a higher probability of receiving IDA, suggesting the validity of the instrument[61,62].

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[60] These results are quantitatively significant. The treatment effect on *Antigovernment demonstrations* is equivalent to a 1.5 standard-deviation decrease. Similarly, the corresponding magnitudes are approximately 1.12 1.5, 1.1 and 2 standard deviations for the *riots*, *purges*, *terrorism* and *strikes,* respectively.

[61] We should note that a simple correlation shows that approximately 60% of the cases that cross the GNI threshold receive IDA, which further indicates the validity of the instrument.

[62] Note that first-stage estimates differ across columns because the optimal bandwidth in each estimation differs.

Table 5-2:Baseline Results

Panel A: Second Stage	(1) Anti- Government Demonstrations	(2) General Strikes	(3) Government Crises	(4) Riots	(5) Terrorism	(6) Purges	(7) Assassinations	(8) Revolutions	(9) Weighted Conflict Index
Conventional	-4.512	-0.355	0.250	-0.698	-5.016	0.163*	1.327*	0.492	-5852.6
	(-1.46)	(-1.52)	(1.23)	(-0.95)	(-1.56)	(1.66)	(1.83)	(1.05)	(-1.49)
Bias-corrected	-6.670**	-1.029+	0.0107	-1.935***	-8.135**	0.374+	1.975***	0.943**	-10137.8***
	(-2.16)	(-4.39)	(0.05)	(-2.62)	(-2.53)	(3.81)	(2.73)	(2.01)	(-2.58)
Robust	-6.670*	-1.029+	0.0107	-1.935**	-8.135**	0.374***	1.975**	0.943*	-10137.8**
	(-1.77)	(-4.01)	(0.04)	(-2.29)	(-2.17)	(2.86)	(2.29)	(1.67)	(-2.18)
Panel B: First stage results									
Conventional	0.145***	0.300+	0.230+	0.254+	0.240+	0.258+	0.160**	0.194+	0.255+
	(2.58)	(6.77)	(4.66)	(5.38)	(4.95)	(5.52)	(2.50)	(3.72)	(5.45)
Bias-corrected	0.700	0.187+	0.122**	0.153+	0.156+	0.166***	0.09*	0.118**	0.155+
	(1.23)	(4.35)	(2.47)	(3.26)	(3.22)	(2.85)	(1.65)	(2.25)	(3.30)
Robust	0.700	0.187+	0.122*	0.153**	0.156**	0.166**	0.09	0.118*	0.155***
	(1.03)	(3.30)	(1.92)	(2.54)	(2.61)	(2.81)	(1.39)	(1.88)	(2.58)
Polynomial	1	1	1	1	1	1	1	1	1
Obs	3671	3671	3671	3671	3671	3671	3671	3671	3671
N_left	570	811	608	692	727	746	616	662	694
N_right	1265	1265	1265	1265	1265	1265	1265	1265	1265
Bwidth_Left	692.6	1411.3	957.5	1083.2	1004.4	1112.4	732.6	837.7	1095.6
Bwidth_Right	692.6	1411.3	957.5	1083.2	1004.4	1112.4	732.6	837.7	1095.6
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed and Time Effects	No	No	No	No	No	No	No	No	No

Note: Local polynomial regression discontinuity (RD) estimates running the optimal bandwidth procedure are reported (Calonico et al. 2014, 2018). Yearly observations and three different methods in computing standard errors apply to both panels. In Panel A, we present the second-stage results and in Panel B, the first-stage results. Covariates that are used are: population growth, GDP per capita, fractionalization, democracy index, oil rents, and total commitments of aid. Significance levels (t statistics in parentheses):+0.001, ***0.01, **0.05, *0.1.

Even though, at first sight, these results seem contradictive, there appears to be a clear pattern. First, minor conflict events like general strikes or peaceful demonstrations seem to decline after receiving IDA. In contrast, major events, especially those that might ultimately lead to a change in the political regime, like revolutions and purges of the opposition, appear to increase. So, it appears that there might be differences between conflict events directed against the political regime and events directed against the government. According to the results of the table, events that appear to have the aim of destabilizing the government (i.e., *Antigovernment Demonstrations, General Strikes*, *and Riots*) decline, while those that aim at changing the political regime increase (*Purges, Assassinations, and Revolutions*). These results, then, suggest that IDA "wins the hearts and minds" of the population, but at the same time gives incentives to politically powerful groups to create autocratic institutions to capture rents for themselves.

As a test of the above conjecture, in Table 5-3 and Figure 5.3 we also employ a *Fuzzy RDD,* but our dependent variables are i) the number of coups (taken from Bjørnskov and Rode 2019), and ii) the occurrence of an autocratic polity transition. According to the POLITY dataset, an autocratic polity transition occurs when there is at least a 3-point decline in the 20-point polity scale.[63] These results seem to confirm our explanation of our main findings. IDA appears to lead to an increased probability of a coup and to an increase in the probability of an autocratic transition.

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[63] Since coups is a binary variable with many zero values, the RDD graph has little meaning.

Table 5-3:Additional Fuzzy RD estimations

	(1) Regime Transition	(2) Coups
Conventional	-0.26	0.0255
	(-1.09)	(1.50)
Bias-corrected	-0.76***	0.0404**
	(-3.20)	(2.38)
Robust	-0.76**	0.0404
	(-2.68)	(1.51)
Polynomial	1	1
Obs	3639	4550
Bandwidth	1276.550	1680.323

Note: Local polynomial regression discontinuity (RD) estimates running the optimal bandwidth procedure are reported (Calonico et al. 2014, 2018). (t statistics in parentheses):+0.001, ***0.01, **0.05, *0.1.
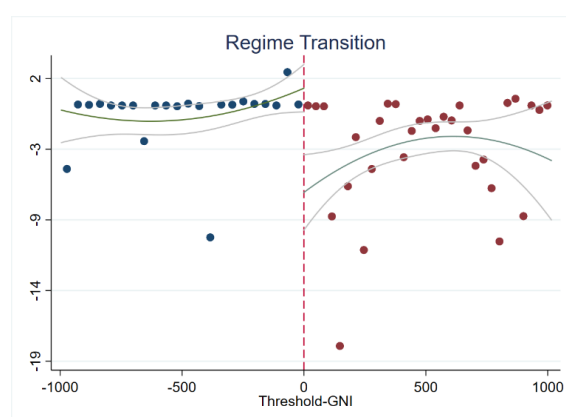

Figure 5.3:IDA on regime transition

5.5 Robustness

We perform various alternative estimations in order to test the robustness of our results. In Table 5-4, Panel A, we present the same estimations as in Table 5-2, however, this time excluding the covariates. The results are similar to our baseline model. The only difference is that the effect on *Antigovernment Demonstrations* and *General Strikes* appears to become statistically insignificant. In Panel B, we perform the same estimates as in Panel A but we include country and time fixed effects in order to control for specific country and time characteristics.[64] The signs and significance of the treatment effect for all conflict events remain the same as in our baseline specification, with the exception of *Purges* which loses statistical significance and now becomes only marginally statistically significant.

In panels C and D we examine the robustness of our results on the selection of the bandwidth. Therefore, we impose two ad hoc bandwidths of (+/-700 dollars) and (+/- 1,000 dollars) window, respectively, instead of relying on the optimal bandwidth selection. Overall, we find that the results remain similar to those in our baseline model. The *General Conflict Index* and the subindexes of *Revolutions, Terrorism,* and *Assassinations* are statistically significant when we use both the conventional and the bias-corrected estimator and their coefficients are similar to our baseline model. *Strikes* are not significant in Panel C, however, they regain significance in Panel D. We should note in most of the cases, variables lose significance since by restricting the window leads to a significant loss of observations.[65]

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[64] Since the Calonico and Cattaneo (2014) procedures do not allow for country and time fixed effects, we have double de-meaned the dependent variables.

[65] Jacob et al. (2012), suggest that there is a tradeoff between bias and precision. Using a large window, we get more precise estimates, since more data points are used.

Table 5-4: Robustness

	(1) Anti-Government Demonstrations	(2) General Strikes	(3) Government Crises	(4) Riots	(5) Terrorism	(6) Purges	(7) Assassinations	(8) Revolutions	(9) Weighted Conflict Index
					Panel A: No covariates				
Conventional	-0.0995	-0.649	0.0768	-1.043	-4.472*	0.117	1.174	0.554	-10008.8
	(-0.01)	(-0.66)	(0.40)	(-0.99)	(-1.79)	(0.83)	(1.50)	(1.42)	(-1.40)
Bias-corrected	4.998	-1.192	-0.241	-2.284**	-7.674***	0.290**	1.858**	0.867**	-16520.1**
	(0.47)	(-1.22)	(-1.25)	(-2.16)	(-3.07)	(2.05)	(2.37)	(2.22)	(-2.32)
Robust	4.998	-1.192	-0.241	-2.284*	-7.674**	0.290*	1.858**	0.867*	-16520.1*
	(0.38)	(-1.02)	(-0.97)	(-1.78)	(-2.46)	(1.75)	(1.96)	(1.76)	(-1.96)
Covariates	No	No	No	No	No	No	No	No	No
Country & Time Fixed Effects	No	No	No	No	No	No	No	No	No
					Panel B: Country & Time Fixed Effects				
Conventional	-3.065	-0.334	-0.316	-1.038	-4.528	0.0840	0.485	0.626**	-4959.4
	(-1.12)	(-1.51)	(-1.01)	(-1.47)	(-1.35)	(0.71)	(1.01)	(2.02)	(-1.31)
Bias-corrected	-2.491	-0.577***	-0.660**	-1.771**	-7.265**	0.200*	0.988**	0.912***	-7907.0**
	(-0.91)	(-2.62)	(-2.12)	(-2.52)	(-2.17)	(1.69)	(2.06)	(2.94)	(-2.09)
Robust	-2.491	-0.577**	-0.660*	-1.771**	-7.265*	0.200	0.988*	0.912**	-7907.0*
	(-0.75)	(-2.25)	(-1.75)	(-1.97)	(-1.81)	(1.40)	(1.67)	(2.31)	(-1.72)
Covariates	No	No	No	No	No	No	No	No	No
Country & Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
					Panel C: Window +-700				
Conventional	-4.521	-0.577	0.192	-1.849	-8.506	0.369*	1.453*	0.750	-10395.1
	(-1.50)	(-1.29)	(0.55)	(-1.30)	(-1.40)	(1.73)	(1.78)	(1.06)	(-1.33)
Bias-corrected	-3.479	-0.539	0.0794	-4.173***	-12.83**	0.701***	3.084+	1.323*	-15340.4*
	(-1.15)	(-1.20)	(0.23)	(-2.94)	(-2.12)	(3.29)	(3.77)	(1.87)	(-1.96)
Robust	-3.479	-0.539	0.0794	-4.173**	-12.83	0.701**	3.084***	1.323	-15340.4
	(-0.76)	(-0.86)	(0.16)	(-2.22)	(-1.57)	(2.55)	(2.89)	(1.30)	(-1.46)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Time Fixed Effects	No	No	No	No	No	No	No	No	No
					Panel D: Window +-1000				
Conventional	-4.074**	-0.442	0.260	-0.829	-5.035	0.190*	0.703*	0.363	-6390.7
	(-2.03)	(-1.63)	(1.35)	(-1.06)	(-1.56)	(1.78)	(1.73)	(1.06)	(-1.49)
Bias-corrected	-4.979**	-0.723***	0.117	-2.366***	-9.252***	0.409+	1.538+	0.781**	-11574.4***
	(-2.48)	(-2.67)	(0.60)	(-3.02)	(-2.86)	(3.83)	(3.78)	(2.27)	(-2.70)
Robust	-4.979**	-0.723**	0.117	-2.366**	-9.252**	0.409***	1.538+	0.781	-11574.4**
	(-2.09)	(-2.14)	(0.43)	(-2.39)	(-2.33)	(3.23)	(3.33)	(1.56)	(-2.20)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Time Fixed Effects	No	No	No	No	No	No	No	No	No

Table 5-4:Continued

	Panel E: Without countries that receive other types of aid								
Conventional	-4.535**	-0.308	0.321*	-0.476	-5.157	0.144	0.856*	0.385	-6048.0
	(-2.06)	(-1.32)	(1.92)	(-0.69)	(-1.62)	(1.40)	(1.78)	(1.20)	(-1.53)
Bias-corrected	-6.908***	-0.974+	0.105	-1.646**	-8.470***	0.374+	1.380***	0.751**	-10533.6***
	(-3.14)	(-4.18)	(0.63)	(-2.38)	(-2.66)	(3.64)	(2.88)	(2.33)	(-2.67)
Robust	-6.908***	-0.974+	0.105	-1.646**	-8.470**	0.374***	1.380**	0.751*	-10533.6**
	(-2.93)	(-3.84)	(0.51)	(-2.02)	(-2.20)	(2.63)	(2.34)	(1.75)	(-2.17)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Time Fixed Effects	No	No	No	No	No	No	No	No	No
	Panel F: Sharp RDD								
Conventional	-1.030*	-0.101	0.0755*	-0.147	-0.934	0.0353	0.181*	0.0852	-1151.8
	(-1.96)	(-1.49)	(1.77)	(-0.79)	(-1.44)	(1.43)	(1.90)	(1.22)	(-1.31)
Bias-corrected	-1.181**	-0.233+	-0.00339	-0.422**	-1.427**	0.0789***	0.236**	0.145**	-1816.4**
	(-2.25)	(-3.44)	(-0.08)	(-2.28)	(-2.20)	(3.20)	(2.47)	(2.08)	(-2.06)
Robust	-1.181***	-0.233***	-0.00339	-0.422**	-1.427*	0.0789**	0.236**	0.145	-1816.4
	(-2.60)	(-3.29)	(-0.06)	(-1.97)	(-1.72)	(2.45)	(2.06)	(1.45)	(-1.63)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & Time Fixed Effects	No	No	No	No	No	No	No	No	No
	Panel G: Replenishment Periods								
Conventional	-5.098	-0.451	0.101	0.0867	-2.705	-0.00920	0.0970	0.498	-6195.7
	(-1.49)	(-1.13)	(0.21)	(0.08)	(-0.98)	(-0.04)	(0.20)	(0.90)	(-1.27)
Bias-corrected	-7.629**	-1.081***	-0.170	-1.176	-6.064**	0.280	0.303	0.867	-12346.1**
	(-2.23)	(-2.70)	(-0.36)	(-1.13)	(-2.20)	(1.13)	(0.61)	(1.57)	(-2.54)
Robust	-7.629**	-1.081**	-0.170	-1.176	-6.064	0.280	0.303	0.867	-12346.1*
	(-2.12)	(-2.43)	(-0.30)	(-0.97)	(-1.59)	(0.90)	(0.45)	(1.15)	(-1.85)
Covariates	No	No	No	No	No	No	No	No	No
Country & Period Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Conventional	-4.535**	-0.308	0.321*	-0.476	-5.157	0.144	0.856*	0.385	-6048.0

Note: Local polynomial regression discontinuity (RD) estimates running the optimal bandwidth procedure are reported (Calonico et al.,2014, 2018). Yearly observations and three different methods in computing standard errors apply to both panels. In Panel A, we present the second-stage results and in Panel B the first-stage results. Covariates that are used are: population growth, GDP per capita, fractionalization, democracy index, oil rents, and total commitments of aid. Significance levels (t statistics in parentheses): +0.001, ***0.01, **0.05, *0.1.

In Panel E we exclude countries that receive other types of aid. In this way we exclude the possibility that it is not IDA that drives our results, but other sources of foreign aid. According to Moss and Majerowicz (2012), sometimes other donors also adopt the IDA threshold crossing as a signal of the recipient's need for economic assistance. Therefore, the jumps observed might be influenced by the aid provided by these countries. For that reason, we drop these countries from the sample in order to ensure that it is the IDA and not any other types of aid that are driving the results. Overall, in this scenario we do not observe any significant change in the main in our results.

In Panel F we perform a Sharp Regression Discontinuity approach. The Sharp Regression Discontinuity suggests a deterministic rule for IDA receipt (i.e., those cases that cross the IDA threshold will receive IDA). Interestingly all our main results remained unchanged.

In Panel F we perform a sharp regression discontinuity approach. The sharp regression discontinuity suggests a deterministic rule for IDA receipt (i.e., those cases that cross the IDA threshold will receive IDA). Even though the deterministic rule is not the appropriate modeling strategy in our case, it gives us insights on the validity of the *Fuzzy RDD*. Interestingly. all our main results remained unchanged.

As we noted in the previous section, for a country to graduate from IDA, there must be a period of three successive years during which its GNI is above the operational threshold. This means that the World Bank will decide to cut IDA funds only in the subsequent (3-year) replenishment period. During the years 1987–2016 which is the period under examination, the World Bank had 10 replenishment periods. In Panel G

we perform our baseline estimations, as in Table 5-2, using aggregate data across the (3-year) replenishment periods instead of annual observations for each country. Again, the overall index declines with IDA. We also find that the IDA has a negative effect on anti-government demonstrations when we use the robust and the bias-corrected estimator (column 2), as well as in *Terrorism* and *General Strikes*. *Revolutions* are statistically significant at the margin (a t-statistic of 1.57)*,* while *Riots* and *Assassinations* lose some of their statistical significance, yet the general result of the previous tables still remains.

Finally, in Table 5-5 and Table 5-6 we examine the robustness of our nonparametric *Fuzzy RDD* by performing parametric estimations. First, in Table 5-5 we estimate a global 2SLS model using the full sample of 170 countries.[66] Panel A reports the second-stage results while Panel B the first-stage results. Again, the results suggest that the overall *Conflict Index* decreases once a country receives IDA. Furthermore, *Antigovernment Demonstrations*, *Riots*, *Revolutions,* and *Terrorism* have the expected signs as before. However, we find no statistically significant effect on *Purges*, *General Strikes,* and *Assassinations*. Finally, in Table 5-6 we perform the same estimations as in Table 5-5 but we now use quadratic polynomial. The results are similar to those in Table 5-5.[67]

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[66] As already noted, bandwidth selection implies a tradeoff between precision and bias (Jacob et al. 2012). Thus, we use all the observations in order to estimate the causal effect of IDA on conflict.

[67] In the appendix we restrict the parametric RDD to a global model, which is restricted in the window of +/-1000 USD and +/-700 USD. The results are the same as the ones presented here.

Table 5-5: Global Regression Discontinuity Model

Panel A: Second Stage	(1) Anti-Government Demonstrations	(2) General Strikes	(3) Government Crises	(4) Riots	(5) Terrorism	(6) Purges	(7) Assassinations	(8) Revolutions	(9) Weighted Conflict Index
Treatment Effect	-6.454**	-0.345	-0.072	-1.699**	-6.409**	0.022	0.224	0.345**	-8697.877**
	(-2.167)	(-1.215)	(-0.561)	(-2.231)	(-2.131)	(0.242)	(0.976)	(2.312)	(-2.204)
Forcing	-0.001***	-0.000**	-0.001***	-0.001*	0.000***	0.001***	-0.000**	-0.001***	0.033*
	(-2.710)	(-2.422)	(-2.914)	(-1.679)	(2.863)	(4.302)	(-2.009)	(-5.554)	(1.826)
Observations	4537	4537	4537	4537	4537	4537	4537	4537	4537
r2	-0.0624	0.00823	0.0179	0.0623	-0.0216	0.0512	0.0173	-0.0139	-0.0187
F	4.383	4.094	2.994	7.467	1.312	4.135	3.448	6.555	2.269

First stage results:

1 if eligible 0.200***
(6.906)
Forcing -0.001**
(-2.202)
First stage F
47.67

Note: Global polynomial regression discontinuity (RD) estimates using time and country fixed effects. Significance levels (t statistics in parentheses): ***0.01, **0.05, *0.10.

Table 5-6:Global Regression Discontinuity Model, Polynomial 2

	(1) Anti-Government Demonstrations	(2) General Strikes	(3) Government Crises	(4) Riots	(5) Terrorism	(6) Purges	(7) Assassinations	(8) Revolutions	(9) Weighted Conflict Index
IDA recipient	-6.548**	-0.356	-0.074	-1.733**	-6.400**	0.022	0.226	0.340**	-8720.045**
	(-2.194)	(-1.251)	(-0.575)	(-2.268)	(-2.126)	(0.240)	(0.977)	(2.271)	(-2.207)
forcing	-0.000***	-0.000***	-0.000**	-0.000***	0.000*	0.000**	-0.000	-0.000***	0.022
	(-4.141)	(-2.880)	(-2.323)	(-3.171)	(1.923)	(2.203)	(-0.806)	(-4.553)	(0.705)
Forcing x forcing	-0.000***	-0.000***	-0.000	-0.000***	0.000	-0.000	0.000	-0.000***	-0.000
	(-3.997)	(-2.748)	(-1.235)	(-3.366)	(0.412)	(-0.040)	(0.483)	(-2.991)	(-0.674)
Observations	4537	4537	4537	4537	4537	4537	4537	4537	4537
r2	-0.0656	0.00789	0.0178	0.0610	-0.0214	0.0512	0.0172	-0.0115	-0.0190
F	4.523	3.995	2.888	7.171	1.282	3.998	3.346	6.348	2.224

First Stage Results

1 if eligible	0.200***
	(6.873)
Forcing	-0.001***
	(-2.849)
Forcing squared	-0.001***
	(-2.713)

First stage F
47.21

Note: Global polynomial regression discontinuity (RD) estimates using time and country fixed effects. Significance levels (t statistics in parentheses): +0.001, **0.01, **0.05, *0.10.

5.6 Conclusion

In this chapter we tried to examine the causal effect of receiving international development assistance by the World Bank on domestic conflict events. We exploited the operational threshold used to assess the relative poverty criterion for Gross National Income, as set annually by the World Bank, in *Fuzzy RDD*. According to our findings, the effect of IDA on conflict is not the same across various conflict types. Specifically, we found that IDA increases conflict events that aim at changing the political regime, whereas it has a negative effect on conflict events that aim at overthrowing the government.

These results suggest that individuals might transfer resources from the latter events to the former ones. In this way, individuals that hold political power within the country may loot the aid revenues, despite the fact that the government has won the political support of the population. Our argument is supported by additional *Fuzzy RDD* estimations in which we find that IDA increases coups as well as leading to autocratic regime change. Our results are robust across alternative specifications.

These results are significant from a policy perspective as they allow us to understand the changes in the political arena within the country, due to the development policies. Even though these policies might be quite effective, and may yield a positive short-run effect in terms of improving both economic and political conditions, in the long run they might well be quite detrimental. By creating rents within the economy, they might spur a process of internal conflicts with the aim of creating an extractive and authoritarian regime. And, ultimately, unless foreign aid conditions are properly

structured, this long-run effect might be adverse enough to nullify all the positive short-run effects of aid on the economy.

Appendix

Table A5-1: Fuzzy RD estimations on covariates

	(1) Population growth	(2) Oil rents	(3) Real GDP per Capita	(4) Fractionalization	(5) Level of Democracy	(6) Commitments
Conventional	-2.839	0.730	-1087.6	-0.0364	0.214	10.42**
	(-1.08)	(0.20)	(-0.72)	(-0.35)	(0.08)	(2.36)
Bias-corrected	-4.077	-3.160	-719.9	0.0320	3.284	16.97+
	(-1.55)	(-0.85)	(-0.48)	(0.31)	(1.17)	(3.84)
Robust	-4.077	-3.160	-719.9	0.0320	3.284	16.97***
	(-1.35)	(-0.69)	(-0.42)	(0.25)	(1.02)	(3.04)
Polynomial	1	1	1	1	1	1
Obs	4507	4370	3959	4410	3959	4566
N_total_left	3067	2960	2634	3024	2562	3121
N_total_right	1440	1410	1325	1386	1397	1445
N_left	703	877	774	917	744	858
N_right	1440	1410	1325	1386	1397	1445
Bwidth_Left	600.5	1110.7	872.5	966.6	699.1	857.8
Bwidth_Right	600.5	1110.7	872.5	966.6	699.1	857.8
Bandwidth Covariates	mserd	mserd	mserd	mserd	mserd	mserd
Kernel	Triangular	Triangular	Triangular	Triangular	Triangular	Triangular

Table A5-2: Parametric Regression Discontinuity Model with restricted window I

|	() Anti-Government Demonstrations	(2) General Strikes	(3) Government Crises	(4) Riots	(5) Terrorism	(6) Purges	(7) Assassinations	(8) Revolutions	(9) Weighted Conflict Index
Panel A (+-1000 window)									
1 if recipient	-9.488*	-0.340	0.021	-1.228	-9.569*	0.493	0.138	1.144*	-1.16e+04
	(-1.707)	(-0.583)	(0.062)	(-0.773)	(-1.658)	(1.607)	(0.156)	(1.903)	(-1.558)
Forcing	-0.001	-0.001	-0.001	-0.001	0.001	-0.001	0.001	-0.001*	0.301
	(-1.206)	(-1.267)	(-0.671)	(-1.408)	(0.763)	(-0.702)	(0.986)	(-1.751)	(0.299)
Observations	2069	2069	2069	2069	2069	2069	2069	2069	2069
r2	-0.363	0.0164	0.0200	0.0443	-0.530	-0.308	0.0247	-0.627	-0.393
F	0.478	1.963	1.535	2.434	0.776	1.599	2.080	1.868	0.991
				First stage results					
				1 if eligible 0.114***					
				(2.866)					
				Forcing 0.001					
				(0.173)					
estat									
idstat	8.125	8.125	8.125	8.125	8.125	8.125	8.125	8.125	8.125
widstat	8.214	8.214	8.214	8.214	8.214	8.214	8.214	8.214	8.214
Panel B (+-700 window)									
1 if recepient	-6.649*	-0.187	-0.230	-0.879	-10.036**	0.394	0.370	1.180**	-1.18e+04*
	(-1.775)	(-0.425)	(-0.779)	(-0.734)	(-2.058)	(1.622)	(0.720)	(2.035)	(-1.904)
Forcing	-0.001*	-0.001	0.001	-0.001**	0.001	-0.001	0.001	-0.001	0.816
	(-1.744)	(-0.710)	(0.857)	(-2.182)	(0.797)	(-0.708)	(0.638)	(-1.624)	(0.453)
Observations	1702	1702	1702	1702	1702	1702	1702	1702	1702
r2	-0.0805	0.0526	-0.0131	0.0798	-0.515	-0.199	0.00491	-0.605	-0.356
F	0.558	1.824	1.861	2.184	0.644	1.317	1.911	1.626	0.896
				First stage results					
				1 if eligible 0.144***					
				(3.370)					
				Forcing -0.001					
				(-0.544)					
				First Stage F					
				11.36					

Note: Parametric regression discontinuity (RD) estimates using time and country fixed effects. Polynomial order 1. Significance levels (t statistics in parentheses): +0.001,***0.01, **0.05, *0.10.

Table A5-3: Parametric Regression Discontinuity Model with restricted window II

	(1) Anti-Government Demonstrations	(2) General Strikes	(3) Government Crises	(4) Riots	(5) Terrorism	(6) Purges	(7) Assassinations	(8) Revolutions	(9) Weighted Conflict Index
Panel A (+-1000 window)									
1 if recipient	-9.383*	-0.308	0.021	-1.197	-9.348*	0.494	0.125	-0.251	-1.13e+04
	(-1.695)	(-0.524)	(0.062)	(-0.757)	(-1.64)	(1.590)	(0.145)	(-0.898)	(-1.531)
Forcing	-0.001	-0.000	-0.000	-0.000	0.000	-0.000	0.000	0.000	0.087
	(-1.285)	(-1.515)	(-0.664)	(-1.569)	(0.542)	(-0.679)	(1.109)	(1.045)	(0.081)
Forcing squared	-0.001	-0.001**	0.001	-0.001	-0.001	-0.001	0.001	-0.001	-0.002
	(-0.748)	(-1.980)	(0.013)	(-0.531)	(-1.300)	(-0.100)	(0.371)	(-0.515)	(-1.542)
Observations	2069	2069	2069	2069	2069	2069	2069	1702	2069
r2	-0.352	0.0240	0.0200	0.0477	-0.501	-0.310	0.0254	-0.0221	-0.365
F	0.469	1.932	1.497	2.374	0.762	1.552	2.016	1.811	0.977
First stage results									
1 if eligible					0.114***				
					(2.851)				
Forcing					0.001				
					(0.202)				
Forcing squared					0.001				
					(0.242)				
idstat	8.046	8.046	8.046	8.046	8.046	8.046	8.046	8.046	8.046
widstat	8.126	8.126	8.126	8.126	8.126	8.126	8.126	8.126	8.126
Panel B (+-700 window)									
1 if recipient	-6.492*	-0.243	-0.251	-1.064	-9.733**	-0.251	0.287	0.952**	-1.19e+04**
	(-1.912)	(-0.612)	(-0.898)	(-0.963)	(-2.138)	(-0.898)	(0.580)	(2.020)	(-2.024)
Forcing	-0.002*	-0.000	0.000	-0.000**	0.001	0.000	0.000	-0.000	0.823
	(-1.760)	(-0.535)	(1.045)	(-2.056)	(0.845)	(1.045)	(0.812)	(-1.493)	(0.514)
Forcing squared	0.001	-0.001	-0.001	-0.001	0.001	-0.001	-0.001	-0.001**	-0.001
	(0.283)	(-0.664)	(-0.515)	(-0.951)	(0.366)	(-0.515)	(-0.882)	(-2.117)	(-0.023)
Observations	1702	1702	1702	1702	1702	1702	1702	1702	1702
r2	-0.0718	0.0479	-0.0221	0.0668	-0.481	-0.0221	0.0165	-0.369	-0.357
F	0.569	1.773	1.811	2.083	0.632	1.811	1.900	1.937	0.875
First stage results									
1 if eligible					0.154***				
					(3.596)				
Forcing					-0.001				
					(-0.825)				
Forcing squared					0.001				
					(1.338)				
First Stage F					8.21				

Note: Parametric regression discontinuity (RD) estimates using time and country fixed effects. Polynomial order 2. Significance levels (t statistics in parentheses): +0.001, ***0.01, **0.05, *0.10.

Figure A5-1:Jump on the covariates
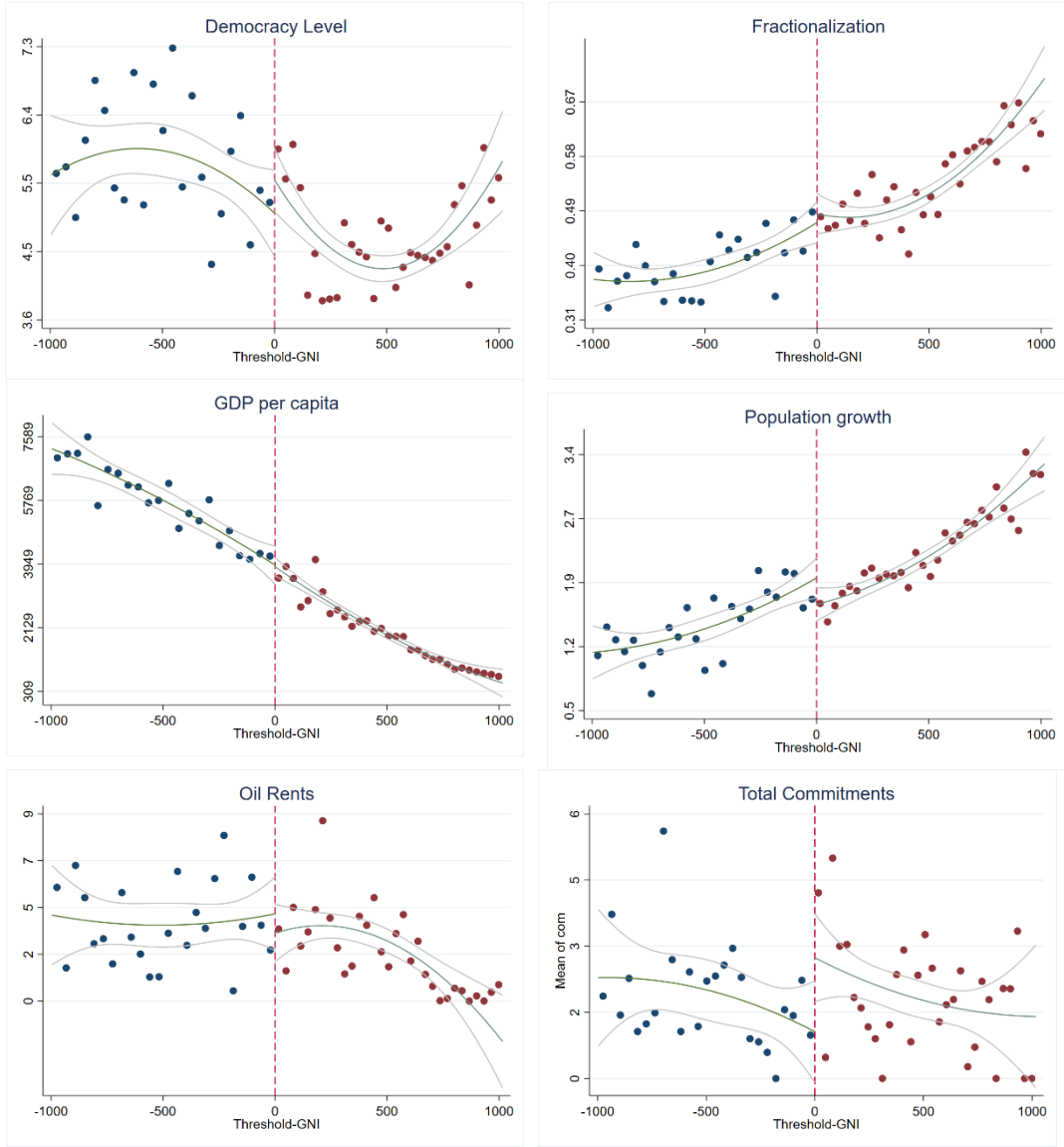
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