

Université de Montréal

Essays in political economy

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Hector Galindo Silva

Département de sciences économiques

Faculté des arts et sciences

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présentée par :
Hector Galindo Silva

a été évaluée par un jury composé des personnes suivantes :

Rui Castro,	président-rapporteur
Alessandro Riboni,	directeur de recherche
Raphael Godefroy,	directeur de recherche
Rohan Dutta,	membre du jury
Ruben Durante,	examineur externe
Brahim Boudarbat,	vice-doyen, représentant du doyen de la FAS

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Résumé

Cette thèse relie trois articles sur l'économie politique. Ces articles analysent à la fois théoriquement et empiriquement si, et dans quelle mesure, trois phénomènes politiques différents (les partis politiques, les guerres civiles et les menaces externes), et leur interaction, influent sur les résultats économiques.

Le premier chapitre étudie l'impact de la présence au pouvoir des politiciens de nouveaux partis politiques sur la taille du gouvernement. Le chapitre se concentre sur les municipalités colombiennes, où les nouveaux partis politiques ont été nombreux et fructueux au cours des dernières années. Les estimations par régressions sur discontinuité montrent que les dépenses publiques et les recettes fiscales sont significativement plus élevées dans les municipalités gouvernées par un maire d'un nouveau parti politique. En utilisant des informations sur la politique locale et des caractéristiques des nouveaux partis, je soutiens que ce résultat peut être expliqué par le fait qu'il y a moins d'information sur les politiciens de nouveaux partis que les politiciens des partis traditionnels.

Le deuxième chapitre développe une nouvelle explication de l'impact des guerres civiles et des conflits interétatiques sur le *state-building* qui repose sur l'idée que les protagonistes de ces deux types de conflits peuvent avoir un lien (ethnique ou idéologique). Un premier résultat montre que la force de ce lien

détermine si les conflits contre des adversaires internes (i.e. guerres civiles) ou des ennemis externes (i.e. conflits interétatiques) sont complémentaires ou se substituent, conduisant à plus ou moins d'investissement en capacité fiscale. La théorie prédit également un rôle non trivial de la stabilité politique dans la relation entre les deux types de conflits et la capacité fiscale : un deuxième résultat montre que, bien que la stabilité politique se traduit par moins de capacité fiscale, plus de stabilité n'implique pas plus de state-building. Leur équivalence dépend du niveau de cohésion des institutions. Un nouveau mécanisme par lequel plus de stabilité politique peut impliquer moins de state-building est proposé. En outre, il est démontré que des corrélations dans les données cross-country sont compatibles avec la théorie.

Le troisième chapitre examine la relation entre la probabilité d'occurrence d'un conflit intérieur violent et le risque qu'un tel conflit "s'externalise" (c'est à dire se propage dans un autre pays en devenant un conflit interétatique). Je considère une situation dans laquelle un conflit interne entre un gouvernement et un groupe rebelle peut s'externaliser. Je montre que le risque d'externalisation augmente la probabilité d'un accord de paix, mais seulement si le gouvernement est suffisamment puissant par rapport aux rebelles, et si le risque d'externalisation est suffisamment élevé. Je montre comment ce modèle aide à comprendre les récents pourparlers de paix entre le gouvernement colombien et le groupe le plus puissant des rebelles dans le pays, les FARC.

Mots-clés : nouveaux partis politiques, taille du gouvernement, gouvernements locaux, capacité fiscale, stabilité politique, conflit interétatique, guerre civile, externalisation, pourparlers de paix

Abstract

This dissertation ties together three papers on political economy. These papers explore both theoretically and empirically whether, and to what extent, three different political phenomena (political parties, civil wars and external threats), and their interaction, affect economic outcomes.

The first chapter investigates the impact of the presence in power of politicians from new parties on the size of government. The chapter focuses on Colombian municipalities, where new parties have been numerous and successful in recent years. Regression discontinuity estimates show that public spending and tax revenue are significantly higher in municipalities governed by a mayor from a new party. Using information about local politics and the features of the new parties, as well as a model of political incumbency, I argue that this result can be explained by the fact that there is less information on politicians from new parties than on politicians from traditional parties.

The second chapter develops an novel explanation of the impact of both civil war and interstate disputes on state building based on the idea that the protagonists of these two types of conflicts might have an link (ethnic or ideological). A first result shows that the strength of this link determines whether conflicts fought against internal adversaries (i.e. civil wars) or external enemies (i.e. interstate disputes) complement or substitute each other, leading to larger or smaller investments in fiscal capacity. The theory also predicts a

non trivial role of political stability in channelling the relation between both kinds of conflicts and fiscal capacity : a second result shows that while less political stability translates into less fiscal capacity, more stability does not automatically imply more state building. Whether or not they are equivalent depends on how cohesive institutions are. A novel mechanism through which more political stability might imply less state building is proposed. Additionally, it is shown that some correlations in cross-country data are consistent with the theory.

The third chapter investigates the relationship between the likelihood of a violent domestic conflict and the risk that such a conflict “externalizes” (i.e. spreads to another country by becoming an international dispute). I consider a situation in which a domestic conflict between a government and a rebel group externalizes. I show that the risk of externalization increases the likelihood of a peaceful outcome, but only if the government is sufficiently powerful relative to the rebels, and if the risk of externalization is sufficiently high. I show how this model helps to understand recent intriguing peace talks between the Colombian government and the most powerful rebel group in the country, the FARC.

Keywords : New parties, size of government, local governments, fiscal capacity, political stability, interstate conflicts, civil war, externalization, peace talks

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Liste des abréviations

RDD Regression Discontinuity Design

GDP Gross Domestic Product

CPI Consumer Price Index

DNP Departamento Nacional de Planeacion

DANE Departamento Administrativo Nacional de Estadística

MTI Municipal Transparency Index

COW Correlates of War project

UCDP Uppsala Conflict Data Program

IMF International Monetary Fund

DRC Democratic Republic of Congo

MID Militarized Interstate Dispute

CINC Composite Index of National Capability

FARC Revolutionary Armed Forces of Colombia

OAS Organization of American States

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Chapitre 1

New parties and policy outcomes : theory and evidence from Colombian local governments¹

1.1 Introduction

During the last two decades in both developing and established democracies, new political parties have increased in popularity and power.² These parties differ along many dimensions, such as their degree of personalism and their ideological views. However, what is common is their lack (or absence) of experience in government. If this lack of experience implies, as some authors have argued (see for example Grynaviski, 2006, 2010, Aldrich and Gryna-

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2. For a detailed discussion of the recent rise in importance of non-traditional parties, see Meguid (2008) for Western Europe, Tavits (2007) for Eastern Europe, and Bejarano, Mainwaring, and Pizarro (2006) for Latin America.

viski, 2010), that voters have less information about the members of these parties, and if this information allows citizens to hold politicians accountable (see Fiorina, 1980, Cox and McCubbins, 2005, Besley, 2006, Aldrich, 2011), then one would expect new parties to have an effect on policy outcomes.

In this chapter I study the impact of the presence in power of politicians from new parties on the size of government and other policy outcomes. In spite of its relevance, to my knowledge this question has not yet been addressed in the empirical literature. Since in many countries increasing political competition has brought new parties into the political arena, understanding the policy consequences of new parties might improve the understanding of the effect of increasing political competition (see Lizzeri and Persico, 2005, Acemoglu and Robinson, 2006, Besley, Persson, and Sturm, 2005, 2010).

The study focuses on Colombian local governments, where the presence in power of new parties has been strong in recent years. The Colombian case is attractive because of the quantity, heterogeneity and success of these parties and, most importantly, because new parties are particularly easy to identify. These parties are essentially political movements created within months of an election and without any experience in power in the municipalities and period studied. The opponents of these new movements are two very old political parties : the Colombian Liberal Party (left-wing) and Colombian Conservative Party (right-wing). These two parties, which were founded in 1848 and 1849 respectively, have split the bulk of power in power in every municipality for more than a century. Only recently, partly as a result of new laws favouring political competition, have these two traditional parties started to lose significant power (around the 41% of all local elections).

This study begins by proposing a theoretical framework based on a career-concern model. The main prediction of the model is that when a government is led by a politician from a new party, the size of government (spending

and taxes) is higher. The argument is the following. Once in office, and irrespectively of his political party, a politician concerned about his career faces the following trade-off : on the one hand, a bigger government allows for the extraction of larger political rents, but on the other hand, it will be interpreted by voters as a indication of dishonesty, decreasing his chances of future reappointment and future political rents. In the solution of this trade-off, the ex-ante uncertainty about the politician's honesty is crucial : more uncertainty means that the actions of the politician are less informative. As a result, increasing the size of government has a smaller electoral cost. Since we expect that the uncertainty about the honesty of politicians belonging to a new party will be higher, my model implies that relative to a politician from an old party, a politician from a new party will choose higher levels of spending and taxes when he is in power.

This model is consistent with the qualitative literature on the role of political parties in Colombian local governments and with the empirical findings from the second part of the chapter. This evidence consists of a comparison of fiscal outcomes in municipalities with governments controlled by new parties and municipalities with governments controlled by old parties from 1997 to 2011. New parties are defined as parties that had never won an election in a municipality, while the Liberals and Conservatives are defined as the old parties. To isolate the causal impact of governments on new parties, I employ a regression discontinuity (RD) design that compares municipalities where candidates from new parties barely won an election to municipalities where candidates from new parties barely lost. The RD estimates show that public spending is significantly higher in municipalities where a mayor from a new party is in power, and that this difference is due to a corresponding difference in local taxes, for which local authorities are directly responsible. In addition, analysis using information on local politics and on the characteristics

of new parties suggest that it is a party's newness that plausibly explains the difference. More specifically, in order to capture the degree of knowledge that voters have about the parties, I compute the number of years that have passed since the party's first participation in an election. I find that the effect of a new party on spending is larger for parties that have never participated in any municipal election and decreases with the party's age.

To shed further light on the plausibility of my explanation, I also consider other mechanisms that could explain why new parties spend more. First, I examine whether the ideology of new parties is a factor explaining why they spend more. I find that the size of government is larger in municipalities governed by new parties, regardless of whether the opposition party is left-wing (Liberal). Second, I examine the possibility that new parties spend more because they have a smaller majority on a municipal council. I find the same results regardless of whether the winner holds a majority on the local council. Finally, using measures of transparency at municipal levels, I find that local governments led by new parties do not take more measure in order to improve the transparency of their actions than those led by old parties.

This study contributes to an increasing literature that empirically examines the role of partisan affiliation in determining policy outcomes. Several studies have examined this question at either state or national levels. For example, Besley and Case (2003) use a fixed effects framework to show that, for U.S. state legislatures, a higher fraction of Democrat party seats is associated with significantly higher state spending. Lee, Moretti, and Butler (2004) use a regression discontinuity design and find that partisan affiliation explains a very large proportion of the variation in the U.S. congressional voting behavior. At the municipal level, the evidence is inconclusive : while Pettersson-Lidbom (2008) finds that marginally elected left-wing local governments impose significantly higher taxes and spend more than their

right-wing counterparts in Sweden, for the U.S. Ferreira and Gyourko (2009) fail to find any differences in the size of government under marginally elected Democrat and Republican mayors. None of these papers analyze the impact of new or inexperienced political parties on policy outcomes.

Since new parties can be characterized as weak party organizations, this study is also related to Primo and Snyder (2010) in examining the link between party strength and public finance outcomes. Although Primo and Snyder focus on a different level of governance (U.S. states) and use a different methodology (difference-in-differences estimation), I also find that weak parties increase the size of government. My argument is, however, different : in their model, a party is weak if its internal structure and role in candidate nominations is not well defined. In my model, a weak party is a political organization whose label is not very informative. My argument is therefore close to the literature on party labels as “brand names” (Snyder and Ting, 2002; Grynaviski, 2006, 2010). In particular, it is consistent with the finding that less informative party labels lead to more extreme policy outcomes (Snyder and Ting, 2002). However, in contrast with Snyder and Ting (2002), and consistent with Grynaviski (2006, 2010), I argue that the informational value of party labels mostly depends on a party’s past behavior in office, as opposed to the capacity of the parties to restrict access to their label. However, none of these papers discuss new parties. Additionally, they all propose general spatial models of party competition, whereas I use a political career-concerns framework (Holmstrom, 1999, Dewatripont, Jewitt, and Tirole, 1999, Persson and Tabellini, 2000).

This study is also related to the literature of multiparty competition with free entry. Palfrey (1984), Osborne (2000) and Callander (2005) propose spatial models of electoral competition where two dominant parties, competing simultaneously with each other, face the possibility that third parties enter

the competition after they have chosen their policy positions. They are all interested in the equilibrium policy outcomes. In particular, they find that when third parties enter and win, the policies that they choose are either moderate (Osborne) or extreme (Callander). In all these models the third parties can be interpreted as new parties relative to the established two-party system ; however, since the voters have the same information about all the parties, their notion of third party is fundamentally different than mine.

Finally, as previously noted, this study contributes to the literature on the impact of political competition on policy outcomes (Lizzeri and Persico, 2005, Acemoglu and Robinson, 2006, Besley, Persson, and Sturm, 2005, 2010). Lizzeri and Persico (2005) find that a high degree of political competition (defined as the number of parties participating in an electoral competition) may reduce welfare by channelling resources into targeted transfers rather than general-interest public goods. Acemoglu and Robinson (2006) model political competition as the inverse of the expected cost of replacement of the incumbent, and find that political competition affects no monotonically institutional development by intensifying political instability and affecting the incentive for incumbents to implement growth-enhancing reforms. Besley, Persson, and Sturm (2005, 2010) measure political competition by the dominance of U.S. Republicans or Democrats, and find that higher political competition is associated with more pro-growth policies ; they also test this prediction using panel data for U.S. states. Since a high degree of political competition (whatever the definition of political competition is) makes it more likely that new parties will compete and win, this study contributes to the literature by proposing a new drawback to political competition : new parties are less known to voters, which may cause an overprovision of public goods when they are in power by allowing these governments to extract large political rents without being punished in subsequent elections.

The outline of the chapter is as follows. Section 1.2 describes the career-concern model of political-incumbent policy choice. Section 1.3 describes the political and economical context of Colombian local governments. Section 1.4 discusses the data and empirical strategy. Section 1.5 presents the empirical results. Section 1.6 concludes.

1.2 Theoretical Framework

1.2.1 Model

In this section I present a model of career concerns in which I apply the insights from the political agency literature to the context of Colombian municipalities.³ Consider a two-period economy. In each period t , a politician in power must decide public spending and the tax rate, denoted by g_t and x_t , respectively. Between periods there is an election in which voters choose between the incumbent and a challenger. Each period the winning politician faces a balanced budget constraint⁴

$$g_t + r = \eta(x_t y + T) \tag{1.1}$$

where $r > 0$ is a fixed parameter that can be interpreted as a fixed cost or the prior obligations that must be met, y denotes the taxable revenue assumed to be constant and equal to one, T are the transfers from the central

3. The literature contains many career-concerns models of political incumbency; see Besley (2006) for a review. Mine is built on Persson and Tabellini (2000, Ch. 4.5).

4. It is reasonable to assume a balanced budget constraint for Colombian municipalities. Although some municipalities are allowed to run deficits, Colombian legislation (Law 358 of 1997) allows the central government to effectively limit the debt burden of municipalities according to their past performance, their own revenue, and to the implementation of a fiscal adjustment plan. These measures have proven to be very effective from 2000 onward (for instance, from 2000 to 2008, regional and local authorities averaged a fiscal surplus of 0.3% of GDP; see DAF (2009)).

government,⁵ and $\eta \in [0, 1]$ is a parameter that measures the level of honesty or integrity of the government.

The parameter η will be crucial to the analysis : it is the proportion of revenue not extracted as political rents during the period the politician is in power. I assume that it is determined randomly by nature,⁶ following a uniform distribution between $\frac{1}{\xi} - \frac{1}{2\psi}$ and $\frac{1}{\xi} + \frac{1}{2\psi}$. The parameter ψ can be interpreted as a measure of how precise the information about η is.⁷ This parameter is what distinguishes politicians belonging to new and old parties. Crucially, I assume that old and new parties have different ψ .⁸ In particular, I make the following assumption :

ASSUMPTION 1. *The precision of the information that voters have about η (as captured by the parameter ψ) is lower when the government is led by a politician from a new party*

A possible justification is as follows. By definition, new parties have never been in power. On the other hand, the political colleagues, bureaucracy and interest groups close to mayors from an old party are more known to voters : these parties have been in power before, for many years, and these structures usually persist. Since governments' honesty depends on these structures, then

5. I assumed $T > 0$ if $x_t > 0$ and $T = 0$ if $x_t = 0$. This assumption helps to guarantee an interior solution and is consistent with the capacity of the Colombian central government to punish municipalities with poor performance in collecting their own resources. See footnote 4

6. In Colombia, most of the corruption is done through the so-called "serrucho" (jigsaw) or "mordida" (bite). It corresponds to a percentage of the public good expenditures which is kept by members of the government in order to expedite or influence the licensing process. Usually this percentage is the outcome of bargaining between members of the government and contractors. For an empirical assessment of the most popular forms of corruption in Colombia see *Transparencia por Colombia* (2008, 2010, 2012).

7. Note that $var(\eta) = \frac{1}{12\psi^2}$; thus, a bigger ψ implies a lower $var(\eta)$.

8. I assume that new and old parties do not differ about ξ . This, however, is without a loss of generality, since, as discussed at the end of this section, public spending does not depend on ξ .

it is clear that when an old party is in power, relative to a new party, voters have more precise information about their level of honesty.⁹

Voters' one-period utility is quasi-linear, given by

$$w(g_t, x_t) = (1 - x_t) + H(g_t) \quad (1.2)$$

where H is a strictly concave, increasing function satisfying $\lim_{x \rightarrow 0} H'(x) = +\infty$ and representing the utility from consumption of public goods. For a given η , replacing (1.1) in (1.2), we get

$$w(g_t; \eta) = 1 - (g_t + r)\eta^{-1} + T + H(g_t) \quad (1.3)$$

It follows from (3) that for a given g_t , voters prefer a politician with high η . The utility of a politician leading a government with honesty parameter η is given by

$$v(g_t; \eta) = w(g_t; \eta) + R + (g_t + r)(1 - \eta)\eta^{-1} \quad (1.4)$$

where $w(g_t, \eta)$ is his utility as citizen, R is his utility from being in office, and

$$(g_t + r)(1 - \eta)\eta^{-1} = (1 - \eta)(x_t + T) \quad (1.5)$$

are the rents he gets while in office. If the politician is not elected, his utility

9. This assumption is especially true in Colombia. There are three main reasons : (i) the shared control that Liberals and Conservatives had of almost all the elected positions and public offices for more than a century, (ii) the candidate selection mechanism employed by these parties, usually based on the number and strength of the candidates' connections (see Pizarro, 2002, 2006), and (iii) their bureaucracy, usually composed of people from their own party (or "family") (see Gutierrez and Ramirez, 2002). The assumption is also consistent with the recognized correlation between the presence in power of politicians from new parties and the presence in the region of interest groups other than those associated with the traditional parties, mostly paramilitaries (see Gutierrez, 2007, Valencia, 2007, Acemoglu, Robinson, and Santos, 2010).

simply coincides with the utility of voters.

The timing of the game is as follows :

1. The politician in power at time $t = 1$ chooses a policy $g_1 \in \mathbb{R}_+$.
2. η is realized and observed by the politician, and the taxes x_t are residually determined so as to satisfy the government budget constraint.
3. Voters observe x_1 , but neither η nor g_t .
4. Elections take place, and each voter either supports the incumbent or the contender. If the incumbent loses, an opponent is appointed with an honesty parameter η' drawn at random from a uniform distribution between $\frac{1}{\xi} - \frac{1}{2\psi'}$ and $\frac{1}{\xi} + \frac{1}{2\psi'}$.
5. The politician in power at time $t = 2$ (the incumbent or a newly elected politician) chooses a policy $g_2 \in \mathbb{R}_+$. Payoffs are realized.

Two important assumptions here are that the politician does not know η when setting policy in period 1, and that g_1 is not directly observed by the voters. A possible justification for the first one is that η could depend on the qualities of the members of the government, or on demands from interest groups. It is reasonable to assume that the incumbent does not have perfect information about this.¹⁰ With respect to the second assumption, voters may not know exactly when the public goods are provided, or their final characteristics.¹¹

10. This assumption also simplifies the analysis, as there is no possibility of signaling. This is also assumed in Holmstrom (1999), Persson and Tabellini (2000, Ch. 4.5), Ashworth (2005) and Ashworth and Bueno de Mesquita (2008).

11. In addition to these assumptions, to guarantee the uniqueness of the equilibrium, it must be that

$$\kappa(x) = -\frac{xH''(x)}{H'(x)} \geq 1 \text{ for all } x \geq 0 \quad (1.6)$$

This assumption basically states that the coefficient of relative risk aversion of the voters relative to the consumption of the public good is greater than 1. See more about this assumption in Esteban and Ray (2001), who also introduce it.

1.2.2 Analysis of the Model

As a solution concept I focus on a subgame perfect equilibrium (SPE). I proceed by backward induction. For details and derivations, I refer to the Annex A. At $t = 2$, the politician in power solves a static problem : he maximizes his utility (1.4) and chooses

$$g_2^* = H'^{-1}(1) \quad \text{and} \quad x_2^* = \eta^{-1}(H'^{-1}(1) + r) - T \quad (1.7)$$

I now move to period 1. The politician chooses spending without knowing η , in order to maximize his two-period utility. At the time of the election, the voters know x_1 and make a conjecture about spending, denoted by \tilde{g}_1 . Hence, using (1.1), they form an estimate of the incumbent's honesty, $\tilde{\eta}$, given by

$$\tilde{\eta} = \frac{\tilde{g}_1 + r}{x_1 + T} \quad (1.8)$$

Note that \tilde{g}_1 does not depend on η because voters know that spending is chosen by the politician before observing η . In equilibrium, voters' expectations are correct : \tilde{g}_1 coincides with the actual spending level chosen by the politician.

The voters' behavior can be described as follows : from (1.3) and (1.7), note that voters' utility in the second period is increasing in η . Then, the incumbent is re-elected only if his estimated honesty exceeds his opponent's

expected honesty.¹² If his opponent's honesty is η' , he is re-elected if

$$\tilde{\eta} > E[\eta'] = \frac{1}{\xi} \quad (1.9)$$

One can now compute the probability of winning the election as perceived by the incumbent at the beginning of period 1. By assumption, he does not yet know his own η . The incumbent sets g_1 , knowing that x_1 is residually determined from (1.1). Combining (1.1) with (1.8), (1.9) is equivalent to

$$\eta > \frac{g_1 + r}{\xi(\tilde{g}_1 + r)} \quad (1.10)$$

From the point of view of the incumbent politician, the probability of winning the election is the probability that this inequality is satisfied. Under the assumption that the distribution of η is uniform, this probability is given by

$$Pr\left(\tilde{\eta} > \frac{1}{\xi}\right) = \frac{1}{2} + \psi\left(\frac{1}{\xi} - \frac{g_1 + r}{\xi(\tilde{g}_1 + r)}\right) \quad (1.11)$$

The expression in (1.11) is crucial for the analysis : it shows that a variation of g_1 has a differential effect on the probability of incumbent reelection depending on ψ . Specifically, it shows that the smaller ψ is, the more sensitive this probability is to changes in g_1 .

At $t = 1$, given \tilde{g}_1 , a politician with an honesty parameter η solves the

12. Note that the fact that only the expected value of η (and not its variance) is what matters when deciding whether or not to re-elect the incumbent (i.e., newness of the parties does not *directly* influence voters' decisions) explains why candidates from new parties have a positive probability of being re-elected. A question that this model does not address is why candidates from new parties are elected for the first time.

problem

$$\max_{g_1 \geq 0} E[v(g_1; \eta)] + Pr\left(\tilde{\eta} > \frac{1}{\xi}\right) E[v(g_2^*; \eta)] + \left(1 - Pr\left(\tilde{\eta} > \frac{1}{\xi}\right)\right) E[w(g_2^*; \eta')] \quad (1.12)$$

subject to (1.1), (1.7) and (1.11), where η' is the honesty parameter of the opponent.

It is clear from (1.11) and (1.12) that the politician faces the following trade-off. He can choose a high level of spending, which implies high taxes and large political rents but a lower probability of re-election and the corresponding future political rents, through a decrease in voters' perception of his honesty. Alternatively, he can choose lower spending today, in the hope of winning re-election and gaining larger future political rents. The solution to this trade-off, and the corresponding equilibrium, is given by (1.12), where the voters' estimate of g_1 , \tilde{g}_1 coincides with this solution. It is possible to show (see proposition 1 below) that this solution is implicitly given by

$$H'(g_1^*) - 1 - (R + (H'^{-1}(1) + r)(\xi - 1)) \left(\frac{\psi}{\xi(g_1^* + r)}\right) = 0 \quad (1.13)$$

where we have used the equilibrium condition $\tilde{g}_1 = g_1^*$. It is easy to see in (2.38) that $H'(g_1^*) - 1 > 0$, or equivalently, $g_1^* < H'^{-1}(1) = g_2^*$. This relation shows how politicians solve the aforementioned trade-off : they will choose lower levels of spending and taxes relative to what they would choose if their political future was not an issue. This first result is stated in the following proposition.

PROPOSITION 1. *In the unique SPE equilibrium of the game described above, spending in the first period is given by (2.38), and spending in the second period is given by (1.7).*

Démonstration. See Annexe A. □

The following corollary will be crucial in relating the size of government chosen by the politician in the first period with his political party.

COROLLARY 1. *A decrease in ψ increases the size of government chosen by the politician in the first period.*

Corollary 1 states that the information about the honesty of politicians is crucial. The mechanism is the following : less precise information (lower ψ) means that the actions of the politicians in power in period 1 are less informative, which decreases the politician's incentives to please the voters. This results in greater levels of spending in period 1.¹³ The important point about this corollary is that it allows us to establish the impact of the presence of a politician from a new party in power : given that, by Assumption 1, for these politicians the information about their qualities is less precise, they choose in the first period higher levels of spending and taxes relative to what a politician from an old party would have chosen.

Since new parties often have anti-corruption platforms, readers may wonder whether Corollary 1 still holds if we assume that politicians from new parties are more honest on average (i.e., they have higher ξ). As shown in the proof of Proposition 1, g_1^* in reality does not depend on the level of honesty of the incumbent, ξ , but only that of the challenger. Thus, even if we assume that politicians from new parties are ex ante more honest,¹⁴ we would still have that new parties spend more than old parties.

Related to this last point note that from equation (1.5) the level of rents captured by politicians depends on η (a primitive of our analysis) and on

13. Note that since the politician (as well as the voters) does not know η when setting policy in period 1, the result in Corollary 1 admits the interpretation of a politician choosing greater levels of spending as insurance against non-reelection.

14. As I argue in Section 5.3., this seems to be the case for Colombia, at least relative to the traditional forms of corruption.

government's size (which is determined in equilibrium). In particular, note that if we assume that new and old parties mayors have the same ξ , the model implies that new parties mayors would capture more rents since they spend more. However, if new party mayors have a lower ξ , expected rents in municipalities run by new party mayors might actually be lower.¹⁵

In the rest of the chapter I test the prediction that in municipalities governed by a new party, spending and taxes are higher than in municipalities governed by an old party. In addition, I perform robustness checks to confirm that the difference is due to the political party of the incumbent, and I try to verify that this difference depends on the level of information that voters have about their mayors, as stated by Corollary 1. I start with a description of the context, and then I present the data, the specification and the empirical results.

1.3 Context : Colombian Local Governments

The study of Colombian local governments is appealing for three main reasons : their homogeneity relative to the institutional rules and prerogatives, their high level of operational independence, and the existence of numerous and heterogeneous new political parties successfully competing against two well-defined traditional parties.

Colombian municipalities are the smallest and most fundamental administrative units in the country. As of June 2012, there are 1,103 municipalities

15. To see this note that in equilibrium the expected rents captured by the incumbent are given by $(\xi - 1)(g_1^* + r)$, where g_1^* is given by (2.38). As shown in the proof of Proposition 1, in the strict sense, g_1^* is not a function of ξ , but of the average level of ex ante honesty of the challenger. Thus if ξ is sufficient close to 1, i.e., if voters ex ante think that an incumbent from a new party is sufficiently honest, then even if he spend more that a incumbent from an old party, expected rents captured by new party governments can be similar or even lower than those captured by old party governments.

in Colombia. They are governed by a mayor, who is elected by popular vote for a period of four years.¹⁶ While immediate re-election is not possible, officials usually run for re-election in the same post in the future, or for election to other posts in later years.¹⁷ Thus, I expect that the model in Section 2 is a good approximation of policy making by Colombian mayors.¹⁸ At the time of the mayoral election, voters also elect a local council, whose function is to approve some of the mayor's proposals, including the city's budget. Several commentators have argued that councils have now a limited role in Colombia and that mayors can easily pass their proposals.¹⁹ The rules that govern elections and the duties of these elected officials are set in national law and apply uniformly across all municipalities.

Colombian local governments are characterized by a relatively high level of operational independence. This independence is the result of a process of economic decentralization, which started in the late '80s, reached its peak with the 1991 constitutional reform and was completed in the late '90s. This process can be divided in two stages : first, a stage of restructuring of tax structures, which allowed municipalities to define tariff rates and exemption mechanisms (see Echavarria, Renteria, and Steiner, 2002, Faguet and

16. Mayors were elected initially for a period of two years (from 1988 to 1993), subsequently increased to three (from 1994 to 1997) and, since 2004, to four-year terms.

17. According to my calculations, more than 30% of the mayors elected for the period 1997-2000 run for reelection in same post for the periods 2003-2007 or 2007-2011, and this percentage is certainly much higher if we include other posts (as municipal councils, department or provincial assemblies, governorships, and seats in the Congress).

18. See Moreno and Escobar-Lemmon (2008) for evidence of individualistic career concerns in Colombia during the period 1958-2002. See Drazen and Eslava (2010) for a re-election concerns model used to explain the existence of political budget cycles in Colombian municipalities.

19. According to *Transparencia por Colombia*, Transparency International's chapter in Colombia, the mayor is almost the only focus of attention of voters, and the only source of local political leadership (see *Transparencia por Colombia*, 2007). A similar thesis is defended by Gutierrez (2010).

Sanchez, 2008, 2009),²⁰ and second, a stage of expansion of the responsibilities assigned to municipalities regarding the provision of public services and social investment, made possible by an increase in transfers from the central government to municipalities (see Echavarria, Renteria, and Steiner, 2002, Faguet and Sanchez, 2008, 2009).²¹ The aggregate effect of these fiscal reforms was a large increase in the political authority and operational independence of municipal governments, which was accompanied by a huge rise in the resources they controlled. In the period considered in this chapter (1997-2011), Colombian municipalities funded their expenditures (investment and current spending) partly with resources collected by the central government and transferred to them and with royalties from the extraction of natural resources (around 60% of municipalities' revenues) and partly with local taxes (around 40% of municipalities' revenues). The largest municipalities are allowed to run deficits, although this is heavily controlled by central authorities. Municipalities are completely autonomous in how to use revenues from local taxes, and in how to spend an important percentage of resources transferred from the central government.

The third and most interesting feature of Colombian local politics is the existence of a large quantity of ephemeral and very successful new politi-

20. Today, Colombian municipalities are autonomous in defining and collecting five types of taxes : industry, commerce and advertising tax, unified property tax, tax on automotive vehicles, urban demarcation tax and surplus value tax. Additionally, they can collect a surcharge on gasoline (see DNP-DDTS, 2005). Although there are limits defined by law, municipalities have significant flexibility in setting tax rates.

21. Part of these resources is earmarked by the central government to be spent on education and health. The determination of the transferred funds and the percentage earmarked is complex, and involves two different sources : (i) "municipal participation", which uses municipal population adjusted for poverty level, unmet basic needs, own-source fiscal contribution and administrative efficiency indicators ; and (ii) "situado fiscal", based partly on equal allocations to all departments and municipalities and partly on a per capita formula. At least the 20% of these resources can be freely allocated by municipalities (see Echavarria, Renteria, and Steiner, 2002).

cal parties competing against two very old and powerful traditional parties. This phenomenon has been explained as the result of two reforms that occurred simultaneously to the process of economic decentralization described in the previous paragraph : the introduction of direct popular election for mayors, and an important reduction to the costs of creating new parties.²² With respect to the first reform, since mayors were previously appointed and dismissed by the president, popular elections made local politicians less dependent on traditional parties (see Duque, 2006; Gutierrez, 2007; Dargent and Munoz, 2011). The second reform allowed different kinds of associations or movements, and even independent candidates, to participate in elections and receive partial public funding (see Pizarro, 2006; Duque, 2006, 2010; Gutierrez, 2007; Rubio, 2010; Dargent and Munoz, 2011).

The Colombian party system is one of the oldest and most institutionalized in Latin America (see Mainwaring and Scully, 1995). It has been dominated by two parties, the Liberal and Conservative parties, founded in 1848 and 1849 respectively, and which maintained the monopoly of power at all levels of government for more than a century. As an example of this, in 1958, as a mechanism to end the partisan violence that ravaged the country for more than a decade, Liberals and Conservatives signed a pact, known as the National Front, which guaranteed equal shares of elected positions and public officers for four presidential terms. Although this pact expired in

22. According to the law applicable to the period studied (Article 108 of the 1991 Constitution and Article 3 of Law of 1994), Colombian political actors are defined as those parties, political movements, social movements, or significant groups of citizens able to participate in elections through endorsement, the creation of a party or movement recognized by the National Electoral Council, or payment of a registration fee. The National Electoral Council grants legal status to those political parties or movements that can prove their existence with at least 50,000 signatures, or that obtained at least this same number of votes in the last elections, or that attained representation in the National Congress. This new legislation has been accused of being particularly responsible for having "opened the floodgates" for new political forces (see Pizarro (2006))

1974, some authors have argued that it had important consequences for the current Colombian political system and its party structure. First, it allowed traditional parties to enhance their bases of support and to exclude local independent politicians (see Archer and Shugart, 1997; Pizarro, 1997; Bejarano and Pizarro, 2005; Gutierrez, 2007; Dargent and Munoz, 2011). Second, it weakened inter-party competition and encouraged intra-party competition and regional factionalism, which made irrelevant, at least at the local level, the classic left-versus-right conflict (see Boudon, 2000; Pizarro, 2002, 2006; Gutierrez, 2002; Bejarano and Pizarro, 2005; Roland and Zapata, 2005; Botero, Losada, and Wills, 2011).

It was in this context that the reforms mentioned before were implemented. The popular elections for local authorities, the reduction of the costs of creating new parties, the greater operational independence of the municipalities and a party system with high levels of intra-party competition were accompanied by a spectacular increase in political competition. Relatively small parties and movements constituted credible third-party options. This change did not imply, however, a complete collapse of the traditional party system : the Liberals and Conservatives continued winning an important percentage of the posts at all levels of government (more than the 50% for the period studied), and their collective reputation did not change dramatically (see Garcia, 2000; Gutierrez, 2002; Pachón, 2002; Hoyos, 2007). What did seem to happen instead was that new and independent people were able to run in elections, and politicians belonging to the traditional parties but ranking low in their national hierarchies decided to become independent candidates under new party labels (see Taylor, 1995; Gutierrez and Davila, 2000; Giraldo, 2003; Bejarano and Pizarro, 2005; Gutierrez, 2006a, 2007).²³

23. There is a debate about the true level of independence of the politicians that belonged to a traditional party and then run under different party labels. In this respect I agree with Gutierrez and Ramirez (2004) when they say that these politicians all shared a “very diffuse

One important consequence of this rapid transformation of the party system is that the traditional party labels lost their (already weak) ideological content (see Pizarro, 2002; Bejarano and Pizarro, 2005, Roland and Zapata, 2005; Duque, 2006; Gutierrez, 2007). Additionally, in part as a consequence of a series of corruption scandals affecting prominent figures of the traditional parties (see Gutierrez and Ramirez, 2004; Gutierrez, 2006b, 2007), the qualities of the politicians, already one of the main concern of voters, started to be associated with the distinction between traditional and new parties. While politicians running under new party labels emphasized their independence from the traditional (and corrupt) bureaucratic structures (see Gutierrez, 2003; Gutierrez and Ramirez, 2004; Gutierrez, 2006b, 2007), politicians running under traditional party labels emphasized their connections and experience in past (and, in some cases, honest) governments (see Gutierrez, 2003, 2006a, 2007; Pizarro, 2006). This does not imply that politicians running under traditional party labels were always associated with corrupt governments (although it was often the case), and politicians from new parties were *a priori* considered as honest. However, as stated in Section 2, what seems to be clear is that while traditional party labels provided relatively reliable information about this quality (given the well known reputation of their past governments), new party labels, insofar as they informed only about the independence of the candidates from the traditional structures, did not.

identity [...] a sense of independence, and access to resources independent of the centre of the party, all of which distances them from the traditional world of party dissidents" (see Gutierrez and Ramirez, 2004, p. 237; see also Gutierrez and Davila, 2000).

1.4 Data and Empirical Strategy

1.4.1 Data

The analysis uses data on fiscal and electoral outcomes in Colombian municipalities. The electoral outcomes were obtained from the Colombian Electoral Agency and correspond to the period 1997 to 2007. I focus on mayoral elections. Four sets of elections took place during this period, in 1997, 2000, 2003 and 2007. Although mayoral elections were first implemented in Colombia in 1988,²⁴ the electoral data covering the period from 1988 to 1997 has important limitations : for instance, it is not possible to identify, for an important number of municipalities,²⁵ the candidates participating in each election, their political party, and the number or percentage of votes that each candidate obtained. This is why my analysis starts in 1997. This, however, does not imply a significant loss : the participation and success of non-traditional parties is not very prevalent before the 1997 election.²⁶

For every municipality and election year (between 1997 and 2007) for which there is available data, I compiled the number of votes received by each candidate and the name of the political party or movement each candidate belongs to. In total, I have data for 3,892 elections. I then identified the elections in which a candidate from a new party won and a candidate from a traditional party placed second, and those in which a candidate from a new party placed second and a candidate from a traditional party won. This

24. Since then, nine elections have taken place : 1988, 1990, 1992, 1994, 1997, 2000, 2003, 2007 and 2011.

25. The complete information is available only for the capitals of the departments and "Ciudades Zonificadas" (with borough mayors), which represent less than the 10% of municipalities.

26. According to my calculations, for the elections occurred between 1988 and 1994, only 17 parties other than the two traditional parties won at least once in any municipality. These victories constituted the 15% of all the elections that occurred during this period.

happened in 1,608 elections, which corresponds to 41.3% of elections. It is on these elections that I focus the analysis.²⁷

It is important to discuss the criterium that I use to distinguish new from traditional parties. Although not very homogeneous internally,²⁸ the Liberals and Conservatives have relatively solid and unitary structures, and are affiliated with bureaucracies and interest groups that are relatively well-known to voters. I classify these two parties as old.²⁹ New parties are numerous and successful. In the 1997-2007 period, at least 240 different non-traditional parties participated in elections in at least one municipality (and ended 1st or 2nd), and at least 164 new parties won at least one election. New parties won 1,456 elections, which amounts to 37% of the total number of elections. Additionally, the origin of these parties is very diverse, with 170 being local political movements (participating in only one municipality). Among the new parties, it is not possible to identify a party that was much more successful than the others. No party won more than 10% of the elections won by new parties; 13 different parties have won between the 1% and 10%.³⁰ These

27. In the rest of the elections, the first two positions were occupied either by two candidates from old parties (33.8%) or by two candidates from new parties (17.3%). There were also elections with only one candidate participated (2.3%), or where at least one of the first two positions was occupied by a candidate from a coalition formed by new and old parties (5.3%).

28. During the period I focus on, the Conservative party had some known factions, which were recognized as its constituent parts. Following Roll (2002), Pachón (2002) and Hoyos (2007) (who got the information directly from the Conservative party registers), the political movements that I classified as factions are : Movimiento Humbertista, Conservatismo Independiente, Movimiento de Salvacion Nacional, Movimiento Nacional Conservador, Movimiento Fuerza Progresista, Nueva Fuerza Democratica, Movimiento Unionista, Movimiento Progresismo Democratico, Vamos Colombia. In addition to this list of factions, I classified as factions all the coalitions between these factions and the Conservative party.

29. There are also cases of coalitions that include one of the two old parties and one or more new parties. Since for these cases I cannot identify clearly whether they are new or old parties, I eliminate these observations, which account for about 5.3% of all the observations.

30. As previously noted, new parties victories in municipal elections have been conti-

parties also have no experience in government, confirming that their classification as new is appropriate. In the 1997-2007 period, around 11% of the non-traditional parties (that ended 1st or 2nd) had won before in the same municipality, representing around 10% of the elections which a candidate from a new party and a candidate from a traditional party placed first and second. Since it is difficult to say whether these experienced non-traditional parties are new to voters, I eliminate observations with one of them winning or finishing second. The results are, however, robust to their inclusion.

To summarize, throughout my study I define a party participating in a given municipal election as *new* if *it is not one of the two traditional parties and if the party has never won an election in that municipality*.

I merge this electoral data with municipal-level public finance variables. In particular, I focus on capital expenditure (investment) and local taxes. Detailed data is available starting in 1993 from the Colombian National Planning Department (DNP).³¹ This data corresponds with the figures in the financial report each municipality files annually with local and national agencies tasked with monitoring public finances (*Contralorias Municipales* and *Contraloria General de la Republica*). This data is available at some relevant disaggregated level. For this study, it is relevant to know that total spending is divided into two categories : current expenditure, composed mainly of purchases of supplies and payments of salaries to government employees, and capital expenditure, which corresponds to investment in urban

nuously increasing. Although for the period studied no new party won more elections than any of the two traditional parties, this situation changed in the last election (the 2011 election, not included in the sample because the data for public finances has not been produced yet). In this election, and for the first time in history, a new party (the *Partido de la U*) won the majority of municipal elections (24% versus 18% and 16% for the traditional parties).

31. This data is available for the period 1993-2011; it can be consulted here <http://www.dnp.gov.co/Programas/DesarrolloTerritorial/FinanzasP%C3%BAblicasTerritoriales/EjecucionesPresupuestales.aspx>

infrastructure, education, health and housing projects. In the 1997-2011 period, current expenditure and capital expenditure corresponded to 19% and 81% of the total spending, respectively. Total revenue is divided into current and capital revenue, corresponding to 41% and 59% of the total, respectively. Within the category of current revenue, local taxes correspond to the 75% of the total.³² Capital revenue is mainly composed of transfers from the central government (74%) and royalties from the extraction of natural resources (20%).³³ I express all variables in thousands of 2008 pesos, and use the CPI as deflator.³⁴ I use the information corresponding to the terms in which the mayors were in office³⁵ and compute the averages over these terms. In case of missing values, I use only the information available to calculate the average.³⁶ Moreover, I do not use information for municipalities that do not report total spending.

Finally, the sources of other variables used as controls and to examine whether the sample is balanced are listed in the note to Table 1.1.

1.4.2 Empirical Strategy and Identification

I use a regression discontinuity design (RDD) to study the impact of new parties on policy outcomes in Colombia's municipal mayor elections. This design addresses the potential endogeneity between new party mayors and

32. The other part includes charges for services provided by the municipality, and fines.

33. A small part of the capital revenue (6%) comes from donations, gains on sale of municipal property, and municipal enterprises' profits.

34. The CPI is provided by the Colombian National Administrative Department of Statistics.

35. That is, 1998-2000 for the mayors elected in 1997, 2001-2003 for the mayors elected in 2000, 2004-2007 for the mayors elected in 2003, and 2008-2011 for the mayors elected in 2007.

36. For example, if for some municipality, for the 1997-2000 period, I only have information for 2000, I use this value as the average of this period. If I do not have information for any year during this period, I eliminate the observation.

policy outcomes. Regression discontinuity design relies on the existence of a dichotomous treatment variable that is a deterministic function of a single continuous covariate. If individuals pass some threshold level of the variable, they are assigned to the treatment group; otherwise, they are assigned to the control group. Elections are an ideal situation for its use because candidates are only elected if their margin of victory (for example between the candidates who got the two highest number of votes) passes the zero threshold. I compare municipalities in which a politician from a new party barely defeats a politician from a traditional party, to those municipalities where a politician from a new party barely lost. If the final vote share includes a continuous density, then the results of a closely contested election can be taken as random. Then, the comparison of these municipalities with respect to a particular outcome measures the causal effect of the presence of a politician from a new party on this outcome.

I implement the RDD strategy by restricting the sample to the elections where one of the first- and second-place candidates is from a new party, and the other is from an old party.

As in the standard literature on RDD (see Imbens and Lemieux, 2008, Lee and Lemieux, 2010, Ferreira and Gyourko, 2009, 2011), I consider the following model :

$$S_{m,t} = \beta_0 + \beta_1 Nwin_{m,t} + P(margvic_{m,t} * \beta) + \beta_X X_{m,t} + \epsilon_{m,t} \quad (1.14)$$

where $S_{m,t}$ is the policy outcome of interest in municipality m in the term immediately following election t , $Nwin_{m,t}$ is a dummy that takes on a value of one if a candidate from a new party won the mayoral race in election

t in municipality m , $P(\cdot)$ is a k th-order polynomial in the vote share,³⁷ $margvic_{m,t}$ is the margin of victory in election t in municipality c , defined as the difference between the percentage of votes received by the winner and the percentage of votes received by the second-place candidate,³⁸ β are the respective vote-share coefficients, and $\epsilon_{m,t}$ is the stochastic error term. Some specifications also include $X_{m,t}$, a set of controls including city population and year and region fixed effects, which are not necessary for identification, but their inclusion improve the precision of the estimates.

Identification requires that all relevant factors other than treatment vary smoothly at the threshold between a new party victory and a new party loss. That is, letting S_1 and S_0 denote potential outcomes under a new party victory and new party loss, respectively, and $margvic$ denote the new party margin of victory, identification requires that $E[S_1|margvic]$ and $E[S_0|margvic]$ are continuous at the new party win-loss threshold. This assumption is needed for municipalities where a new party barely wins to be an appropriate counterfactual for municipalities where a new party barely loses.

37. As in standard literature, if $k=3$, $P(\cdot)$ has the form :

$$P(margvic_{m,t} * \beta) = \beta_{m,t} \eta a_2 margvic_{m,t} + \beta_3 margvic_{m,t}^2 + \beta_4 margvic_{m,t}^3 + \beta_5 margvic_{m,t} * Nwin_{m,t} + \beta_6 margvic_{m,t}^2 * Nwin_{m,t} + \beta_7 margvic_{m,t}^3 * Nwin_{m,t}$$

I consider different values of k , which correspond to different bandwidths (see Lee and Lemieux, 2010).

38. As in Ferreira and Gyourko (2009, 2011), I use margin of victory instead of vote share in order to facilitate comparison across elections, as in general there are more than two candidates in each election.

TABLE 1.1: Baseline characteristics

	5% vote spread New party won	New party lost	T-stat on means difference	RD estimate	SE on RD estimate
	(1)	(2)	(3)	(4)	(5)
<i>Public finance</i>					
Log total expenditure per capita (t-1)	-2.171	-2.301	1.069	0.031	0.096
Log current expenditure per capita (t-1)	-3.511	-3.632	1.235	0.115	0.110
Log capital expenditure per capita (t-1)	-2.512	-2.667	1.106	0.010	0.120
Log total revenue per capita (t-1)	-2.172	-2.281	0.932	0.012	0.110
Log tax revenue per capita (t-1)	-4.857	-5.014	0.995	0.219	0.189
Log capital revenue per capita (t-1)	-2.558	-2.460	-0.591	-0.044	0.198
Total decit per capita (t-1)	0.005	0.002	0.504	0.010	0.009
<i>Election characteristics</i>					
Year of the election	2003.759	2003.716	0.119	-0.000	0.000
New party incumbent	0.342	0.295	0.906	0.071	0.106
Liberal party incumbent	0.342	0.392	-0.949	-0.142	0.108
# candidates	4.146	4.091	0.256	-0.155	0.476
<i>Demographic characteristics</i>					
Population (t-1)	33883.032	36004.139	-0.163	29806.248	21190.385
% urban/rural (t-1)	1.874	2.112	-0.456	1.160	1.112
Population density (t-1)	115.155	105.511	0.287	132.142	101.929
<i>Economic characteristics</i>					
% unsatisfied basic needs (1993-2005)	48.825	49.547	-0.320	1.572	6.207
<i>Institutional characteristics</i>					
Total courts (1997)	3.150	3.267	-0.102	2.700	2.051
Total bank branches (1997)	1.692	1.873	-0.301	1.108	1.003
Total hospitals (1997)	0.842	0.896	-0.193	0.510	0.472
Total schools (1997)	10.938	12.628	-0.426	7.017	6.860
Total community organizations (1997)	150.686	139.178	0.413	88.362	60.686
<i>Conflict and Crime</i>					
Annual homicide rate per 10000 inhab. (t-1)	0.535	0.517	0.312	0.041	0.105
Forced displaced rate per 10000 inhab. (t-1)	2.609	2.533	0.160	1.624	1.015
Presence of Guerrilla (t-1)	0.551	0.534	0.302	0.107	0.109
Presence of Paramilitares (t-1)	0.304	0.290	0.279	-0.027	0.100
<i>Geographic characteristics</i>					
Surface area km ²	694.748	1053.526	-1.687	-472.120	468.163
% municipalities in the atlantic coast	0.171	0.199	-0.655	-0.114	0.075
% municipalities in the pacific coast	0.165	0.125	1.027	0.063	0.111
% municipalities in the central region	0.139	0.205	-1.574	0.086	0.087
% municipalities in the eastern region	0.361	0.335	0.488	-0.054	0.106
% municipalities in the amazon region	0.038	0.040	-0.085	-0.016	0.047
% municipalities in Antioquia	0.120	0.097	0.695	0.025	0.040

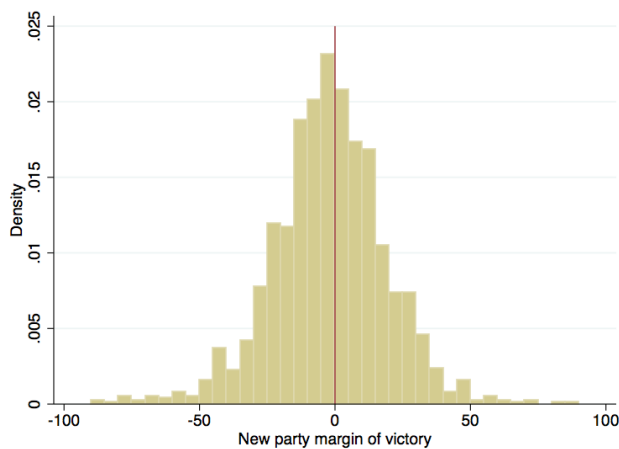
Notes : Data on municipal public finance are from the National Planning Department (DNP). Electoral data are from the Electoral Agency. Data on population, proportion of urban to rural population, population density and proportion of people with Unsatisfied Basic Needs (used as a proxy for poverty) are from the National Administrative Department of Statistics (DANE). Data on the number of courts, bank branches, hospitals, schools and community organization are from a non-profit civil foundation, the Social Foundation (Fundacion Social). Data on homicides are from the National Police and data on conflict are from the Conflict Analysis Resource Center (CERAC). Data on forced migrant households are from the Presidential Agency for Social Action (Accion Social). Data on surface area are from the Colombian Federation of Municipalities. Column (3) reports the t-statistic on the difference in means between municipalities where a new party won and where it barely lost. Column (4) reports the coefficient on new party win ($Nwin$) from equation (1.14) when the respective characteristic is used as the dependent variable, and column (5) reports the RD standard errors.

To assess the plausibility of this assumption, Table 1.1 compares municipal spending, revenue, transfers, deficit, political, economic, demographic, institutional, geographic and crime and conflict characteristics in municipalities where a new party barely lost to those in municipalities where it barely won. Size-of-government characteristics include all the components of spending, revenue and deficit in the term before the new party mayor was in office. As political characteristics, I consider dummies for the party of the mayoral incumbent and the number of candidates. Demographic characteristics are population, the proportion of urban to rural population and population density. Economic characteristics include the percentage of the population with unsatisfied basic needs and institutional characteristics are the total number of courts, bank branches, hospitals and schools. Geographic characteristics are the percentage of municipalities belonging to the main Colombian geographic zones. Sources for these variables are listed in the note to Table 1.1.

Column (1) of Table 1.1 reports the mean value for each variable in municipalities where a new party barely won, column (2) does the same for municipalities where a new party barely lost, and column (3) reports the t-statistics on the difference in means. The sample is limited to elections with a vote spread between the winner and the runner-up of five percentage points or less. In no case is there a statistically significant difference between municipalities where a new party lost and municipalities where a new party won. Moreover, I run the local linear regression specification using each of the baseline characteristics as the dependent variable. The coefficient $Nwin$ is reported in column (4) and the standard errors are reported in column (5). In no case are the coefficients, estimated by local linear regression statistically different from zero. Overall, this evidence strongly suggests that municipalities where a new party barely loses are a valid control group for municipalities where they barely win.

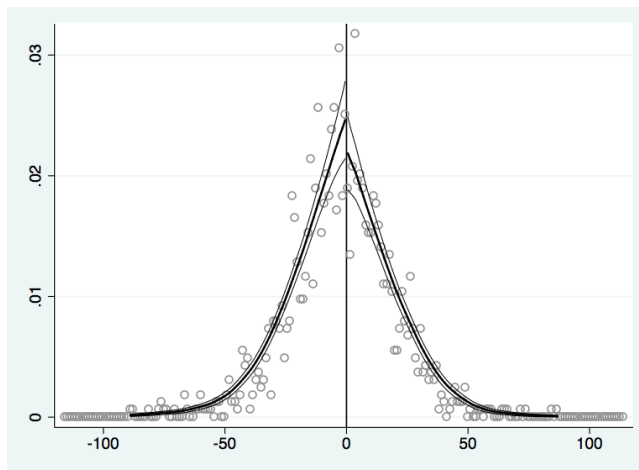
Finally, identification also requires the absence of selective sorting around the new party win-loss threshold, i.e., that the results of a closely contested election can be taken as random. Visual inspection of the density function of the margin of victory (Figure 1.1) suggests that there is no discontinuity of the function at the threshold. A more formal test is given by McCrary's test (see McCrary, 2008). With a log difference in the height of the density function at the threshold equal to -0.128, and an standard error of 0.101 (see Figure 1.2), I confirm that there is no discontinuity in the density at the normalized threshold.

FIGURE 1.1: Density function of the margin of victory



Notes : Density function of the margin of victory between new and old party candidates (bin width = 5%).

FIGURE 1.2: McCrary's test



Notes : Finely-gridded histogram smoothed using local linear regression, separately on either side of the cutoff of the density function of the margin of victory between new and old party candidates (McCrary, 2008)

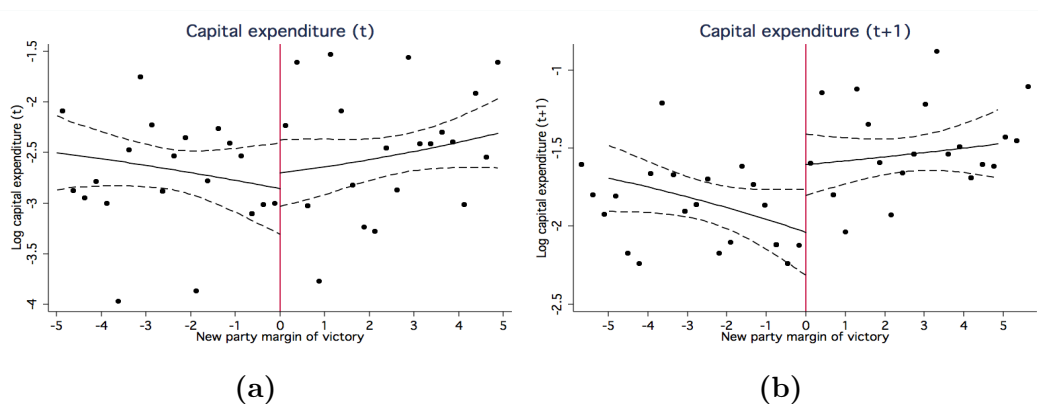
1.5 Results

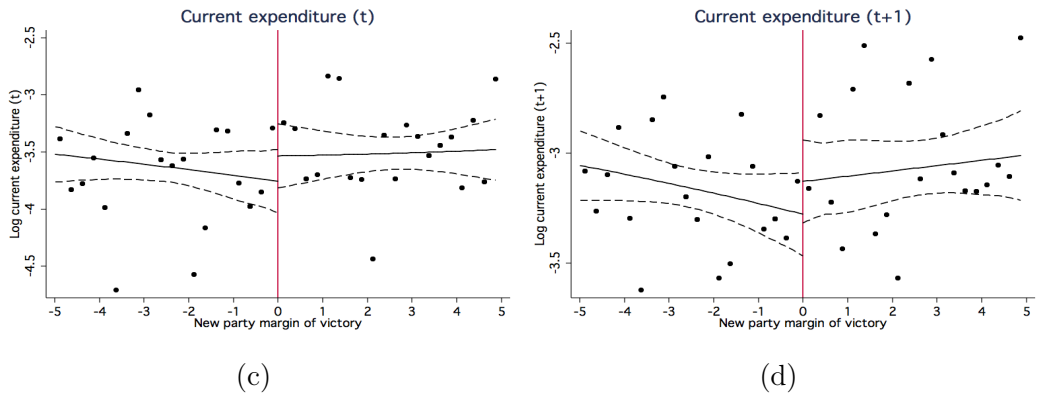
Panels (a)-(d) in Figure 1.3 plot capital expenditure (investment) and current expenditure against the margin of victory for the new party. A negative margin indicates a new party loss. Each dark point represents the average value of the outcome in vote spread bins of width 0.25. The solid line plots predicted values from a local linear regression, with separate vote spread trends estimated on either side of the new party win-loss threshold. The bandwidth is chosen using the Imbens-Kalyanaraman bandwidth selection rule (see Imbens and Kalyanaraman, 2009). The dependent variables in panels (a) and (c) are the values in the term before the mayor is in office.³⁹

39. For all variables I compute the logarithm of the per capita values.

The dependent variables in panels (b) and (d) are the values in the term during which the mayor is in office. Panel (b) shows that during the term of office there is a marked discontinuity at the threshold between a new party loss and a new party victory. Per capita investment is higher in municipalities governed by new party mayors than in those governed by a mayor from an old party. As will be shown below, the difference is statistically significant. For current spending (panel (d)), the effect is less clear. Panels (a) and (c) show that in the period before the mayor was in office, the values were similar (or statistically insignificant different) in municipalities where the new party barely won as compared to those where they barely lost, supporting the plausible exogeneity of close elections.

FIGURE 1.3: Close new parties victories and spending





Notes : This figure plots municipal public finances against the new party margin of victory, with a negative margin indicating a new party loss. The solid line plots predicted values from a local linear regression, with separate vote spread trends estimated on either side of the new party win-loss threshold. The bandwidth is chosen using the Imbens-Kalyanaraman bandwidth selection rule (Imbens and Kalyanaraman, 2009), as implemented in the Stata ado file named `rdob.ado` (available on Imbens' website).

This graphical analysis shows that capital spending is higher in municipalities governed by mayors from new parties. I examine this result in more detail by reporting the estimates given by equation (1.14) in Table 1.2. Columns (1) and (2) report estimates when a linear functional form is used for the RD polynomial, for the entire sample, with and without controls. Besides capital and current spending, I also include total spending. My estimate indicates that in municipalities where a new party mayor takes office, capital spending (investment) is around 10 percentage points higher than in municipalities where the mayor is from an old party. Total spending is also higher (around 8 percentage points), and current spending, although with a positive sign, is not statistically significant.

TABLE 1.2: Close new party election and spending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total spending	0.077* (0.041)	0.095*** (0.032)	0.073 (0.048)	0.103** (0.041)	0.116* (0.061)	0.129** (0.055)	0.119* (0.069)	0.108* (0.057)
R-squared	0.752	0.822	0.752	0.822	0.752	0.823	0.752	0.823
Observations	1504	1501	1504	1501	1504	1501	1504	1501
Capital spending	0.093** (0.043)	0.114*** (0.033)	0.105* (0.053)	0.141*** (0.044)	0.143** (0.066)	0.159*** (0.058)	0.137* (0.079)	0.126** (0.063)
R-squared	0.755	0.828	0.755	0.828	0.756	0.828	0.756	0.828
Observations	1504	1501	1504	1501	1504	1501	1504	1501
Current spending	0.025 (0.044)	0.030 (0.039)	-0.011 (0.049)	-0.001 (0.043)	0.027 (0.066)	0.032 (0.064)	0.033 (0.071)	0.022 (0.060)
R-squared	0.622	0.694	0.622	0.694	0.623	0.695	0.623	0.695
Observations	1504	1501	1504	1501	1504	1501	1504	1501
Covariates	no	yes	no	yes	no	yes	no	yes
Polynomial	linear	linear	quadratic	quadratic	cubic	cubic	quartic	quartic

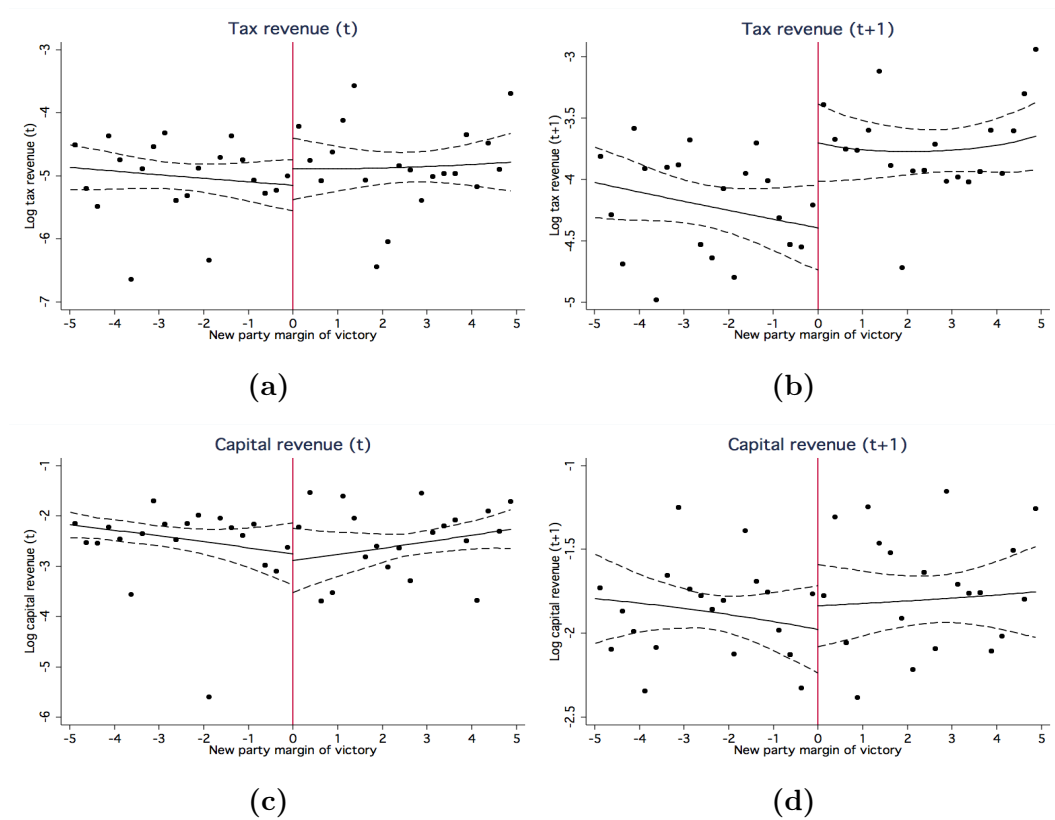
Notes : All columns report the coefficient on new party win (*Nwin*) from equation (1.14) when the respective characteristic is used as the dependent variable. Controls include population, proportion of urban population, percentage of households with unsatisfied basic needs, a dummy variable for an incumbent from another new party, the number of candidates in the election, surface area, population density, annual homicide rate, dummy variables for the presence of guerrilla and paramilitary forces, as well as fixed effects for department and year. Robust standard errors clustered by year \times department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

Linear regressions will not necessarily provide an unbiased estimate of the magnitude of the discontinuity if the true underlying functional form is not linear. Columns (3) through (8) explore robustness to specifying the RD using a variety of functional forms. These columns estimate the specification using quadratic, cubic and quartic RD polynomials, respectively. I observe that for investment the impact is robust to all the specifications, with the coefficients statistically significant at either the 1% or 5% level. For total spending I also find that all the coefficients are statistically significant (at either the 5% or 10% level), and for current spending are all statistically insignificant. For total and capital expenditure the coefficients tend to increase somewhat in magnitude when higher order polynomials are used.

Although Table 1.2 provides robust evidence that public spending is higher when a new party is in power, it does not guarantee that the difference reflects local governments' decisions. Municipal expenditures are partly funded with resources collected by the central government and transferred to local governments, and by royalties from the extraction of natural resources (mainly oil, gas, and coal). Thus, it is possible that the observed difference in spending depends on these resources, over which local politicians do not have any control. To verify that higher spending by a new party government is mainly due to local politicians' decisions, I examine how the main sources of funds of municipalities (local taxes, central government transfers and royalties) are affected by the presence of a mayor from a new party. I present the results in panels (b) and (d) of Figure 1.4 and in Panel A of Table 1.3. Panel (b) of Figure 1.4 shows that local taxes are higher when a mayor from a new party is in office; for capital revenue I do not observe any significant discontinuity. Panel A of Table 1.3 verifies this graphical evidence by using the same specification as in Table 1.2. It also includes total revenue. We observe that local taxes of which the mayor is directly responsible are around 30% higher

when a new party is in power, with a corresponding (but less statistically significant) increase in total revenue. In contrast, the estimated coefficients for capital revenue are small and statistically insignificant.

FIGURE 1.4: Close new parties victories and revenue



Notes : This figure plots municipal public finances against the new party margin of victory, with a negative margin indicating a new party loss. The solid line plots predicted values from a local linear regression, with separate vote spread trends estimated on either side of the new party win-loss threshold. The bandwidth is chosen using the Imbens-Kalyanaraman bandwidth selection rule (Imbens and Kalyanaraman, 2009), as implemented in the Stata ado file named rdob.ado (available on Imbens' website).

TABLE 1.3: Close new party election and revenue

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A : Revenue								
Total revenue	0.043 (0.038)	0.054* (0.028)	0.038 (0.046)	0.057 (0.038)	0.075 (0.058)	0.071 (0.046)	0.120* (0.070)	0.086 (0.054)
R-squared	0.742	0.832	0.742	0.833	0.742	0.833	0.743	0.833
Observations	1482	1480	1482	1480	1482	1480	1482	1480
Tax revenue	0.309*** (0.077)	0.266*** (0.064)	0.298*** (0.088)	0.236*** (0.072)	0.233** (0.095)	0.211** (0.085)	0.214** (0.107)	0.196** (0.090)
R-squared	0.595	0.720	0.596	0.720	0.596	0.720	0.597	0.720
Observations	1500	1497	1500	1497	1500	1497	1500	1497
Capital revenue	0.040 (0.053)	0.066 (0.042)	0.061 (0.067)	0.101* (0.058)	0.082 (0.079)	0.093 (0.065)	0.063 (0.094)	0.045 (0.072)
R-squared	0.601	0.687	0.602	0.687	0.602	0.688	0.602	0.688
Observations	1497	1494	1497	1494	1497	1494	1497	1494
Panel B : Deficit								
Total deficit	0.004 (0.004)	0.004 (0.005)	0.003 (0.005)	0.003 (0.005)	-0.002 (0.008)	-0.003 (0.008)	0.000 (0.007)	-0.000 (0.007)
R-squared	0.043	0.051	0.043	0.052	0.045	0.054	0.045	0.054
Observations	1389	1387	1389	1387	1389	1387	1389	1387
Covariates	no	yes	no	yes	no	yes	no	yes
Polynomial	linear	linear	quadratic	quadratic	cubic	cubic	quartic	quartic

Notes : All columns report the coefficient on new party win (*Nwin*) from equation (1.14) when the respective characteristic is used as the dependent variable. Controls include population, proportion of urban population, percentage of households with unsatisfied basic needs, a dummy variable for an incumbent from another new party, the number of candidates in the election, surface area, population density, annual homicide rate, dummy variables for the presence of guerrilla and paramilitary forces, as well as fixed effects for department and year. Robust standard errors clustered by year \times department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

Finally, I examine the possibility that new parties run higher deficits. Panel B of Table 1.3 shows that the deficit of the municipalities is not affected by the presence of a new party in power (the estimated coefficients are all small and statistically insignificant). This is possibly due to the fact that Colombian local politicians face strong external constraints on debt issuance. Thus, I conclude that local taxes are the main source of funding for the higher spending, and that municipalities governed by new parties are responsible for this difference.

1.5.1 Additional Measures of Party Newness

Although all the political organizations that I classify as new have not won before in the respective municipality, some of them have participated before in a municipality's previous elections, or in elections in another municipality. It is reasonable to expect that voters have more information about the members of these new parties. As a result, I expect the mayors of new parties that have participated in previous elections to spend less when compared to mayors from new parties that have just entered the political competition.

To test this prediction, in this section I introduce four additional measures of party newness, all related to the participation of new parties in past elections. The first measure is a dummy variable equal to one if the new party has never participated before in the *same* municipality. The second measure is a dummy variable equal to one if the new party has never participated before in *any* municipality. The third and fourth are variables that measure the number of years since the first participation of the party in the same and any municipality.⁴⁰

40. For elections between 1988 and 1994, the data does not allow for the identification of all participating parties. However, as I argued in Section 4.1, this does not imply a significant loss, since the participation and success of non-traditional parties were not

Tables 1.4-1.7 report estimates on the size of government of these four measures of past participation. The dependent variable in all columns is capital spending. For comparison purposes, columns (1), (3) and (5) of all Tables report the baseline RD regression result from columns (1), (3) and (5) of Table 1.2. Column (2) of Tables 1.4 and 1.5 examines the effect of the first two measures, the dummy variables that distinguish between municipalities with close elections where a new party has never participated before in the same or any election and a new party with at least one participation in the past. New parties that have never participated before in any municipality are present in around 56% of the elections where new and old parties received the two highest vote shares, and new parties that have never participated before in the same municipality but that have participated before in other municipalities are present in around 38% of the same kind of elections. The specification includes the same terms as the baseline RD specification in equation (1.14), but now also interacts $Nwin$, $margic$, and $margvic \times Nwin$ with the first participation dummies. Columns (4) and (6) examine the robustness of the result using a variety of functional forms. As expected, the coefficient of the interaction term is positive and statistically significant at either the 5% or 10% level in almost all specifications. Additionally, the estimates indicate that the effect of close new party victories on capital spending is large for parties that have never participated before in any election in the same municipality, and extremely large for parties that have never participated before in any election in any municipality.

significant before the 1997 elections.

TABLE 1.4: Effect of first participation in same municipality

	Linear		Quadratic		Cubic	
	(1)	(2)	(3)	(4)	(5)	(6)
New party win	0.114*** (0.033)	-0.107 (0.093)	0.141*** (0.044)	-0.111 (0.109)	0.159*** (0.058)	-0.220 (0.161)
$Nwin \times$ dummy 1st participation		0.233** (0.102)		0.266** (0.120)		0.394** (0.169)
R-squared	0.828	0.829	0.828	0.829	0.828	0.829
Observations	1501	1501	1501	1501	1501	1501
First participation effect		0.127*** (0.034)		0.155*** (0.047)		0.174*** (0.061)

Notes : The dependent variable in all columns is capital spending. New party win is a dummy equal to one if a new party candidate won the election ($Nwin$). First participation is a dummy equal to one if the new party participated for the first time in any election occurred in the same municipality. Columns (1), (3) and (5) report the baseline RD regression result from columns (1), (3) and (5) of Table 1.2. Columns (2), (4) and (6) include interactions between the margin of victory terms and the first participation dummy. All columns included fixed effects for department and year, as well as baseline controls. Robust standard errors clustered by year \times department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

TABLE 1.5: Effect of first participation in any municipality

	Linear		Quadratic		Cubic	
	(1)	(2)	(3)	(4)	(5)	(6)
New party win	0.114*** (0.033)	0.026 (0.039)	0.141*** (0.045)	0.072 (0.049)	0.159*** (0.058)	0.067 (0.063)
$Nwin \times$ dummy 1st participation		0.160*** (0.059)		0.142* (0.078)		0.167 (0.102)
R-squared	0.828	0.829	0.828	0.830	0.828	0.831
Observations	1501	1501	1501	1501	1501	1501

Notes : The dependent variable in all columns is capital spending. New party win is a dummy equal to one if a new party candidate won the election ($Nwin$). First participation is a dummy equal to one if the new party participated for the first time in any election. Columns (1), (3) and (5) report the baseline RD regression result from columns (1), (3) and (5) of Table 1.2. Columns (2), (4) and (6) include interactions between the margin of victory terms and the first participation dummy. All columns included fixed effects for department and year, as well as baseline controls. Robust standard errors clustered by year \times department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

TABLE 1.6: Effect of years since first participation in same municipality

	Linear		Quadratic		Cubic	
	(1)	(2)	(3)	(4)	(5)	(6)
New party win	0.114*** (0.033)	0.111*** (0.032)	0.141*** (0.044)	0.142*** (0.045)	0.159*** (0.058)	0.148** (0.059)
$Nwin \times$ years since 1st partic		-0.057*** (0.019)		-0.050* (0.026)		-0.097*** (0.035)
R-squared	0.828	0.828	0.828	0.829	0.828	0.829
Observations	1501	1496	1501	1496	1501	1496

Notes : The dependent variable in all columns is capital spending. New party win is a dummy equal to one if a new party candidate won the election (*Nwin*). Years since first participation is a continuous variable measuring the number of years since the first participation of the new party in any election occurred in the same municipality. Columns (1), (3) and (5) report the baseline RD regression result from columns (1), (3) and (5) of Table 1.2. Columns (2), (4) and (6) include interactions between the margin of victory terms and the years since the first participation variable. All columns included fixed effects for department and year, as well as baseline controls. Robust standard errors clustered by year \times department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

TABLE 1.7: Effect of years since first participation in any municipality

	Linear		Quadratic		Cubic	
	(1)	(2)	(3)	(4)	(5)	(6)
New party win	0.114*** (0.033)	0.113*** (0.032)	0.141*** (0.044)	0.154*** (0.043)	0.159*** (0.058)	0.147*** (0.055)
$Nwin \times$ years since 1st partic		-0.025*** (0.008)		-0.016* (0.010)		-0.027** (0.013)
R-squared	0.828	0.829	0.828	0.830	0.828	0.831
Observations	1501	1501	1501	1501	1501	1501

Notes : The dependent variable in all columns is capital spending. New party win is a dummy equal to one if a new party candidate won the election ($Nwin$). Years since first participation is a continuous variable measuring the number of years since the first participation of the new party in any election. Columns (1), (3) and (5) report the baseline RD regression result from columns (1), (3) and (5) of Table 1.2. Columns (2), (4) and (6) include interactions between the margin of victory terms and the years since the first participation variable. All columns included fixed effects for department and year, as well as baseline controls. Robust standard errors clustered by year \times department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

Tables 1.6 and 1.7 examine the effect of the second and third measures, the number of years since the first participation of the new party in the same and in any municipality. For the elections where new and old parties received the two highest vote shares, the average age of the new parties is 2.9 years. The specification is the same as in Tables 1.4 and 1.5, but instead of a participation dummy variable, it interacts $Nwin$, $margic$, and $margvic \times Nwin$ with the years-since-last-participation variable. The estimates are also as expected. The coefficient of the interaction term has the expected sign (negative) and is statistically significant at either the 5% or 10% level in all specifications. Thus, a given increase in the newness of the party yields more public spending when a new party is in power. If more years since the first participation implies that the party is better known by the voters, then this finding provides additional evidence on the plausibility of the hypothesis proposed in Section 2.

1.5.2 New Parties and Municipal Transparency

In this section I use data on municipal transparency to analyze whether there are significant differences between municipalities governed by mayors from traditional and new parties. As a measure of transparency, I use the *Municipal Transparency Index* (MTI), constructed by *Transparencia por Colombia*, the local chapter of *Transparency International*. This index evaluates whether the actions taken by the municipal authorities improved the access to information by voters, the efficacy of punishment for the faults of public servants, and the controls established in order to pursue the municipal goals.⁴¹ The index ranges from 1 to 100, with greater values indicating greater levels of transparency. Table 1.8 reports the estimated effect of having a mayor from a new party on this measure of municipal transparency. The dependent variable in all columns is the MTI, and the specification includes the same terms as the baseline specification in equation (1.14). The estimated effect is not significant at either, 5% or 1% level, in all specifications.

Since we expect mayors extracting higher rents to have weaker incentives to be transparent, the MTI index can be thought of as a proxy of political rents. According to this interpretation, my empirical analysis suggests that on average new party mayors do not extract higher rents. As discussed at the end of Section 2, this finding is coherent with the model if we assume that ξ for new party mayors is lower. This seems to be a reasonable assumption. As noted in Section 3, new parties were created as a response to a series of corruption scandals affecting prominent figures of the traditional

41. The data and a more detailed description of this index (in spanish *Indice the Transparencia Municipal* (ITM)) can be consulted at <http://www.transparenciacolombia.org.co/>. This measure has an important limitation : it only exists for a limited number of municipalities. For the periods 2004-2007 and 2008-2011 there is data for 254 and 148 municipalities, respectively. Thus, the empirical results in this section should be taken with some caution.

TABLE 1.8: Close new party election and municipal transparency index

	(1)	(2)	(3)	(4)	(5)	(6)
Transparency Index	3.074 (2.961)	4.528* (2.397)	-0.774 (3.197)	-0.366 (2.817)	1.386 (3.608)	2.091 (3.034)
R-squared	0.305	0.429	0.326	0.451	0.332	0.455
Observations	216	215	216	215	216	215
Covariates	no	yes	no	yes	no	yes
Polynomial	linear	linear	quadratic	quadratic	cubic	cubic

Notes : All columns report the coefficient on new party win (*Nwin*) from equation (1.14) when the Municipal Transparency Index (MTI) is used as the dependent variable. All columns included fixed effects for department and year. Robust standard errors clustered by year \times department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

parties. Gutierrez (2007, p. 404) shows for instance how in the nineties these corruption scandals reached unprecedented levels, and occurred at all levels of government (from municipal deputies to the president of the republic). In addition, he details how most of candidates running under new party labels took advantage of this situation by denouncing the politicians from the two traditional parties as representatives of an old and corrupt way of doing politics, and emphasized their independence from the traditional political machines (see Gutierrez (2007, p. 405)). In particular, he shows how these candidates emphasized that they did not have the disposition, skills or connections required to this kind of practices (see Gutierrez (2007, p. 402)). Thus, if candidates from new parties are expected to be more honest, and assuming that mayors extracting higher rents have weaker incentives to be transparent, then, consistently with the of model of Section 2, there should not be a significant difference in the actions taken by the municipal authorities in order to increase the transparency of their governments.

1.5.3 Other Mechanisms

Finally, to shed further light on the plausibility of the model, in this section I check whether other mechanisms could explain why new parties spend more.

First, I investigate whether my result arises because new parties are mainly from one side of the political spectrum. Assessing the ideology of new parties is a daunting task. One possibility to obtain information about a new party's ideology is to look at the ideology of the main competitor. Although this information is indirect because it does not say whether a new party is challenging a traditional party from the left or the right, it can inform about whether new party ideology plays a role in the increase in public expenditures in case new parties are challenging *both* traditional parties from one of these sides. I therefore introduce a dummy variable that takes a value of one if there is a close election between a new party and the Liberal party (the traditional center-left party). Liberals were present in 60% of the elections where new and old parties received the two highest vote shares. Column (2) of Table 1.9 examines this specification. The dependent variable is capital spending, and the coefficients are estimated using a linear functional form from equation (1.14). Specifically, the specification includes the same terms as the baseline RD specification in equation (1.14), but now also interacts $Nwin$, $margic$, and $margvic \times Nwin$ with a Liberal party opponent dummy. For comparison purposes, column (1) of Table 1.9 reports the baseline result from column (2) of Table 1.2. I observe that the estimated effect of a new party mayor taking office, relative to a non-new party mayor taking office, is large and statistically significant regardless of whether the opponent is from the Liberal party.

Related with the possible effect of ideology on spending, I also provide

evidence that the two traditional parties do not significantly differ, at least when looking at fiscal outcomes. Column (4) of Table 1.9 examines close elections where the Liberal and Conservative parties received the two highest vote shares. The new-party-win dummy variable in the RD specification is replaced by a Liberal-win dummy. As expected given the results in column (2), the estimated effect is statistically insignificant. This suggests that when looking at fiscal outcomes, the main divide in Colombian politics is between new and traditional parties, not between the two traditional parties. Most importantly, this could provide additional evidence that ideology does not seem to have much effect on municipal government spending, and is consistent with the hypothesis that local battles are probably fought over competence or corruption.

Finally, I examine the possibility that new parties spend more because they have a smaller majority on municipal councils. Column (3) of Table 1.9 examines a specification that distinguishes between whether the mayor's party holds a majority on the local council, which occurred in 51% of the cases in my sample. I do not observe any statistically significant difference. This finding is consistent with the hypothesis that it is the mayor's party (and not the local council or the relative strength of the mayor's party in the local council) that is mainly responsible for the city's budget. This finding also helps me to exclude a possible alternative explanation based on the weakness of the new parties in local councils and their need to form coalitions to pass their budget.⁴²

42. An explanation of why public spending is higher in coalition governments, and some empirical evidence for 50 democracies, can be found in Persson, Roland, and Tabellini (2007).

TABLE 1.9: Other Mechanisms

	Elections involving new parties			Alternative sample
	Baseline	New vs Liberal	Majority in Council	Liberal vs Conservative
	(1)	(2)	(3)	(4)
New party win	0.114*** (0.033)	0.139*** (0.047)	0.094** (0.037)	
Nwin × Liberal opponent		-0.044 (0.059)		
Nwin × majority in Council			0.078 (0.069)	
Liberal win				-0.038 (0.057)
R-squared	0.828	0.829	0.829	0.868
Observations	1501	1501	1501	464
Liberal opponent effect		0.095** (0.042)		
New party majority effect			0.172*** (0.056)	

Notes : The dependent variable in all columns is capital spending. New party win is a dummy equal to one if a new party candidate won the election (*Nwin*). Liberal win is a dummy equal to one if a Liberal candidate won the election, Liberal opponent is a dummy equal to one if the new party candidate faced a Liberal opponent, majority in council is a dummy equal to one if the party controlling the mayorship holds a majority in the local council. All columns are estimated using a linear functional form from equation (1.14). All columns included fixed effects for department and year, as well as baseline controls. Column (2) also includes interactions between the margin of victory terms and the Liberal opponent dummy, and Column (3) includes interactions between the margin of victory terms and the Majority in council dummy. Columns (1) through (3) limit the sample to municipalities where a new party candidate was the winner or runner-up and Column (4) limits the sample to municipalities where Liberal and Conservative candidates received the two highest vote shares. Robust standard errors clustered by year×department are reported in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

1.6 Conclusion

This study examined how the presence of politicians from new parties affects public finance outcomes. The study focuses on Colombian municipalities, where new parties have recently been competing against two well-defined old parties. Regression discontinuity estimates show that the size of government (measured in terms of public spending and tax revenue) is higher in municipalities governed by a mayor from a new party. Additionally, analyses using information about local politics and the features of the new parties show that it is the newness of these parties that plausibly causes the difference. As a possible mechanism, the study also proposes a career-concerns model where more *ex ante* uncertainty about the honesty of the incumbent reduces the electoral cost of increasing the size of government. Since it is expected that voters have less knowledge about members of new parties than members of traditional parties, this could explain why new party mayors spend relatively more.

Several opportunities exist for future research. First, it has not been discussed how the larger governments chosen by politicians from new parties affect social and economic outcomes. One could also examine the effect of new parties on a wider set of policy outcome variables than the size of government, including new parties' effects on long-run policy outcomes. Finally, there is the question of why new parties are formed and, more generally, how to explain the stability (and change) of party systems.

Chapitre 2

External threats, political stability and fiscal capacity

2.1 Introduction

There is now a large and growing literature on the impact of war on state-building.¹ Much of this literature builds on Charles Tilly's famous phrase "war made the state and the state made war" (Tilly, 1975, p. 42), or, put in economic terms, "war placed a premium on sources of taxation and created incentives for governments to invest in revenue-raising institutions" (Besley and Persson, 2009). In this literature, in particular, in an important series of papers trying to unify some essential issues on state-building (Besley and Persson, 2008, 2009, 2010, 2011, from now on *B&P*), the significance of war relies on the assumption that threats from external enemies generate com-

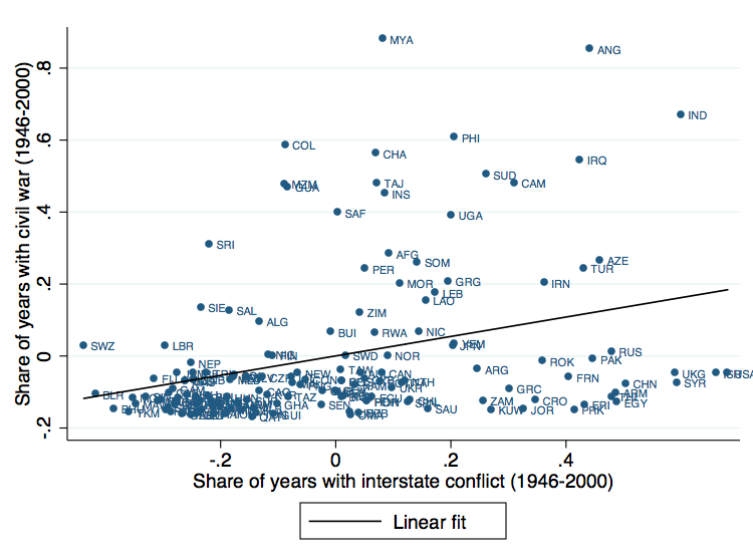
1. See Tilly (1975, 1990) and more recently, the series of papers by Besley and Persson (2008, 2009, 2010, 2011). See also Dincecco (2011), Dincecco and Prado (2012), Hoffman and Rosenthal (1997), Hoffman (2012), O'Brien and Yun-Casalilla (2012) and Gennaioli and Voth (2013) for the case of Europe, and Lopez-Alves (2000), Centeno (2002) and Thies (2005) for the case of Latin America.

mon interests among groups in society, leading to larger investments in state capacity.

The idea that interstate warfare has a positive effect on state-building because of its contribution to the provision of a public good (e.g. national defense) has helped to explain many crucial fiscal innovations introduced in Europe during the period 1600-1800s.² However, important issues remain. Gennaioli and Voth (2013) have shown for instance that during the period of initial European state building interstate warfare, rather than a common-interest public good, was a private good for princes in pursuit of glory and personal power. Pincus and Robinson (2013) have also argued against the application of this thesis to the British State, noting that critical elements of state building (as the monopoly of violence or an internal fiscal system) were not associated with inter-state warfare but rather were either uncorrelated with warfare or were associated with civil war.

2. See Hoffman and Rosenthal (1997), Hoffman (2012), Dincecco (2011), O'Brien and Yun-Casalilla (2012)

FIGURE 2.1: Civil war and interstate conflicts (partial correlation)



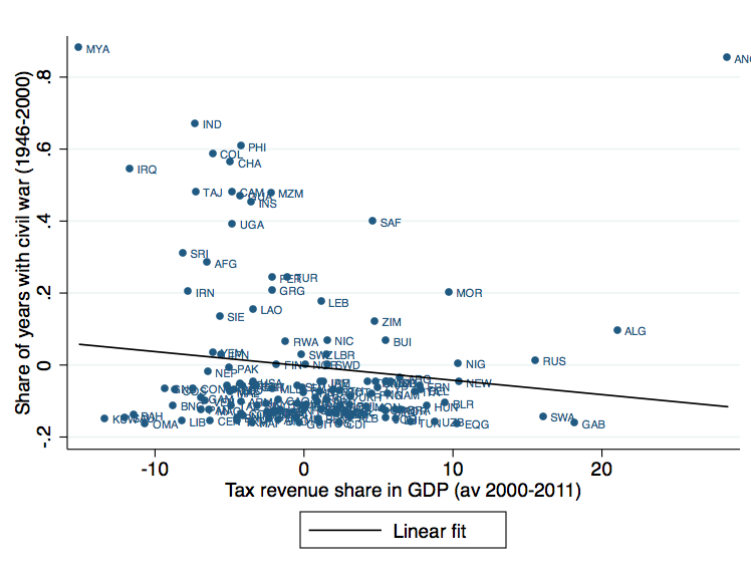
Sources : for civil war, UCDP-PRIO ; for Interstate Conflict, Correlates of War (COW)

If we extend the hypothesis to other regions and more recent times, the idea that interstate warfare generates common interests among groups seems even less plausible. Though in last century a large number of countries experienced external wars, many of these countries, instead of undergoing investment in revenue-raising institutions, were also affected by factional politics that often drove them to destructive civil wars. Figure 2.1 plots the partial correlation between civil war and interstate conflict by plotting the share of years with civil war in the period 1946-2000 versus the share of years with interstate disputes in the same period.³ The figure shows a significant positive correlation, meaning that countries that experienced more interstate disputes also experienced more civil wars. Figure 2.2 plots the partial corre-

3. The data on civil wars is from the Uppsala Conflict Data Program (UCDP/PRIO), and on interstate disputes from the Correlates of War project (COW). For a description of these datasets, see Section 3.

lation between civil wars and tax revenue share in GDP from 2000 onward (that I use as a proxy of state capacity).⁴ The figure shows a negative correlation, suggesting that countries that experienced more civil wars in the past tend to have less state capacity today.

FIGURE 2.2: Civil war and fiscal capacity



Sources : for civil war, UCDP-PRIO, for fiscal capacity, IMF

Thus, if external conflicts are correlated with internal divisions (as Figure 2.1 suggests), and if more exposure to civil wars in the past is associated with less state capacity today (as Figure 2.2 suggests), then the effect of interstate conflicts on state building can not be unambiguously positive. How, then, to identify the effect? One alternative is to assume that external and internal disputes are two independent types of conflicts, with opposing effects on the development of state capacity : while external conflicts would imply unity

4. The data on tax revenue is from the International Monetary Fund (IMF). See Section 3.

and consensus (which facilitates investment in state capacity), internal wars would be divisive and destructive (with a negative effect on state building). If this is the case, a natural way to proceed is establishing some conditions under which one of the two conflicts dominates.⁵

Despite its relevance, this option is based on a very strong assumption : that external and internal conflicts are independent or unrelated. However, Figure 2.1 showed a pattern that might suggest otherwise. If we look at each interstate dispute and civil war in detail, more doubts about the likelihood of this option emerge. During the period 1946-2000, 57% of the countries that experienced an interstate dispute also experienced a civil war. Also in 42% of the cases, a civil war occurred the same year or within a five years window than an interstate conflict. Thus the coincidence between inter and intra state conflicts seems to be much less than an accident. Abundant literature on conflict has also documented clear examples of relations between civil wars and conflicts between states.⁶

This chapter develops an alternative explanation of the impact of interstate conflict on state capacity based on a potential close relation between interstate conflicts and civil wars. The chapter focuses on fiscal capacity, conceived as the capacity of the states to raise taxes, and uses *B&P*'s basic framework. However, this framework is extended and modified in several dimensions. An important difference is that what matters in case of war is not

5. This is *B&P*'s approach. See in particular Besley and Persson (2008). This is also the argument proposed by Centeno (2002) to explain the low level of state capacity in Latin America : Latin America's political violence has occurred largely within rather than between states, and has mainly left some form of fiscal crisis as states have failed to adjust to the extra expenditures. See Lopez-Alves (2000) and Thies (2005) for compatible arguments.

6. See for instance Elbadawi and Sambanis (2000); Gleditsch and Beardsley (2004); Hegre and Sambanis (2006); Gleditsch (2007); Salehyan (2008); Gleditsch, Salehyan, and Schultz (2008); Cunningham (2010); Salehyan, Gleditsch, and Cunningham (2011); Morelli and Pischedda (2013).

the value of a common-interest public good, but the share of transfers (product of taxing residents) that each group gets when the interstate conflict is resolved.⁷ In the explanation I suppose that a government might lose power for two reasons : because it faces a threat from a foreign country, and also because of a threat from an internal opposition. Crucially, I consider the possibility that the domestic opposition might have a link with the foreign country. This link essentially means that the opposition might be better off under a foreign administration. Think for instance of an opposition that shares the same ethnicity or ideology of the foreign country, because the opposition members mostly live in a region at the border.⁸ For this opposition it is not clear who is better : if the current government, led by people from the same country but who are ethnically or ideologically very different, or a foreign administration, led by people from other country, but with who they share the same ethnicity or ideology.

In the model, the opposition has to decide whether to initiate a civil war, knowing that a civil war may also weaken the country against an external threat, and that, in case of interstate conflict, his chances of getting power through a civil war increase. My first main result establishes some conditions under which an external threat increases or decreases fiscal capacity. I find

7. This focus, besides differentiating the argument from *BEP*'s, approaches it to Herbst (2000)'s, who argued, for the case of Africa, that wars (of any kind) are not fought with the aim of territorial conquest, but, essentially, in search of the control of populations.

8. An example could be Mobutu Sese Seko's regime, and its overthrown by Laurent-Désiré Kabila's ADFL, in today's Democratic Republic of Congo (DRC). Mobutu's internal opposition would not have been strong enough without Rwanda's sympathy, and Rwanda's invasion would not have been successful without the support of Mobutu's internal opposition. Both types of support were sustained by the ethnic ties between the Tutsis in Rwanda and the RDC (see Thom, 1999). Another example could be Uganda during Amin's regime in the 1970's; among all the threats this regime faced during its existence, the most important being that led by Uganda's former ruler, who lived in exile in Tanzania but maintained important links with Amin's internal opposition (see Ravenhill (1974, p.247) and Acheson-Brown (2001, p. 3)).

that when the opposition and the external country are closely tied (possibly because they are geographically close), the opposition and foreign country's actions are strategic complements : the external threat makes the opposition more willing to fight, increasing the probability of civil war. This raises instability and makes the incumbent more short-sighted, leading to smaller investment in fiscal capacity. And when the opposition and the foreign country are not closely tied (because, for instance, the geographical distance is large) opposition and foreign country's actions are strategic substitutes : the external threat makes the opposition less belligerent, increases the political life of the incumbent government and makes him more willing to invest in fiscal capacity.

My second main result specifies the relation between political stability and fiscal capacity. Interestingly, I find that while less political stability translates into less investment, more stability does not automatically imply more fiscal capacity. Whether or not they move in the same direction depends on how cohesive are institutions. The intuition is based on the idea that for institutions sufficiently cohesive, the fact of losing power against the domestic opposition is not too bad for the incumbent, so the gains associated to his support are not very high. If an external threat increases the probability that the incumbent continues in power in the future (what I call political stability) because the incumbent gains support from the opposition, and if institutions are sufficiently cohesive, the gains from this greater stability might not compensate the very bad outcomes from a possible foreign administration (that can be still sufficiently likely). Thus, more stability does not translate into more state-building. As far as I know this result is new in the literature, contributing to the important question about whether more political stability leads to better public policies (see Acemoglu, Golosov, and Tsyvinski, 2011). This chapter provides a novel mechanism through which less power

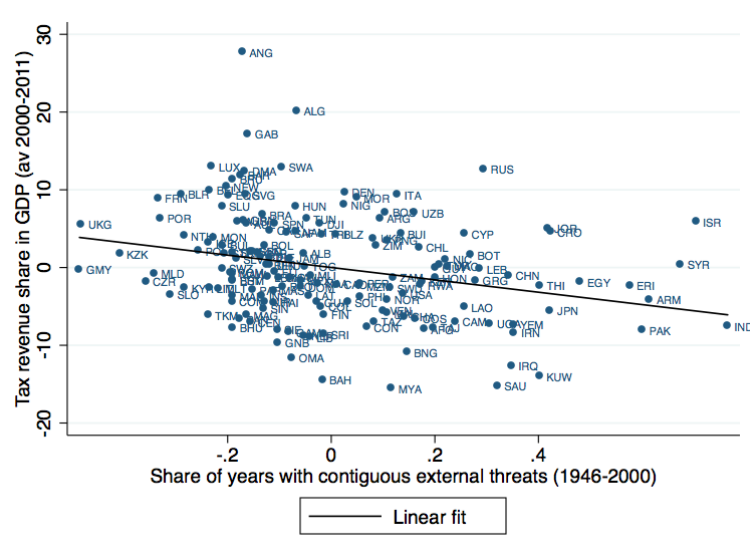
switches could not be state-building.

In the last part of the chapter I present some motivating empirical evidence based on some cross-country correlations. My objective in this part is to assess whether some basic correlations in the data are consistent with the theory. Figures 2.3 and 2.4 illustrate the basic intuition. They show some partial correlations between the tax revenue share in GDP from 2000 onward (that I use as a proxy of fiscal capacity), and the share of the years between 1946 and 2000 that a country was involved in an interstate conflict (that I use as a proxy for the past exposure to external threats).⁹ Provided an expected ambiguous effect of external threat on fiscal capacity (because the effect would depend on the strength of the link between the domestic opposition and external enemy), Figures 2.3 and 2.4 show that if we separate between the external threats coming from contiguous countries, and those from non contiguous enemies, a pattern seems to emerge. Figure 2.3 shows that those countries that during more years experienced external threats from contiguous countries tend to be also those countries with less fiscal capacity. Figure 2.4 shows that the opposite occurs if we look at those threats from non contiguous countries. This pattern is coherent with the first main result if the geographical proximity between two countries is positively correlated with the strength of the links between a country's opposition and its main foreign enemy.

As previously mentioned, this chapter is related to the literature studying the impact of conflict on state-building, and uses *B&P*'s framework. However, also as stated before, this framework is extended in several dimensions. In particular, it is not assumed that interstate warfare is necessarily a common-interest public good, and, most importantly, a link between internal

9. The data on tax revenue is from the International Monetary Fund (IMF), and on interstate disputes from COW. For a description of these datasets, see Section 3.

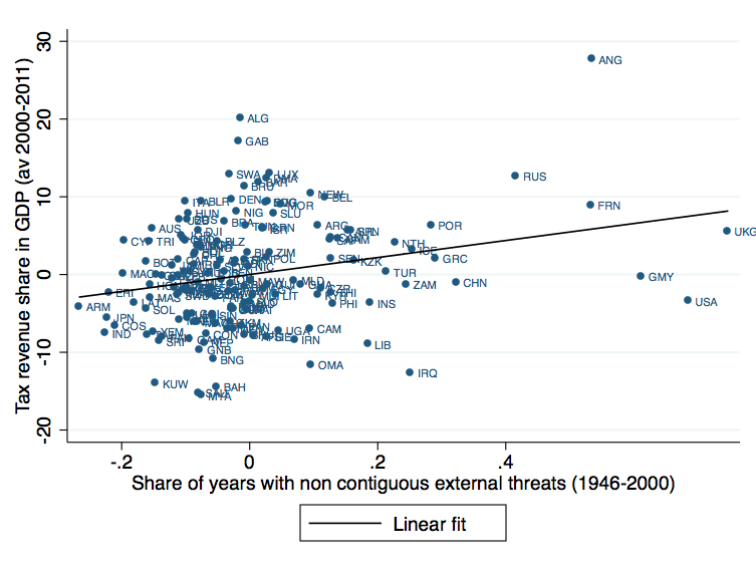
FIGURE 2.3: Interstate disputes with contiguous enemies and fiscal capacity (partial correlation)



Sources : for fiscal capacity, IMF ; for Interstate Conflict, Correlates of War (COW)

and external conflicts is introduced. In this second aspect, this chapter differs from both Besley and Persson (2008) and Gennaioli and Voth (2013), the two closest references. Besley and Persson (2008) also study the impact of war on fiscal capacity, and focus on the relation between internal and external conflicts. Through a model they argue that investment in fiscal capacity is reduced by a greater risk of future internal conflict, and raised by greater risk if future external conflict. As external conflict can also be in current time, which reduces investment in state capacity, they argue that the probability of external conflict has an ambiguous effect. Despite the coincidences, their model and results crucially depend on the assumption that internal and external conflicts are independent. In particular, they assume that internal conflicts occur only when there is no external conflict. As stated before, I

FIGURE 2.4: Interstate disputes with non-contiguous enemies and fiscal capacity (partial correlation)



Sources : for fiscal capacity, IMF ; for Interstate Conflict, Correlates of War (COW)

remove this assumption, and I identify some testable conditions under which an external conflict has a possible or negative effect on fiscal capacity.

Gennaioli and Voth (2013) also study the impact of war on fiscal capacity. As already mentioned, they focus on the initial European state building (1600-1800), and unlike Besley and Persson (2008), they do not assume that interstate warfare is necessarily a common-interest public good. By proposing a model and providing some empirical evidence, they argue that war's impact on state capacity (that they conceive as a centralized revenue collection system) depends on the cost of war and on the initial level of political fragmentation. In their model war does not necessarily lead to state building when the costs of war are sufficiently low and fragmentation is sufficiently high : in this case it is better for rulers not to invest in centralization because

it is expensive, they would have more to lose (higher fiscal revenues) in case of defeat, and war does not require such great investments. Although Gennaioli and Voth (2013)'s argument has some similarities to what is proposed here, there is one essential difference. In their model the domestic groups are not related with other groups in other countries. As a result, those groups that form a centralized country behave as a unity when facing a foreign threat, and war is still a sort of common interest public good in the sense that the losses are equally distributed when the country loses the war. In the model here proposed the groups that form the country do not share *a priori* the same negative view about the possibility of a foreign administration, and act accordingly, reinforcing or decreasing the impact of the external threat.

The outline of the chapter is as follows. Section 2.2 presents the model. Section 2.3 presents some additional empirical evidence, and Section 2.4 concludes.

2.2 Model

In this section I develop a model that helps to understand how violent disputes (internal and external) affect the incentive of incumbents to invest in fiscal capacity. With this model I illustrate a number of new mechanisms that appear to be important in understanding the links between conflict and investment in fiscal capacity.

There are two countries, H (home) and F (foreign) and two time periods, $s = 1, 2$. Country H is divided into two groups, A and B , each of which makes up half of the population. F is homogeneous, and in both periods is ruled by the same group, also denoted by F . The analysis focuses on H . However F will be crucial for the analysis : through the threat of an intervention F decisively affects the decision making in H .

At the beginning of period 1 one of the domestic groups in H (A or B), holds power and decides the period-1 set of policies. These policies consist of a uniform tax rate on income, t_1 , only applied to individuals from groups A and B , and a set of group-specific transfers, $\mathbf{r}_1 = \{r_1^A, r_1^B, r_1^F\}$, awarded to everyone. The incumbent group in H also determines, through investment, the period-2 stock of fiscal capacity, τ_2 . Let $I_1 \in \{A, B\}$ be the incumbent group in period 1, and $O_1 \in \{A, B\}$ its domestic opposition. After the period-1 policies and investment are chosen, O_1 decides whether or not to contest I_1 's leadership by triggering a civil war. Irrespectively of the existence of such a war, an interstate conflict between F and H occurs with probability α . The outcome of the interstate conflict, the domestic dispute, and/or the elections determine the incumbent for the second period, denoted by $I_2 \in \{A, B, F\}$. The case $I_2 = F$ occurs when F wins the interstate conflict, and the consequence is the establishment of a foreign administration of H by F . In the second period, I_2 decides a new set of policies t_2 and \mathbf{r}_2 . Since there are only two periods, there is no investment in fiscal capacity in this period.

Turnover depends on whether O_1 triggers a civil war in the shadow of an external conflict with F . Let's call ϕ_z^{xy} the probability that the group $z \in \{I_1, O_1, F\}$ is in power in period 2 conditional on the existence of an external and/or internal war (or peace), where $x = a$ means external war, $x = p$ external peace, $y = w$ internal war and $y = p$ internal peace.¹⁰ Note that ϕ_O^{xp} denotes the probability that O_1 comes to power peacefully (i.e. through elections), and ϕ_O^{xw} is the probability that O_1 wins the civil war he has previously triggered (both conditional on $x \in \{a, p\}$). I assume that F can come to power in H only violently, by winning an interstate conflict,

10. For instance ϕ_I^{pw} represents the probability that I_1 continues in power in period 2 conditional on external peace and civil war, and ϕ_F^{ap} is the probability that F is power in period 2 in case of external conflict and domestic peace. To simplify the notation I write ϕ_I^{xy} instead of $\phi_{I_1}^{xy}$ and ϕ_O^{xy} instead of $\phi_{O_1}^{xy}$.

which implies that $\phi_F^{pw} = \phi_F^{pp} = 0$.

Timing

The timing of the game is as follows.

- (1) Nature decides the initial stock of fiscal capacity τ_1 , and $I_1 \in \{A, B\}$.
- (2) I_1 chooses a set of period-1 policies $\{t_1, \mathbf{r}_1 = \{r_1^A, r_1^B, r_1^F\}\}$ and determines (through investment) the period-2 stock of fiscal capacity τ_2 .
- (3) O_1 decides whether or not to start a civil war, and, at the same time, an interstate conflict between F and H occurs with probability α .

When in 3 :

- there was an interstate conflict and a civil war, I_1 remains in power with prob. ϕ_I^{aw} , O_1 is the new incumbent with prob. ϕ_O^{aw} , and F establishes a foreign administration with prob. ϕ_F^{aw} , with $\phi_I^{aw} + \phi_O^{aw} + \phi_F^{aw} = 1$
 - there was an interstate conflict but not a civil war, I_1 remains in office with prob. ϕ_I^{ap} , O_1 wins the elections with prob. ϕ_O^{ap} and F establishes a foreign administration with prob. ϕ_F^{ap} , with $\phi_I^{ap} + \phi_O^{ap} + \phi_F^{ap} = 1$.
 - there was not an interstate conflict but there was a civil war, I_1 remains in office with prob. ϕ_I^{pw} and O_1 is the new incumbent with prob. ϕ_O^{pw} , with $\phi_I^{pw} + \phi_O^{pw} = 1$.
 - there was not an interstate conflict nor a civil war, I_1 remains in office with prob. ϕ_I^{pp} and O_1 wins the elections with prob. ϕ_O^{pp} , with $\phi_I^{pp} + \phi_O^{pp} = 1$.
- (4) $I_2 \in \{A, B, F\}$ chooses period-2 policy $\{t_2, \mathbf{r}_2 = \{r_2^A, r_2^B, r_2^F\}\}$

Preferences

The utility function of a typical individual of group $J \in \{A, B\}$ in period s is

$$u_s^J = (1 - t_s)w + r_s^J \quad (2.1)$$

where w is an exogenous income, t_s is the income tax and r_s^J is the transfer. The utility function of a typical individual of group F in period s is

$$u_s^F = r_s^F \quad (2.2)$$

where r_s^J is the transfer. Note that since F is a foreign group, members of F are not taxed.

Fiscal Capacity and Government Budget

The tax income rate t_s is constrained by the existing fiscal capacity τ_s , such that $t_s \leq \tau_s$. In addition, τ_s , initially set to τ_1 , augments by non negative investment in period 1, with an increasing convex costs $C(\tau_2 - \tau_1)$ where $C_\tau(0) = 0$. Finally, total population size in both H and F is normalized to one. Thus, the government budget constraint is

$$\text{Budget constraint} \equiv \begin{cases} t_1 w = C(\tau_2 - \tau_1) + \frac{r_1^A + r_1^B}{2} + r_1^F & \text{in period } s = 1 \\ t_2 w = \frac{r_2^A + r_2^B}{2} + r_2^F & \text{in period } s = 2 \end{cases} \quad (2.3)$$

Allocations of Transfers

As in $B\mathcal{E}P$, I assume that the incumbent group must give a fixed share to the opposition for any unit of transfers he awards to his own group. I

distinguish two cases, one in which the incumbent is one of the domestic groups, and other with F as incumbent. For the first case, I assume that

$$r_s^{O_s} = \sigma r_s^{I_s} \quad (2.4)$$

where $I_s, O_s \in \{A, B\}$. For the second case, when F holds power in period 2, I assume that

$$r_2^{O_1} = \sigma' r_2^F \quad (2.5)$$

In both (2.4) and (2.5), σ and $\sigma' \in [0, 1]$. The expression in (2.4) corresponds to the case the incumbent is a domestic group, and basically states that the incumbent, I_s , must give the fixed share σ of its rents to the domestic opposition, O_s . It can be interpreted as a requirement of opposition protection, measured for instance by the existence of checks and balances on the executive. According to this interpretation, $\sigma = 1$ would mean very high executive constraints, and $\sigma = 0$ that these constraints do not exist.

The expression in (2.5) also implies that the incumbent, in this case F , must give a fixed share of its rents to the domestic opposition. However, since F 's opposition consists of two groups (A and B), (2.5) states that F must give a share of its rents only to O_1 , the group that was in the opposition in period 1. The intuition behind (2.5) is as follows. First note that since F is a foreign power, the existing domestic rules of opposition protection (as (2.4)) do not necessarily apply to him. In particular, it is reasonable to expect that the share of rents that F must give to the opposition can be group specific. Second, since H is governed by I_1 when the interstate conflict between F and H takes place, F might see I_1 as its main enemy. Thus, in case of a foreign administration, we can expect that I_1 is hit the hardest. This implies that the share of rents that F must give to O_1 must be at least as big as what he must give to I_1 . This situation is evident if, as suggested in the introduction, O_1

and F share the same ethnicity or ideology, and, in general, it will depend on how closely linked are F and O_1 . The expression in (2.5) intends to capture this idea, and the parameter σ' can be seen as measuring the strength of such link. According to this interpretation, $\sigma' = 1$ would mean that F and O_1 are closely linked, and $\sigma' = 0$ that such link does not exist.¹¹

Finally, I assume that σ' is known by O_1 and F , but not by I_1 , who only knows that it is uniformly distributed in the interval $[0, \frac{1}{\psi}]$, with $\psi > 0$ and mean denoted by $\bar{\sigma}$.

Additional Assumptions

In the text, I assume that the following inequalities hold :

- Given an interstate conflict, F is more likely to hold power if there is a civil war :

$$\phi_F^{aw} \geq \phi_F^{ap} \quad (2.6)$$

- Given a civil war, O_1 is more likely to hold power if there is interstate conflict :

$$\phi_O^{aw} \geq \phi_O^{pw} \quad (2.7)$$

- Absent civil war, O_1 is more likely to hold power if there is no interstate conflict :

$$\phi_O^{pp} \geq \phi_O^{ap} \quad (2.8)$$

Expressions in (2.6) and (2.7) are intuitive, and imply that both kinds of conflicts (internal and external) reinforce each other : in terms of the probability of victory, it is a good idea for both O_1 and F to be more aggressive when their common enemy (I_1) is already involved in a conflict.¹² The ex-

11. Note that the fact that I do not include a constraint on the share of its rents that F must give to I_1 implies that these two groups are not linked, which is what we would expect from main enemies.

12. Off course this does not mean that O_1 will always prefer to attack I_1 in case there is also a interstate conflict ; this decision will depend on the consequences of an eventual

pression in (2.8) corresponds to the idea that leaders are more likely to be reelected in case of international conflict, either because war provides them unique opportunities to deal with their opposition (Chiozza and Goemans, 2004), or because they engage in a “gamble for resurrection” (Downs and Rocke, 1994).

In order to simplify the notation, let’s define

$$\Delta\phi_F \equiv \phi_F^{aw} - \phi_F^{ap} \quad (2.9)$$

$$\Delta\phi_y^x \equiv \phi_y^{xw} - \phi_y^{xp} \quad (2.10)$$

for $x \in \{a, p\}$ and $y \in \{I, O\}$. Note that (2.6) implies that $\Delta\phi_F \geq 0$, and (2.7) and (2.8) imply that $\Delta\phi_O^a - \Delta\phi_O^p \geq 0$.

2.2.1 Analysis of the Model

In this section I solve the game. As usual, this will be done by backward induction. I start with a given stock of fiscal capacity, and then I characterize policy choices. After this characterization, I go to the earlier stages of the game, where I determine O_1 ’s decision about whether or not to start a civil war (stage 3), and I_1 ’s decision about the period-2 stock of fiscal capacity (stage 2). Between stages 3 and 2, I include a subsection in which I study the impact of war on political stability; this allows me to present the main results of the chapter (Propositions 2 and 3) in a more concise way.

Policymaking in period 2 (stage 4)

I study the optimal policy chosen by the incumbent in period 2 (stage 4). We have two cases : one in which the incumbent is one of the domestic

foreign administration.

groups (i.e. $I_2 \in \{A, B\}$), and other in which the incumbent is the foreign power (i.e. $I_2 = F$).

For $I_2 \in \{A, B\}$, I_2 chooses $\{t_2, \mathbf{r}_2 = \{r_2^A, r_2^B, r_2^F\}\}$ to maximize (2.1) subject to (2.3), (2.4) and $t_2 \leq \tau_2$. It is easy to see that we have a corner solution with $t_2 = \tau_2$, $r_2^F = 0$, $r_2^{O_2} = \sigma r_2^{I_2}$ and

$$r_2^{I_2} = 2(1 + \sigma)^{-1} \tau_2 w \quad (2.11)$$

For $I_2 = F$, F chooses $\{t_2, \mathbf{r}_2 = \{r_2^A, r_2^B, r_2^F\}\}$ to maximize (2.2) subject to $t_2 \leq \tau_2$, (2.3) and (2.5). In this case we have that $t_2 = \tau_2$, $r_2^{I_1} = 0$, $r_2^{O_1} = \sigma' r_2^F$, and

$$r_2^F = 2\tau_2 w (2 + \sigma')^{-1} \quad (2.12)$$

Civil war (stage 3)

Now I study O_1 's decision about whether or not to start a civil war. First, I compute O_1 's period-2 indirect utility for the cases of a domestic incumbent (i.e. $I_2 \in \{A, B\}$) and a foreign administration (i.e. $I_2 = F$). Then, I compute O_1 's expected (indirect) utility in case of triggering or not a civil war. Finally, I compare the two expressions and establish the conditions under which O_1 chooses war (or peace).

For $I_2 \in \{A, B\}$, replacing (2.11) and $r_2^{O_2} = \sigma r_2^{I_2}$ in (2.1), we have that :

- O_1 's period-2 indirect utility in case O_1 is the incumbent in period 2 (i.e. $I_2 = O_1$) is

$$W^{O_1}(\tau_2, \kappa^I) = (1 - \tau_2)w + \kappa^I \tau_2 w \quad (2.13)$$

where $\kappa^I = 2(1 + \sigma)^{-1}$.

- O_1 's period-2 indirect utility in case I_1 is the incumbent in period 2

(i.e. $I_2 = I_1$) is

$$W^{O_1}(\tau_2, \kappa^O) = (1 - \tau_2)w + \kappa^O \tau_2 w \quad (2.14)$$

where $\kappa^O = 2\sigma(1 + \sigma)^{-1}$.

For $I_2 = F$, replacing (2.12) in $r_2^{O_1} = \sigma' r_2^F$, and the result in (2.1), we have that

□ O_1 's period-2 indirect utility is

$$W^{O_1}(\tau_2, \kappa^F) = (1 - \tau_2)w + \kappa^F \tau_2 w \quad (2.15)$$

where $\kappa^F = 2\sigma'(2 + \sigma')^{-1}$.

When deciding whether or not to trigger a civil war, O_1 compares its expected (indirect) utility in each case. Crucially, O_1 takes into account that if he chooses war, H will be weaker in case of an interstate conflict with F , which, as previously mentioned, implies a higher probability of having F as incumbent in $s = 2$.

Let's compute O_1 's expected utility. Combining (2.13), (2.14) and (2.15), recalling that α is the probability of interstate conflict, we have that O_1 's expected utility (in period 2) in case of civil war is

$$\begin{aligned} & \alpha \left[\phi_O^{aw} W^{O_1}(\tau_2, \kappa^I) + \phi_I^{aw} W^{O_1}(\tau_2, \kappa^O) + \phi_F^{aw} W^{O_1}(\tau_2, \kappa^F) \right] \\ & + (1 - \alpha) \left[\phi_O^{pw} W^{O_1}(\tau_2, \kappa^I) + \phi_I^{pw} W^{O_1}(\tau_2, \kappa^O) \right] \end{aligned} \quad (2.16)$$

and in case of internal peace,

$$\begin{aligned} & \alpha \left[\phi_O^{ap} W^{O_1}(\tau_2, \kappa^I) + \phi_I^{ap} W^{O_1}(\tau_2, \kappa^O) + \phi_F^{ap} W^{O_1}(\tau_2, \kappa^F) \right] \\ & + (1 - \alpha) \left[\phi_O^{pp} W^{O_1}(\tau_2, \kappa^I) + \phi_I^{pp} W^{O_1}(\tau_2, \kappa^O) \right] \end{aligned} \quad (2.17)$$

Note that O_1 decides whether or not to trigger a civil war by comparing (2.16) and (2.17). Replacing $\phi_I^{aw} + \phi_O^{aw} + \phi_F^{aw} = 1$, $\phi_I^{ap} + \phi_O^{ap} + \phi_F^{ap} = 1$, $\phi_I^{pw} + \phi_O^{pw} = 1$, $\phi_I^{pp} + \phi_O^{pp} = 1$, and (2.9) and (2.10) in (2.16) and (2.17), and rearranging, we have that O_1 triggers a civil war when

$$(\alpha\Delta\phi_O^a + (1-\alpha)\Delta\phi_O^p) \left[W^{O_1}(\tau_2, \kappa^I) - W^{O_1}(\tau_2, \kappa^O) \right] > \alpha\Delta\phi_F \left[W^{O_1}(\tau_2, \kappa^O) - W^{O_1}(\tau_2, \kappa^F) \right] \quad (2.18)$$

Note that the sign of the right side of (2.18) depends on the sign of $W^{O_1}(\tau_2, \kappa^O) - W^{O_1}(\tau_2, \kappa^F)$, which measures the difference in welfare that O_1 experiments in case of having I_1 or F as incumbent in period 2. Note that $W^{O_1}(\tau_2, \kappa^O) < W^{O_1}(\tau_2, \kappa^F)$ means that O_1 is better in a regime of foreign intervention than in a regime in which I_1 continues in power.¹³

Since I am interested in how the possibility of civil war affects the incentives of I_1 to invest in fiscal capacity, and given that I_1 does not observe the current value of σ' , let's find the probability of civil war. To simplify the notation, let's define the unconditional probability of the change in the chances of turnover favouring O_1 as a consequence of a civil war, as

$$E[\Delta t_O] \equiv \alpha\Delta\phi_O^a + (1-\alpha)\Delta\phi_O^p \quad (2.19)$$

Note that $E[\Delta t_O] \geq 0$ depending on whether $\Delta\phi_O^a \geq 0$ and $\Delta\phi_O^p \geq 0$.

Let's define now the probability of civil war, i.e. the probability that (2.18) is satisfied. This probability is denoted by p . Replacing (2.13), (2.14), (2.15) and (2.19) in (2.18), and rearranging, we have that

$$p = Pr \left(\sigma' > \frac{2(\alpha\sigma\Delta\phi_F - (1-\sigma)E[\Delta t_O])}{\alpha\Delta\phi_F + (1-\sigma)E[\Delta t_O]} \right) \quad (2.20)$$

13. Note also that $W^{O_1}(\tau_2, \kappa^O) < W^{O_1}(\tau_2, \kappa^F)$ implies that O_1 always decides to trigger a civil conflict.

provided that $\alpha\Delta\phi_F + (1 - \sigma)E[\Delta t_O] > 0$. When $\alpha\Delta\phi_F + (1 - \sigma)E[\Delta t_O] \leq 0$, $p = 0$.

In (2.20) note that when $\sigma = 0$, $p = 1$. Thus, internal peace is only possible for $\sigma > 0$. Note also that when $\sigma = 1$, $p = 0$, so when institutions are perfectly cohesive, we should never expect civil war. Since these cases are no realistic, we focus on $\sigma \in (0, 1)$.¹⁴

As previously noted, I assume that σ' , as seen by I_1 , is uniformly distributed with support in the interval $[0, \frac{1}{\psi}]$, with $\psi > 1$ and $E[\sigma'] = \bar{\sigma} = \frac{1}{2\psi}$.

Adding the necessary conditions guaranteeing that p is well defined,¹⁵ we have that (2.20) is equivalent to

$$p = 1 - \frac{1}{\bar{\sigma}} \left[\frac{\alpha\sigma\Delta\phi_F - (1 - \sigma)E[\Delta t_O]}{\alpha\Delta\phi_F + (1 - \sigma)E[\Delta t_O]} \right] \quad (2.21)$$

Unconditional probability of turnover

In this subsection I study how turnover depends on the risk of an external intervention. Let's define by $\phi \equiv \phi(\alpha, p, \phi_O, \phi_F)$ the unconditional probability of turnover, i.e. $I_2 \neq I_1$, where $\phi_O \equiv \{\phi_O^{aw}, \phi_O^{pw}, \phi_O^{ap}, \phi_O^{pp}\}$ and $\phi_F \equiv \{\phi_F^w, \phi_F^p\}$. Note that $I_2 \neq I_1$ if (i) O_1 wins the internal conflict (in case of having triggered a civil war), (ii) O_1 wins the democratic elections (in case having

14. For this case note in (2.20) that a civil war is more likely for low values of σ . The intuition for this relation is straightforward : more checks and balances reduce the incentives of O_1 to trigger an internal conflict because this conflict is costly and the gains will be distributed more equally in case any domestic group wins. In support of this relation, note that countries with high checks and balances tend to be less prone to civil war (Reynal-Querol, 2002, 2005).

15. For $p \in (0, 1)$ we need

$$\alpha\sigma\Delta\phi_F > (1 - \sigma)E[\Delta t_O] > \left(\frac{\sigma - \bar{\sigma}}{1 + \bar{\sigma}}\right)\Delta\phi_F$$

Otherwise, we just have that $p = 0$ or $p = 1$. Clearly, we are interested in the case $p \in (0, 1)$. Note that it is always the case that $\sigma > \frac{\sigma - \bar{\sigma}}{1 + \bar{\sigma}}$, thus there is always a p such that $p \in (0, 1)$.

chose to act democratically), or (iii) F establishes a foreign administration.

Computing the probability of turnover in each case, we have that

$$\phi = \alpha[p(\phi_O^{aw} + \phi_F^{aw}) + (1-p)(\phi_O^{ap} + \phi_F^{ap})] + (1-\alpha)[p\phi_O^{pw} + (1-p)\phi_O^{pp}] \quad (2.22)$$

where the term $\alpha p(\phi_O^{aw} + \phi_F^{aw})$ represents the probability of turnover in case of internal an external conflict, $\alpha(1-p)(\phi_O^{ap} + \phi_F^{ap})$ the probability of turnover in case of internal peace and interstate conflict, and $(1-\alpha)[p\phi_O^{pw} + (1-p)\phi_O^{pp}]$ is the probably of turnover in the absence of interstate conflict. Since my interest is in how the probability of turnover depends on the risk of an external intervention, I focus on how $\phi(\alpha, p, \phi_O, \phi_F)$ responds to a change in α .

Let's define the unconditional probability that turnover (t) is favourable to F , as

$$E[t_F] \equiv p\phi_F^{aw} + (1-p)\phi_F^{ap} \quad (2.23)$$

Differentiating (2.22) with respect to α , and rearranging, we have that

$$\frac{\partial \phi}{\partial \alpha} = p(\phi_O^{aw} - \phi_O^{pw}) + (1-p)(\phi_O^{ap} - \phi_O^{pp}) + E[t_F] + (\alpha \Delta \phi_F + E[\Delta t_O]) \frac{\partial p}{\partial \alpha} \quad (2.24)$$

Differentiating (3.6) with respect to α , replacing this expression, (3.6) and (2.23) in (2.24), and rearranging (see proof of Proposition 1 in annexe B), we get that for $p \in (0, 1)$,

$$\frac{\partial \phi}{\partial \alpha} \geq 0 \iff \bar{\sigma} \geq \sigma \beta \kappa - \gamma \quad (2.25)$$

where $\beta = \beta(\phi_F, \phi_O)$ is

$$\beta(\phi_F, \phi_O) \equiv \frac{\Delta \phi_F}{\phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw}} \quad (2.26)$$

and $\kappa = \kappa(\sigma, \alpha, \phi_F, \phi_O)$ given by

$$\kappa(\sigma, \alpha, \phi_F, \phi_O) \equiv 1 + \frac{\alpha^2(1 + \sigma)(\Delta\phi_O^a - \Delta\phi_O^p)\Delta\phi_F + (1 - \sigma^2)(E[\Delta t_O])^2}{(\alpha\Delta\phi_F + (1 - \sigma)E[\Delta t_O])^2} \quad (2.27)$$

and $\gamma = \gamma(\phi_F, \phi_O)$ by

$$\gamma(\phi_F, \phi_O) \equiv \frac{(\Delta\phi_O^a - \Delta\phi_O^p)}{(\phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw})} \quad (2.28)$$

The functions β , κ and γ are defined in order to facilitate the comparison among the results. Note that under assumptions (2.6), (2.7) and (2.8), $\beta \geq 0$, $\gamma \geq 0$ and $\kappa \geq 1$.

Now we can formulate a first main result. It basically establishes the conditions under which an increase in the risk of an external intervention increases or decreases political stability, as defined by the probability of turnover ϕ . It states that there is a unique threshold value of $\bar{\sigma}$, denoted by $\Sigma^0(\sigma, \alpha, \beta, \kappa)$ and given by

$$\Sigma^0(\alpha, \sigma, \phi_F, \phi_O) \equiv \sigma\beta(\phi_F, \phi_O)\kappa(\sigma, \alpha, \phi_F, \phi_O) - \gamma(\phi_F, \phi_O) \quad (2.29)$$

below which the effect of an external intervention increases political stability, and above which stability decreases.

PROPOSITION 1. *For the the case $p \in (0, 1)$, there is a unique threshold value of $\bar{\sigma}$ given by (2.29) such that*

- (1.A) *if $\bar{\sigma} < \Sigma^0(\alpha, \sigma, \phi_F, \phi_O)$, an increase in the risk of an external intervention increases political stability.*
- (1.B) *if $\bar{\sigma} > \Sigma^0(\alpha, \sigma, \phi_F, \phi_O)$, an increase in the risk of an external intervention decreases political stability.*

For the case $p = 1$, an increase in the risk of an external intervention always

decreases political stability, and for $p = 0$, stability increases if and only if $\phi_F^{ap} < \phi_O^{pp} - \phi_O^{ap}$.

Démonstration. See Annexe B. □

The intuition for (1.A) is that, from the point of view of I_1 , if the share of transfers he expects the domestic opposition to receive from the foreign country is sufficient small (i.e., if the domestic opposition and the foreign government are not sufficient close), interstate warfare increases the political life of the incumbent. The intuition for (1.B) is that if this share is instead sufficient large (i.e., if the domestic opposition and the foreign government are very close), then interstate warfare leads to less political stability.

Policymaking in period 1 and investment (stage 2)

Finally I study optimal policy chosen by the incumbent in period 1, as well as his decision to invest in fiscal capacity.

Policymaking in period 1 Relative to the optimal policy, the results are very similar to those in subsection 2.2.1. The only difference is that the budget constraint includes now the costs associated with investment. In this case we have that I_1 chooses $\{t_1, \mathbf{r}_1 = \{r_1^A, r_1^B, r_1^F\}\}$ to maximize (2.1) subject to (2.3), (2.4) and $t_1 \leq \tau_1$. It is easy to see that here we have a corner solution, with $t_1 = \tau_1$, $r_1^F = 0$, $r_1^{O1} = \sigma r_1^{I1}$ and

$$r_1^{I1} = 2(1 + \sigma)^{-1}[\tau_1 w - C(\tau_2 - \tau_1)] \quad (2.30)$$

Investment in fiscal capacity Now I study the decision to invest in fiscal capacity. First let's compute I_1 's first and second period indirect utilities :

□ I_1 's period-2 utility in case I_1 is also the incumbent in period 2 (i.e. $I_2 = I_1$) is

$$W^{I_1}(\tau_2, \kappa^I) = (1 - \tau_2)w + \kappa^I \tau_2 w \quad (2.31)$$

where $\kappa^I = 2(1 + \sigma)^{-1}$.

□ I_1 's period-2 utility in case O_1 is the incumbent in period 2 (i.e. $I_2 = O_1$) is

$$W^{I_1}(\tau_2, \kappa^O) = (1 - \tau_2)w + \kappa^O \tau_2 w \quad (2.32)$$

where $\kappa^O = 2\sigma(1 + \sigma)^{-1}$.

□ I_1 's period-2 indirect utility in case F is the incumbent in period 2 (i.e. $I_2 = F$) is

$$W^{I_1}(\tau_2) = (1 - \tau_2)w \quad (2.33)$$

Relative to I_1 's first period indirect utility, replacing (2.30) in (2.1), we get

$$W^{I_1}(\tau_1, C(\tau_2 - \tau_1), \kappa^I) = (1 - \tau_1)w + 2(1 + \sigma)^{-1}[\tau_1 w - C(\tau_2 - \tau_1)] \quad (2.34)$$

Now let's calculate I_1 's expected utility. Combining (2.31), (2.32), (2.33) and (2.34), we have that I_1 's expected utility when there is no civil war is

$$\begin{aligned} W^{I_1}(\tau_1, C(\tau_2 - \tau_1), \kappa^I) + \alpha \left[\phi_I^{ap} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{ap} W^{I_1}(\tau_2, \kappa^O) + \phi_F^{ap} W^{I_1}(\tau_2) \right] \\ + (1 - \alpha) \left[\phi_I^{pp} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{pp} W^{I_1}(\tau_2, \kappa^O) \right] \end{aligned} \quad (2.35)$$

and in case of civil war is

$$\begin{aligned} W^{I_1}(\tau_1, C(\tau_2 - \tau_1), \kappa^I) + \alpha \left[\phi_I^{aw} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{aw} W^{I_1}(\tau_2, \kappa^O) + \phi_F^{aw} W^{I_1}(\tau_2) \right] \\ + (1 - \alpha) \left[\phi_I^{pw} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{pw} W^{I_1}(\tau_2, \kappa^O) \right] \end{aligned} \quad (2.36)$$

Combining the two last expressions, and recalling that p is the probability of civil war, we have that I_1 's expected utility as seen from period 1 is

$$\begin{aligned}
W^{I_1}(\tau_1, C(\tau_2 - \tau_1), \kappa^I) + p \left[\alpha \left(\phi_I^{aw} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{aw} W^{I_1}(\tau_2, \kappa^O) + \phi_F^{aw} W^{I_1}(\tau_2) \right) \right. \\
\left. + (1 - \alpha) \left(\phi_I^{pw} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{pw} W^{I_1}(\tau_2, \kappa^O) \right) \right] \\
+ (1 - p) \left[\alpha \left(\phi_I^{ap} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{ap} W^{I_1}(\tau_2, \kappa^O) + \phi_F^{ap} W^{I_1}(\tau_2) \right) \right. \\
\left. + (1 - \alpha) \left(\phi_I^{pp} W^{I_1}(\tau_2, \kappa^I) + \phi_O^{pp} W^{I_1}(\tau_2, \kappa^O) \right) \right]
\end{aligned} \tag{2.37}$$

At the beginning of period 1, I_1 chooses τ_2 by maximizing (2.37). Differentiating (2.37) with respect to τ_2 , and equalizing to zero, the first order condition is

$$\begin{aligned}
-W_C^{I_1}(\tau_1, C(\tau_2^* - \tau_1), \kappa^I) C_\tau(\tau_2^* - \tau_1) \geq p \left[\alpha \left(\phi_I^{aw} W_\tau^{I_1}(\tau_2^*, \kappa^I) + \phi_O^{aw} W_\tau^{I_1}(\tau_2^*, \kappa^O) + \phi_F^{aw} W_\tau^{I_1}(\tau_2^*) \right) \right. \\
\left. + (1 - \alpha) \left(\phi_I^{pw} W_\tau^{I_1}(\tau_2^*, \kappa^I) + \phi_O^{pw} W_\tau^{I_1}(\tau_2^*, \kappa^O) \right) \right] \\
+ (1 - p) \left[\alpha \left(\phi_I^{ap} W_\tau^{I_1}(\tau_2^*, \kappa^I) + \phi_O^{ap} W_\tau^{I_1}(\tau_2^*, \kappa^O) + \phi_F^{ap} W_\tau^{I_1}(\tau_2^*) \right) \right. \\
\left. + (1 - \alpha) \left(\phi_I^{pp} W_\tau^{I_1}(\tau_2^*, \kappa^I) + \phi_O^{pp} W_\tau^{I_1}(\tau_2^*, \kappa^O) \right) \right]
\end{aligned} \tag{2.38}$$

subject to $\tau_2 - \tau_1 \geq 0$.

In order to simplify the notation and analysis, let's define the unconditional probability of turnover favouring O_1 as

$$E[t_O] \equiv \alpha(p\phi_O^{aw} + (1 - p)\phi_O^{ap}) + (1 - \alpha)(p\phi_O^{pw} + (1 - p)\phi_O^{pp}) \tag{2.39}$$

Let's also define the following expression :

$$E[\lambda] \equiv 2(1 + \sigma)^{-1} [1 - \phi + \sigma E[t_O]] \tag{2.40}$$

Where $\phi = \phi(\alpha, p, \phi_O, \phi_F)$ is given by (2.22) and $E[t_O]$ by (2.39). $E[\lambda]$ is the expected value of transfer spending viewed from the perspective of a period-1 incumbent who does not know whether her group will be in office in period 2. The expression for $E[\lambda]$ in (2.39) has two parts. The first one, $2(1 + \sigma)^{-1}(1 - \phi)$, is the expected utility of the incumbent in case he is still in power in period 2.¹⁶ The second part, $2\sigma(1 + \sigma)^{-1}E[t_O]$, corresponds to the expected transfers to I_1 from O_1 in case O_1 is in power in period 2.

Now we can have a tractable expression for (2.38). As shown in the annexe B (see proof of Proposition 2), if we differentiate (2.31), (2.32), (2.33) and (2.34), and replace these expression, as well as (2.40), in (2.38), and rearrange, we have that (2.38) is equivalent to

$$2(1 + \sigma)^{-1}C_\tau(\tau_2 - \tau_1) \geq w(E[\lambda] - 1) \quad (2.41)$$

subject to $\tau_2 - \tau_1 \geq 0$. The interpretation of (2.41) is straightforward. The left-hand side is the marginal cost weighted by $2(1 + \sigma)^{-1}$ representing the marginal value of forgone period-1 tax revenue. The right-and side is the marginal benefit of fiscal capacity, which has two parts : $-w$, the loss of private earnings because taxation has increased, and $wE[\lambda]$, the future value of public revenue due to increased fiscal capacity.

Note that (2.41) can be written as

$$\tau_2 = C_\tau^{-1} \left(w \left[-\phi + \sigma E[t_O] + \frac{(1 - \sigma)}{2} \right] \right) + \tau_1 \quad (2.42)$$

¹⁶. Note that $(1 - \phi)$ is the probability that the period-1 incumbent is in power in period 2.

Thus it is easy to find an explicit form for $\frac{\partial \tau_2}{\partial \alpha}$. Differentiating (2.42) and rearranging, we have that the sign of $\frac{\partial \tau_2}{\partial \alpha}$ depends on the sign of the expression

$$-\frac{\partial \phi}{\partial \alpha} + \sigma \frac{\partial E[t_O]}{\partial \alpha} \quad (2.43)$$

Combining (2.22) and (2.39), we have that

$$E[t_O] = \phi - \alpha E[t_F] \quad (2.44)$$

where $E[t_F]$ is given by (2.23). Replacing (2.44) in (2.43), we have that (2.43) is equivalent to

$$-(1-\sigma) \frac{\partial \phi}{\partial \alpha} - \sigma E[t_F] - \sigma \alpha \Delta \phi_F \frac{\partial p}{\partial \alpha} \quad (2.45)$$

Replacing (2.24) in (2.45) and rearranging, we have that (2.43) is equivalent to

$$-(1-\sigma)[p(\phi_O^{aw} - \phi_O^{pw}) + (1-p)(\phi_O^{ap} - \phi_O^{pp})] - E[t_F] - \left[\alpha \Delta \phi_F + (1-\sigma)E[\Delta t_O] \right] \frac{\partial p}{\partial \alpha} \quad (2.46)$$

As shown in the annexe B (see proof of Proposition 2), differentiating (3.6) with respect to α , replacing this expression in (2.46), as well as (3.6) and (2.24), and rearranging, we have, for $p \in (0, 1)$, that (2.46) is

$$\frac{-\bar{\sigma}((1-\sigma)(\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw}) + \sigma \Delta \phi_F - (1-\sigma)(\Delta \phi_O^a - \Delta \phi_O^p)}{\bar{\sigma}} \quad (2.47)$$

Thus we can conclude that $\frac{\partial \tau_2}{\partial \alpha} \geq 0$ if and only if the expression in (2.47) is ≥ 0 , or, equivalently

$$\frac{\partial \tau_2}{\partial \alpha} \geq 0 \iff \bar{\sigma} \leq \sigma \beta^\sigma - \gamma^1 \quad (2.48)$$

where $\beta^\sigma = \beta^\sigma(\sigma, \phi_F, \phi_O)$ is given by

$$\beta^\sigma(\sigma, \phi_F, \phi_O) \equiv \frac{\Delta\phi_F}{(1-\sigma)(\phi_O^{\alpha w} - \phi_O^{pw}) + \phi_F^{aw}} \quad (2.49)$$

and $\gamma^\sigma = \gamma^\sigma(\sigma, \phi_F, \phi_O)$ by

$$\gamma^\sigma(\sigma, \phi_F, \phi_O) \equiv \frac{(1-\sigma)(\Delta\phi_O^a - \Delta\phi_O^p)}{(1-\sigma)(\phi_O^{\alpha w} - \phi_O^{pw}) + \phi_F^{aw}} \quad (2.50)$$

Note that under assumptions (2.6), (2.7) and (2.8), $\beta^\sigma \geq 0$ and $\gamma^\sigma \geq 1$.

This allows us to formulate a second result. It establishes the conditions under which an increase in the risk of an external intervention increases or decreases investment in fiscal capacity. It states that there is a unique threshold value of $\bar{\sigma}$, denoted by $\Sigma^0(\sigma, \alpha, \beta, \kappa)$ and given by

$$\Sigma^1(\alpha, \sigma, \phi_F, \phi_O) \equiv \sigma\beta^\sigma(\sigma, \phi_F, \phi_O) - \gamma^\sigma(\sigma, \phi_F, \phi_O) \quad (2.51)$$

below which the effect of an external intervention increases political stability, and above which stability decreases.

PROPOSITION 2. *For the the case $p \in (0, 1)$, there is a unique threshold value of $\bar{\sigma}$ given by (2.51) such that*

(2.A) *if $\bar{\sigma} < \Sigma^1(\alpha, \sigma, \phi_F, \phi_O)$, an increase in the risk of an external intervention increases investment in fiscal capacity*

(2.B) *if $\bar{\sigma} > \Sigma^1(\alpha, \sigma, \phi_F, \phi_O)$, an increase in the risk of an external intervention decreases investment in fiscal capacity*

For the case $p = 1$, an increase in the risk of an external intervention always decreases investment in fiscal capacity, and for $p = 0$, fiscal capacity increases if and only if $\phi_F^{\alpha p} < (1-\sigma)(\phi_O^{pp} - \phi_O^{\alpha p})$.

Démonstration. See Annexe B. □

This proposition basically states that, from the point of view of I_1 , if the expected share of transfers the domestic opposition would receive from the foreign country is sufficient small, interstate warfare increases investment in fiscal capacity. Importantly, assumptions (2.6), (2.7) and (2.8) imply that¹⁷

$$\frac{\partial \Sigma^1}{\partial \sigma} \geq 0 \quad (2.53)$$

Note that (2.53) implies that when institutions are very cohesive, it is less likely that a foreign administration gives to the opposition more than what they expect to receive in case the current state quo persists. In this situation we should expect that an increase in the external threat is state building. In addition, (2.53) implies that when institutions are not cohesive, it is more likely that the members of the domestic opposition expect to receive not less from the foreign administration than what they expect to receive if the current state quo persists. In this case we should expect that an external threat is not state building.

2.2.2 Political stability and investment in fiscal capacity

A particularly interesting question is whether an increase in political stability caused by a more likely external threat implies an increase in investment in fiscal capacity, and if a decrease in political stability results in a decrease in investment. In this subsection

Propositions 1 and 2 established the existence of two thresholds for $\bar{\sigma}$,

17. Just note that

$$\frac{\partial \Sigma^1}{\partial \sigma} = \frac{\Delta \phi_F (\phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw}) + (\Delta \phi_O^a - \Delta \phi_O^p) \phi_F^{aw}}{[(1 - \sigma)(\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw}]^2} \quad (2.52)$$

which is positive since $\Delta \phi_F \geq 0$ and $\phi_O^{aw} - \phi_O^{pw} \geq 0$, as assumed in (2.6) and (2.7), and $\Delta \phi_O^a - \Delta \phi_O^p > 0$, implied by assumptions (2.7) and (2.8)

denoted by Σ^0 (in Prop. 1) and Σ^1 (in Prop. 2), below which the effect of an increase in the risk of an external intervention increases political stability (Prop. 1) and encourages in fiscal capacity (Prop. 2), and above which stability and fiscal capacity should decrease. However, the thresholds are not identical. This shows that although political stability plays a crucial role in explaining the impact of external threats on fiscal capacity, it is not the only factor. In particular, it implies that more political stability does not always translate in more investment in fiscal capacity.

In the next Proposition I establish some conditions under which $\Sigma^0 \geq \Sigma^1$, i.e., that a change in political stability caused by an external threat implies a decrease or increase in fiscal capacity.

PROPOSITION 3. *For the case $p \in [0, 1)$, there is a $\sigma^* \in [0, 1)$ such that for all $\sigma \geq \sigma^*$, if an increase in the risk of an foreign intervention implies*

(3.A) a decrease in political stability, then it also implies a decrease in investment in fiscal capacity.

(3.B) an increase in political stability, then it does not necessarily imply an increase in investment in fiscal capacity.

For the case $p = 1$, an increase in the risk of an external intervention always implies a decrease in political stability and in investment in fiscal capacity.

Démonstration. See Annexe B. □

The result in (3.A) states that if as a consequence of an increase in the risk of an external intervention, the chances that the first-period incumbent continues in power in period 2 fall, then this group has less incentives to increase the capacity of the state for the next period. The intuition is straightforward : more fiscal capacity implies that the group in power in period 2 will be able to capture more rents, which now come in greater proportion from the first-period incumbent (as he will more likely be in opposition).

A more interesting and less intuitive result is established in (3.B). It states that if as a result of an increase in the risk of an external intervention, the chances that the incumbent stays in power increase, it is not always the case that he decides to invest in more state capacity. The intuition behind this new result crucially depends on the condition that σ is sufficiently high. The argument is as follows. First, note that the immediate effect of an external threat is to increase the probability that a foreigner is in power, but that this does not mean that the probability that the incumbent continues in power (i.e. the overall political stability) decreases. This probability can in fact increase, if, as a consequence of this threat, the incumbent receives the support of the domestic opposition : if this support is big enough, the decrease in the probability that the domestic opposition is in power can compensate the higher risk of a foreign administration, making the overall probability of turnover smaller.

However, note that the probability that the foreign country is in power can still be very big, and could have been increased with the higher risk of an external intervention. Thus, although the overall probability of turnover is smaller, the worst scenario for the incumbent (a foreign administration) can still be more likely, and can make him less willing to invest in fiscal capacity. How bad a foreign administration is depends on σ , and if sufficiently bad, it will explain why more political stability could translate into less investment.

To see this note that a big σ means that the domestic opposition will share a very large portion of his rents with the incumbent in case of being in power in period 2. Since in the same situation the foreign power will set this portion to zero, relative to a government led by the domestic opposition, a foreign administration will be a very bad scenario for the first-period incumbent. In addition, note that a big σ implies that the support that the domestic opposition gives to the incumbent, key for political stability, could not be very

valuable to the incumbent (insofar as being in the opposition is not very bad if institutions are very cohesive), and could not compensate the expected loss that the incumbent will suffer in case of a foreign administration. Thus, if σ is sufficient big, the expected loss associated to a more likely foreign administration might not being compensating with the expected gains associated to a higher stability, and when this happens, the first-period incumbent has no incentives to increase the second-period fiscal capacity.

To shed more light about this result, it is useful to consider the case $p = 0$ (i.e. the probability of civil war is zero), for which an stronger result can be established. For this case we found in propositions 1 and 2 that an increase in the risk of an external intervention increases stability if and only if $\phi_F^{ap} < \phi_O^{pp} - \phi_O^{ap}$ (Prop. 1), and increases fiscal capacity when $\phi_F^{ap} < (1 - \sigma)(\phi_O^{pp} - \phi_O^{ap})$ (Prop. 2). Note that stability and investment increases when $\phi_O^{pp} - \phi_O^{ap}$ is big enough, i.e. when the chances that the opposition gets power (democratically) decrease enough in case of an external threat (for instance when the existence of an external threat provides leaders more instruments to deal with the opposition). In addition, note that¹⁸

$$(\phi_O^{pp} - \phi_O^{ap}) > (1 - \sigma)(\phi_O^{pp} - \phi_O^{ap}) \quad (2.54)$$

Inspection of (2.54) allows us to say that

- (i) If an increase in the risk of an external intervention decreases political stability (i.e. $\phi_F^{ap} > \phi_O^{pp} - \phi_O^{ap}$) then it also decreases investment in fiscal capacity (i.e. $\phi_F^{ap} > (1 - \sigma)(\phi_O^{pp} - \phi_O^{ap})$). As previously mentioned, the intuition behind this result is straightforward.
- (ii) If an increase in the risk of an external intervention increases political stability (i.e. $\phi_F^{ap} < \phi_O^{pp} - \phi_O^{ap}$), then how fiscal capacity is affected (i.e.

18. Recall that by (2.8), $\phi_O^{pp} - \phi_O^{ap} \geq 0$.

$\phi_F^{ap} \geq (1 - \sigma)(\phi_O^{pp} - \phi_O^{ap})$ depends on σ . Let's define σ^* such that $\phi_F^{ap} = (1 - \sigma^*)(\phi_O^{pp} - \phi_O^{ap})$, or, equivalently,

$$\sigma^* = 1 - \frac{\phi_F^{ap}}{\phi_O^{pp} - \phi_O^{ap}} \quad (2.55)$$

Thus, for all $\sigma \geq \sigma^*$, we have that $\phi_F^p > (1 - \sigma)(\phi_O^{pp} - \phi_O^{ap})$, which implies a decrease in fiscal capacity. In addition, we have that for all $\sigma < \sigma^*$, $\phi_F^p < (1 - \sigma)(\phi_O^{pp} - \phi_O^{ap})$, which means an increase in fiscal capacity.¹⁹ In (2.55), note that σ^* is negatively related to ϕ_F^{ap} , the probability that the foreign country is in power in case there is no civil war. Note that the bigger this probability, the more likely the possibility that more stability translates into less investment. The intuition behind this result is based on the idea that in order to have investment, incumbent's expected gain from the domestic opposition's support (that makes a civil war very unlikely and increases political stability) must be big enough to compensate the loss associated to a foreign administration. The higher the probability of a foreign administration, the bigger this gain must be, and this gain is bigger when institutions are not cohesive (because in that case political stability matters more).

Proposition 3 can be related with the literature studying the relation between political stability and better public policies, and, in particular, with an interesting recent result by Acemoglu, Golosov, and Tsyvinski (2011) : that greater persistence might harm the party in power because when power finally deviates away from current incumbent, the new incumbent is more likely to remain in power, getting a bigger transfer and leaving less to the former incumbent after he has left power. Part (3.B) contributes to this idea by providing a novel mechanism through which more persistence in the

19. This last result is true only for the case $p = 0$.

identity of the party in power might be associated with worse outcomes : the greater persistence, being the result of an increase in the risk of a foreign administration, opens the door to a situation for the incumbent when he leaves power that, if institution are sufficiently cohesive, is significantly worse than that with more power switches but with less risk of a foreign mandate.

2.3 Some Empirical Evidence

As previously noted, the key prediction of the model is that national fiscal systems are affected differently by the threats countries face from foreign enemies. Specifically, the model predicts that the impact of external threats on fiscal capacity depends on the proximity between the foreign enemy and the domestic opposition. In this section, I empirically examine some measures of tax structure, exploring some conditional correlations between these outcome variables and the determinants suggested by the theory. The intuition behind these correlations was already presented in Figures 2.3 and 2.4, described in the introduction. This section complements this analysis conditioning the effect of external threats on fiscal capacity on more covariates and in a more precise way. The data and proxies used are also described in more detail. This section can be seen as a complement and extension of the empirical findings that *B&P* present in support of their theoretical framework. As them, I do not intent to make any claims of capturing causal relations, but rather to assess whether the basic correlations in the data are consistent with the theory.

2.3.1 Data and Parameters

To measure fiscal capacity (the variable τ in the model) I use data on fiscal revenues per capita from the International Monetary Fund (IMF).²⁰ This data is available for more than 163 countries from 1975 onwards.²¹ Absent direct data on past investments in fiscal capacity (before 1975), I focus on the historical incidence of some determinants suggested by the model on today's fiscal capacity.²² I take the ratio of total tax revenue to GDP. Since the model is about building the capacity to charge an income tax, I also use the share of income tax revenue on GDP. This data is expressed as an average from 2000 onward. As *B&P* argue, might be highly correlated with fiscal capacity.

Following the previous literature on interstate conflicts (see Martin, Mayer, and Thoenig, 2008, 2012; Baliga, Lucca, and Sjöström, 2011; Conconi, Sahuguet, and Zanardi, 2014) I use the (annual) Correlates of War (COW) data to measure the historical incidence of external threats.²³ I look at whether a given country is engaged in a militarized interstate dispute (MID) of high intensity in a given year.²⁴ I create a measure of how large a share of the

20. See Baunsgaard and Keen (2005, 2010) for a description of the data.

21. For some countries the data is available from 2000 onwards.

22. The fact of looking at the incidence of past determinants on today's fiscal capacity (as external threats, inclusiveness of political institutions and civil wars) helps to partially solve the problem of endogeneity of these determinants.

23. <http://www.correlatesofwar.org/>

24. I use the dyadic form of the data from Maoz (2005), <http://vanity.dss.ucdavis.edu/maoz/dyadmid.html>. This dataset lists all bilateral interstate conflicts from 1816 to 2001, and quantifies their intensity on a 1 to 5. Each MID is coded with a hostility level ranging from 1 to 5, where 1 = No militarized action, 2 = Threat to use force, 3 = of force, 4 = Use of force, and 5 = War, defined as a conflict with at least 1,000 deaths of military personnel. I follow the practice common in the empirical literature of interstate conflicts (e.g. Maoz and Russett (1993); Martin, Mayer, and Thoenig (2008, 2012); Baliga, Lucca, and Sjöström (2011), Conconi, Sahuguet, and Zanardi (2014)) using a broad definition of conflicts which includes display of force, use of force, and war itself. These are all government-approved and non-accidental decisions.

years between 1946,²⁵ or the year of independence (if later), and 2000 that a country was involved in a MID. I hypothesize that the historical incidence of this kind of disputes serves as a proxy for the past exposure to external threats.

The model has the nontrivial implication that the historical incidence of violent conflict should be correlated with fiscal capacity today, but that this correlation should depend on the proximity between the foreign enemy and the domestic opposition (the variable $\bar{\sigma}$ in the model). I hypothesize that the geographical distance among the countries in conflict, and, in particular, whether the main enemy of a country in a year is contiguous, serves as proxy for this proximity. As previously mentioned, we can think for instance of an opposition that shares the same ethnicity of the foreign country because the opposition members mostly live in a region at the border. If the data support the theory, I should find that external threats from contiguous countries (i.e. big $\bar{\sigma}$) are systematically associated with lower fiscal capacity, and threats from non-contiguous countries (i.e. small $\bar{\sigma}$) are associated with higher fiscal capacity. To measure contiguity, I use annual data from the COW project. This database identifies all direct contiguity relationships between states in the international system from 1816 through 2006. I combine this dataset with the information on MIDs.²⁶

25. This year corresponds to the first year there is data on civil wars. The results are however robust to the inclusion of information for the period 1816-1945.

26. The classification system consists of five categories, one for land contiguity and four for water contiguity. The four water contiguity categories are : i) contiguous for up to 12 miles of water; ii) contiguous for 13-24 miles of water; iii) contiguous for 25-150 miles of water; iv) contiguous for 151-400 miles of water. As in Baliga, Lucca, and Sjöström (2011), I say that two countries are contiguous they are land or water contiguous. Since these conflicts were for the different countries in some years against contiguous enemies, and in other years against non contiguous, I constructed two different measures of past exposure to conflicts according to the contiguity with the different enemies. I say that a country was in conflict with a (non)contiguous enemy during a year if during that year the country experimented at least one dispute of high intensity (display of force) with at least one (non)contiguous country. As a percentage of the total number of

As other common determinants of the fiscal capacity outcomes, I include several sets of independent variables. First I include a measure of political institutions. The theory predicts that the inclusiveness of political institutions (the parameter σ in the model) is one of the key factors shaping investments in fiscal capacity. As a proxy for σ I compute for each country the average value of from 1946 (or independence) to 2000 for its constraints on the executive, as coded in the Polity IV dataset.²⁷ Second, I include data on civil wars. The possibility of a civil conflict is crucial in the theory, having a negative impact on fiscal capacity through its effect on political stability. Although it is endogenously determined by the external threats, I only test its historical incidence on fiscal capacity. I use data from the UCDP-PRIO,²⁸ looking at whether a given country is engaged in a civil war in a given year and computing the average value of from 1946 (or independence) to 2000. Third, I include a measure of ethnic heterogeneity, from Fearon (2003),²⁹ as a proxy for internal fragmentation. As previously suggested, heterogeneity within a country, if correlated with heterogeneity among countries, might alter the mechanism through which external threats affect incumbent's decisions.³⁰ Fourth, in order to control for the possibility that my proxy for the historical incidence of external threats is mainly capturing colonial power, I include a measure of relative military capacity based on the Composite Index of National Capability (CINC) from the COW project. This index reflects the extent and depth of the resources that a nation could bring to bear in instances

disputes experienced by all countries in the period 1946-2000, in 59% of cases a country experienced a conflict against contiguous countries only, in the 22% of cases the conflict were against non-contiguous countries only, and in 19% of cases against both kinds of enemies.

27. <http://www.systemicpeace.org/polity/polity4.htm>

28. <http://www.pcr.uu.se/research/ucdp/datasets/>

29. <http://www.stanford.edu/group/ethnic/publicdata/publicdata.html>

30. According to (Alesina and La Ferrara, 2000), it might also hinder state building directly.

of militarized disputes.³¹ First I compute for each year, the average of the CINC for those countries classified as major powers by the COW that year. Then I compute, for each country-year, the ratio between their CINC and this average. Finally, I compute for each country the average of this measure from 1946 (or independence) to 2000. Fifth, for income (the parameter w in the model), I use the logarithm of GDP per capita measured in the year 2000 according to the Penn World Tables (Variable "Real GDP par capita in constant 2005 international prices", in version 6.3). Finally, I include a set of indicators for legal origins, as in many recent studies of institutions following La Porta et al. (1998); La Porta, Lopez-de Silanes, and Shleifer (2008).

2.3.2 Cross-Sectional Correlations

Table 2.1 presents the basic correlations. In columns (1)-(4) the dependent variable is the tax revenue share in GDP, and in columns (5)-(8) the income tax revenue share in GDP. Each column corresponds to different specifications, with different set of controls. Columns (1)-(3) and (4)-(7) show that, as expected from the theory, the proxies for external threats are significantly correlated with both measures of fiscal capacity. Crucially, as predicted by the theory, the correlation is positive only when the disputes are between non-contiguous countries. For disputes between contiguous countries, the correlation is negative.³² This result is robust to the inclusion of controls for

31. Specifically, the CINC measures a nation's material capabilities and combines values for total population, urban population, iron and steel production, energy consumption, military personnel, and military expenditure.

32. The sizes of the coefficients can be interpreted as follows. In columns (1)-(3), the estimated coefficient for the prevalence of conflicts with contiguous countries fluctuates around -1 . This means that a country that entails 50% rather than 0% of the last 50 years (or the time since independence) spent in wartime is associated with lower fiscal capacity in the present by about half a standard deviations in the sample. By a similar calculation, the estimated coefficient for the prevalence of conflicts with non-contiguous countries fluctuates around 1.5, which means that a country with a 50% of the last 50

political institutions, ethnic heterogeneity and historical incidence of civil war. When controls for national capacity and income are added, the coefficients are barely statistical significant (at least at 10%).³³

As an additional argument in support of the relevance of the division between contiguous and non contiguous interstate conflicts, in Table 2.2 I examine whether fiscal capacity and external threats are correlated when I do not separate between these two kind of disputes. As expected, the proxy for the historical incidence of (all kind of) external threats is statistically insignificant. This provides more evidence that the geographical proximity between the countries in conflict is key.

An important prediction of the theory is that the differentiated effect of external threats on fiscal capacity depends on how cohesive are institutions (σ in the model), and the probability of civil war (p in the model). The model predicts that external threats from contiguous and non contiguous countries affect differently fiscal capacity only if there is uncertainty about the onset of a civil conflict (i.e. $p \in (0, 1)$). Additionally, the theory predicts that the effect depends on σ . The results in Table 2.1 in some way supports this prediction : when, in columns (2),(3),(6) and (7), proxies for cohesive institutions and risk of civil war are included, the effect of external threats (both from contiguous and non contiguous enemies) is smaller and less statistically significant.

A more direct way to examine this hypothesis is to look at those countries with high (or low) risk of civil war and very cohesive (or non cohesive) institutions. Thus, I construct two new variables. First, a dummy variable equal to one for low risk of civil war (less than the average) ; I call it no civil war. Second, for cohesive institutions, another dummy equal to one for high

years pent in wartime is associated with a higher present fiscal capacity of about one and a half standard deviation in the sample.

33. As shown below, the results will be robust to the inclusion of these covariates for countries with non cohesive institutions and high incidence of civil war.

TABLE 2.1: Fiscal capacity and external threats from contiguous and non-contiguous enemies

	Tax revenue share in GDP (average 2000-2010)				Income tax revenue share in GDP (average 2000-2010)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ext.threats (contiguous) 1946-2000	-1.263*** (0.309)	-1.069*** (0.299)	-0.656* (0.355)	-0.672* (0.361)	-0.007*** (0.002)	-0.005*** (0.002)	-0.004 (0.003)	-0.003 (0.002)
Ext.threats (non-contig.) 1946-2000	1.897*** (0.472)	1.380** (0.568)	1.392** (0.667)	1.575* (0.804)	0.016*** (0.005)	0.013** (0.006)	0.013** (0.006)	0.016** (0.008)
Exec. constraints 1946-2000		0.895*** (0.254)	1.234*** (0.282)	0.878** (0.403)	0.006*** (0.002)	0.009*** (0.002)	0.009*** (0.002)	0.005*** (0.002)
Ethnic fractionalization			-0.385 (0.318)	-0.123 (0.397)			-0.000 (0.002)	0.001 (0.002)
Civil War 1946-2000			-0.437 (0.577)	-0.107 (0.549)			0.002 (0.005)	0.004 (0.005)
Relatv. Nal. Cap. (CINC) 1946-2000				-0.205 (0.569)				-0.004 (0.003)
Log(GDP percapita) in 2000				0.087 (0.122)				0.001* (0.000)
R-squared	0.139	0.215	0.314	0.373	0.162	0.247	0.339	0.457
Observations	160	160	137	136	155	155	135	134
Dummies for legal origin	N	N	N	Y	N	N	N	Y

Notes : The dependent variable in columns (1) to (4) is the tax revenue share in GDP, and in columns (5)-(8) the share of income tax revenue on GDP, in both cases expressed as an average from 2000 onward; this data is taken from the IMF. Dependent variables are standardized. All columns report OLS estimates. *Ext.threats (contiguous) 1946-2000* and *Ext.threats (non-contig.) 1946-2000* correspond to the share of the years that a country was involved in a militarized interstate dispute of high intensity with a contiguous and a non-contiguous enemy; the data on MID is from Maoz (2005) and on contiguity from COW. *Exec. constraints 1946-2000* is the average value of each country's constraints on the executive, as defined by Polity IV, *Civil War 1946-2000* is the proportion of years with civil war over the years without civil war, using data from UCDDP-PRIO, and *Relatv. Nal. Cap. (CINC) 1946-2000* is the average value of the ratio between each country's Composite Index of National Capability (CINC) and that of the major powers, using data from COW. All these averages are calculated from the same period, 1946-2000. *Ethnic fractionalization* is the ethnic fractionalization index from Fearon (2003), and *Log(GDP percapita) in 2000* is the logarithm of GDP per capita measured in the year 2000 from the Penn World Tables. Robust standard errors are in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

TABLE 2.2: Fiscal capacity and external threats from all types of enemies

	Tax revenue share in GDP (average 2000-2010)			Income tax revenue share in GDP (average 2000-2010)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ext.threats (all enemies) 1946-2000	-0.220 (0.330)	-0.352 (0.321)	0.067 (0.317)	-0.059 (0.348)	0.002 (0.002)	0.001 (0.002)	0.002 (0.002)	0.002 (0.002)
Exec.constraints 1946-2000		1.159*** (0.233)	1.480*** (0.262)	1.083** (0.416)		0.008*** (0.002)	0.011*** (0.002)	0.007*** (0.002)
Ethnic fractionalization			-0.405 (0.324)	-0.102 (0.417)			-0.001 (0.002)	0.001 (0.002)
Civil War 1946-2000			-0.453 (0.649)	-0.018 (0.689)			0.002 (0.006)	0.004 (0.006)
Relatv. Nat. Cap. (CINC) 1946-2000				0.197 (0.456)				-0.000 (0.002)
Log(GDP percapita) in 2000				0.152 (0.127)				0.001** (0.001)
R-squared	0.003	0.143	0.263	0.323	0.003	0.157	0.263	0.379
Observations	160	160	137	136	155	155	135	134
Dummies for legal origin	N	N	N	Y	N	N	N	Y

Notes : The dependent variable in columns (1) to (4) is the tax revenue share in GDP, and in columns (5)-(8) the share of income tax revenue on GDP, in both cases expressed as an average from 2000 onward; this data is taken from the IMF. Dependent variables are standardized. All columns report OLS estimates. *Ext.threats (all enemies) 1946-2000* corresponds to the share of the years that a country was involved in a militarized interstate dispute of high intensity; the data on MID is from Maoz (2005). *Exec. constraints 1946-2000* is the average value of each country's constraints on the executive, as defined by Polity IV, *Civil War 1946-2000* is the proportion of years with civil war over the years without civil war, using data from UCDDP-PRIO, and *Relatv. Nat. Cap. (CINC) 1946-2000* is the average value of the ratio between each country's Composite Index of National Capability (CINC) and that of the major powers, using data from COW. All these averages are calculated from the same period, 1946-2000. *Ethnic fractionalization* is the ethnic fractionalization index from Fearon (2003), and Log(GDP percapita) in 2000 is the logarithm of GDP per capita measured in the year 2000 from the Penn World Tables. Robust standard errors are in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

TABLE 2.3: Fiscal capacity and external threats from contiguous and non-contiguous enemies : interaction with executive constraints and civil war

	Tax revenue share in GDP (average 2000-2010)			Income tax revenue share in GDP (average 2000-2010)		
	(1)	(2)	(3)	(4)	(5)	(6)
Ext.threats (cont) 1946-2000	-3.061** (1.427)	-3.380** (1.518)	-3.226** (1.531)	-0.027** (0.011)	-0.025** (0.012)	-0.023** (0.012)
Ext.threats (non-cont) 1946-2000	4.947*** (1.858)	5.082*** (1.873)	4.730** (1.951)	0.046*** (0.016)	0.045*** (0.017)	0.046*** (0.017)
High exec. constraints	-0.598 (0.673)	-1.016 (0.719)	-1.169* (0.701)	-0.007 (0.005)	-0.010* (0.005)	-0.010* (0.005)
Ext.threats (cont) × exec.constr	2.853* (1.580)	3.013* (1.670)	2.980* (1.666)	0.023* (0.012)	0.021 (0.013)	0.022* (0.013)
Ext.threats (non-cont) × exec.constr	-3.073 (2.233)	-2.885 (2.326)	-2.468 (2.333)	-0.029 (0.019)	-0.026 (0.020)	-0.027 (0.020)
No civil war	-1.030 (0.699)	-1.251 (0.758)	-1.178 (0.791)	-0.006 (0.005)	-0.006 (0.005)	-0.006 (0.005)
Av.ext.threats(contiguous) × no.civwar	2.283 (1.508)	2.937* (1.586)	2.804* (1.606)	0.023** (0.011)	0.024* (0.012)	0.023* (0.012)
Ext.threats (non-contig.) × no.civwar	-3.002 (2.132)	-4.126* (2.097)	-3.799* (2.071)	-0.035** (0.017)	-0.038** (0.017)	-0.038** (0.016)
No.civwar × exec.constr	1.194* (0.711)	1.219 (0.750)	1.290* (0.736)	0.011** (0.005)	0.011* (0.006)	0.010* (0.006)
Ext.threats(cont) × no.civwar × exc.costr	-2.611 (1.747)	-2.996 (1.841)	-2.884 (1.834)	-0.020 (0.013)	-0.021 (0.013)	-0.021 (0.013)
Ext.threats(non-cont) × no.civwar × exc.costr	1.914 (2.499)	2.831 (2.531)	2.461 (2.504)	0.024 (0.020)	0.026 (0.021)	0.028 (0.021)
Exec. constraints 1946-2000	0.460 (0.528)	0.941 (0.573)	0.890 (0.666)	0.004 (0.004)	0.007*** (0.003)	0.007** (0.003)
Civil War 1946-2000	-1.609** (0.692)	-1.499* (0.760)	-1.136 (0.832)	-0.001 (0.005)	-0.000 (0.006)	0.000 (0.006)
Ext.threats (cont) if exc.costr&civwar	-0.208 (0.662)	-0.368 (0.683)	-0.246 (0.672)	-0.004 (0.005)	-0.004 (0.005)	-0.002 (0.005)
Ext.threats (non-cont) if exc.costr&civwar	1.875 (1.318)	2.197 (1.390)	2.262* (1.267)	0.017 (0.012)	0.019 (0.012)	0.018 (0.011)
Ext.threats (cont) if exc.costr&no.civwar	-0.536 (0.518)	-0.426 (0.551)	-0.326 (0.526)	-0.001 (0.003)	-0.001 (0.002)	0.001 (0.002)
Ext.threats (non-cont) if exc.costr&no.civwar	0.787* (0.450)	0.902* (0.509)	0.923* (0.520)	0.006** (0.003)	0.007** (0.003)	0.009** (0.004)
Ext.threats (cont) if no.exc.costr&no.civwar	-0.778 (0.496)	-0.443 (0.454)	-0.422 (0.489)	-0.004 (0.003)	-0.001 (0.003)	-0.001 (0.003)
Ext.threats (non-cont) if no.exc.costr&no.civwar	1.945* (1.047)	0.956 (0.892)	0.931 (1.007)	0.011* (0.006)	0.007 (0.005)	0.008 (0.005)
R-squared	0.322	0.444	0.440	0.378	0.576	0.589
Observations	150	137	136	145	135	134
Ethnic fractionalization	N	Y	Y	N	Y	Y
Dummies for legal origin	N	Y	Y	N	Y	Y
Relatv. Nal. Cap. (CINC) 1946-2000	N	N	Y	N	N	Y
Log(GDP percapita) in 2000	N	N	Y	N	N	Y

Notes : The dependent variable in columns (1) to (3) is the tax revenue share in GDP, and in columns (4)-(6) the share of income tax revenue on GDP, in both cases expressed as an average from 2000 onward. Dependent variables are standardized. All columns report OLS estimates. *Ext.threats (cont) 1946-2000* and *Ext.threats (non-cont) 1946-2000* correspond to the share of the years that a country was involved in a militarized interstate dispute of high intensity with a contiguous and a non-contiguous enemy. *High exec. constraints* is a dummy equal to one if the average value of each country's constraints on the executive is above the average (used as a proxy for high executive constraint), and *No civil war* is a dummy equal to one if the proportion of years with civil war over the years without civil war is below the average (used as a proxy for low risk of civil war). *exc.costr* and *no.exc.costr* mean high and low executive constraints respectively, and *civwar* and *no.civwar* mean high and low risk of civil war, respectively. For the other controls, and sources see Table 2.1. Robust standard errors are in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%.

executive constraints (higher than the average). I interact these dummies with my proxies for the historical incidence of external threats. The results are shown in Table 2.3. In the first two lines, the coefficients for external threats from contiguous and non contiguous enemies represent the effect in the case the risk of civil war is above the average, and institutions are not cohesive (low σ). As expected, for the case of contiguous threats (high $\bar{\sigma}$) the effect is negative, and for non-contiguous threats (high $\bar{\sigma}$), the effect is positive. Interestingly, this result is now robust to all specifications. At the bottom of the table, I present the effect of both kind of external threats for the other possible combinations. Also as predicted by the theory, for the case of cohesive institutions (high σ), the only effect that exists is positive (for no civil wars), confirming the hypothesis that when institutions are cohesive, an external threat contributes to state-building because it is more more difficult that the domestic opposition prefers as incumbent the foreign power.

Of course, as previously stated, these cross-sectional correlations are not reliable enough for any meaningful test of the theory. However, it is encouraging that the basic correlations in the data are consistent with the theory. One of the main drawbacks of this analysis is that countries experimenting conflicts with contiguous and non contiguous enemies differ in many institutional, policy, historical and cultural aspects. In particular, past fiscal capacity, for which I do not have data, may be highly correlated with present fiscal capacity, and may have been an important driver of a country's decision to engage in interstate conflicts. Thus cross-country regressions are unlikely to reveal the causal effect of external threats on fiscal capacity. More convincing test for the theory should exploit time-series variation.

2.4 Conclusion

In most of the recent literature on state capacity the significance of interstate wars in state-building relies on the assumption that threats from external enemies generate common interests among groups in society, leading to larger investments in state capacity. In addition, external and internal disputes are conceived in this literature as two distinct and independent types of conflicts. However, a large number of cases and some cross-country correlations suggest that this might not be the case for last century's conflicts, most of them occurring in developing countries. This chapter contributes to these literature by developing an alternative explanation based on the possibility of a close relation between interstate conflicts and civil wars, and in which interstate warfare is not a common-interest public good.

In the theoretical analysis a government must face two kind of threats, one from a foreign country, and other from an internal opposition. Crucially, the model admits a possible link between the internal opposition and the foreign country. A first main result establishes that in equilibrium, investment in fiscal capacity depends on the strength of this link : when it is strong, the opposition and foreign country's actions are strategic complements and reinforce each other, leading to higher probability of civil war, which raises instability and leads to smaller investment in fiscal capacity. And when the link between the opposition and the foreign country is weak, opposition and foreign country's actions are strategic substitutes, so the external threat makes the opposition less belligerent, increases the political life of the incumbent government making him more willing to invest in fiscal capacity.

The interplay between political stability and investment in fiscal capacity that supports the relation between external threat and fiscal capacity leads to an additional and important result : while less political stability trans-

lates into less fiscal capacity, more stability does not automatically imply more state building. Whether or not they are equivalent depends on how cohesive are institutions : for institutions sufficient cohesive, the gains from the higher stability might not compensate the bad outcomes from a more probable foreign administration, an then more stability translates into less state-building.

A rough inspection of the data suggests that some basic correlations are consistent with the theory. In particular, using as a proxy for the strength of the link between a country's internal oppositions its foreign enemy the fact that the countries in conflict are or not contiguous, it is found that those countries that during more years experienced external threats from contiguous countries tend to be also those countries with less fiscal capacity. The opposite occurs by looking at those threats from non contiguous countries. This pattern is coherent with the first main result if the geographical proximity between two countries is positively correlated with the strength of the links between a country's opposition and its main foreign enemy.

Chapitre 3

Conflict externalization and negotiation : theory and case evidence from Colombia

3.1 Introduction

Existing theoretical literature on civil wars often assumes that a group's decision of whether or not to fight depends exclusively on the domestic context, i.e. on other *domestic* groups' decisions.¹ However, as increasing empirical literature on conflict is demonstrating, the regional context also has an important effect on domestic conflicts.² The contemporary conscious-

1. See Blattman and Miguel (2010) and Jackson and Morelli (2011) for reviews of the literature. See Kydd (2010) (and below in this introduction) for a review of some of the few exceptions in formal models.

2. See Mason, Weingarten, and Fett (1999), Hegre and Sambanis (2006), Gleditsch (2007), Balch-Lindsay, Enterline, and Joyce (2008) and Cunningham, Skrede Gleditsch, and Salehyan (2009); Cunningham, Gleditsch, and Salehyan (2011) for evidence showing that the regional context (e.g. a conflict in a neighboring country, a highly autocratic region, trans-boundary ethnic groups, or direct intervention of external parties) matters for the onset, incidence and duration of civil war.

ness is well aware of the regional dimensions of conflicts in Burma, Nicaragua, Kosovo, Sudan, Lebanon and Iraq, for example.³ At the time of writing, military tensions in the Ukraine between pro-Russian rebels and pro-Western leaders were occurring, and an understanding of this conflict is clearly impossible without seriously considering its regional dimensions.⁴

To fill this gap, I develop a simple model of conflict externalization, and provide new case-study evidence from Colombia. The objective of the model is not merely to formalize an already existing theory, but to also propose a new mechanism through which the possibility that an external party participates in an internal conflict could significantly affect the outcome of the conflict. Besides illustrating the applicability of the model, the Colombian case provides new evidence on this topic.

In the model, a government and a group of rebels simultaneously choose whether or not to use violence against each other. Violence is costly, but can also decrease the opponent's military resources, which increases the probability of victory for the aggressor. Crucially, the use of violence might cause a third (foreign) actor to join in the conflict. When this happens, I say that the domestic conflict "externalizes."

This externalization changes the power dynamic between the two domestic actors. I assume that only the government's use of violence can trigger such externalization. For example, consider a group of rebels strategically located along a porous border, where the neighboring country shares the same ideology or ethnicity as the rebels. Given the porosity of the border, an attack on the rebels by the domestic government might imply a violation

3. See South (2008) for the conflict in Burma, Gleditsch and Beardsley (2004) for the Nicaragua-Contras conflict, Crawford (2001); Kuperman (2008) for Kosovo, Ali, Elbadawi, and El-Batahani (2005) for Sudan, Bouckaert and Houry (2007) for Lebanon, and Gunter (2008) and Morelli and Pischedda (2013) for the Iraqi-Kurdish conflict.

4. See The Guardian (2014b, April 13) and Gorodnichenko, Mylovanov, and Talavera (2014).

of the sovereignty of the neighboring country. Given the sympathies between the rebels and the neighboring country's government, the aggression could motivate a military response, starting a conflict spiral that might lead to an international war.⁵

In case of an external conflict, the domestic government faces an additional decrease in its military resources, which indirectly favours the rebels. I take the probability of participation by the external party as given, and focus on how the threat of an external intervention affects the likelihood of peace. The first main contribution of the chapter is to show that the risk of externalization increases the likelihood of peace, but that this only happens if the domestic government is sufficiently powerful relative to the rebels, and if the risk of externalization is sufficiently high. The intuition is as follows. When a government is very powerful, the rebels know they cannot win with a violent attack without a simultaneous attack by a foreign government. Thus, when the domestic government prefers peace, and there is no risk of externalization, the rebels' best response is also peace. From the government's point of view, the choice depends on how great the risk of externalization is. If it is low, it is optimal for them to attack when attacked; by attacking, they can guarantee a victory. In this scenario, peace is very unlikely. However, when the risk of externalization is high, the story is different : the government knows that an attack can trigger an external conflict, with which its chances of victory significantly decrease. Thus, since an attack by the rebels won't make the government lose the internal conflict, the government prefers to tolerate an attack (from the rebels). This strategy, combined with the rebels' interest in a peace settlement, makes peace very likely.

5. As I will argue later, this situation perfectly matches the recent dynamic of the Colombian internal conflict, but it is not exclusive to this case. Burma-Thailand border clashes prompted by Burma's pursuit of Karen National Liberation Army rebels across the border into Thailand is another example. See South (2008, 2012).

The second main contribution of the chapter is to provide new case-study evidence from Colombia. Colombia has suffered the longest-running internal conflict in the world. Although many armed groups have participated in the conflict, the left-wing Revolutionary Armed Forces of Colombia (FARC) has been the largest non-government actor. The conflict has been accompanied by a permanent process of government negotiations with all groups, including three failed peace talks with the FARC. In September 2012, after an all-out military campaign against the FARC during which this group suffered the worst blows in its history, the Colombian government announced the start of new peace negotiations. This announcement surprised many analysts and national leaders, who expected a few more years of war, ending with a government victory. At the time of writing, both the FARC and the Colombian government were expressing their optimism, announcing that these peace talks have gone significantly further than ever before.

Despite its relevance, to the best of my knowledge no rationalist explanation has been proposed to account for both the onset and development of Colombia's ongoing peace talks. I show that the risk of externalization of the Colombian conflict (particularly intervention by Venezuela) is at the root of the peace negotiations, creating what some literature on conflict has called a "ripe for resolution" situation.⁶

In the years preceding the peace talks, the geography of the Colombian conflict changed dramatically : the FARC lost presence in regions in the interior of the country, and strategically moved toward border areas with Venezuela and Ecuador. An ideological affinity between the FARC and these two countries' governments, as well as the porosity of the borders in these regions, was crucial to the government's decision to engage in peace talks. The movement of the FARC opened the door to an externalization of the conflict :

6. See Zartman (2000) and Pruitt (2005).

a violation of the Venezuelan territorial sovereignty by the Colombian army was very likely if the conflict continued, as well as a military response from Venezuela if this aggression were to occur. Once aware of the high risk of interstate war, the Colombian government changed its strategy : the presence in Venezuela of the FARC's top leaders would be tolerated, and peace talks would be encouraged. This decision was optimal from the government's perspective, given that a FARC defeat was impossible without risking a war with Venezuela, and that a revolution was very unlikely. Since for the FARC a peace settlement was also the best response given its limited chance of victory, the context was very favourable for a peaceful outcome.

Clearly, my proposed explanation about the recent developments of the Colombian internal conflict is not the only one, and the risk of externalization is not the only factor that could explain the onset and evolution of the ongoing peace talks. Less ideological extremism and less militarism from both parties could also have played a crucial role (see Medina, 2012). However, the risk of externalization should be taken into account in any discussion on the issue.

My model can be best described as a model of third party intervention, and it is related to the few but increasing theoretical studies on this topic (see Fearon, 1998; Carment and Rowlands, 1998; Werner, 2000; Crawford, 2003; Carment and Rowlands, 2006; Amegashie and Kutsoati, 2007; Grigoryan, 2010; Yuen, 2009; Kydd and Straus, 2013). The model is consistent with what this literature calls the "deterrence" hypothesis : the idea that an external party can play a crucial role in the outcome of an internal conflict by deterring one of the domestic parties from making a decision that harms his opponent (see Fearon, 1998; Carment and Rowlands, 1998; Werner, 2000; Crawford, 2003). In the model, peace is possible because the risk of externalization deters the government from attacking the rebels, given that it could prompt externalization that could make rebels stronger. Although the argu-

ment does not account for “moral hazard” — that an external intervention biased in favour of one party might make this party more belligerent⁷ — the model can be easily extended to include this possibility.⁸ However, in the context of the Colombian conflict, this phenomenon does not seem to play an important role, and despite its simplicity, the model is able to provide non-trivial and new and empirical predictions. In particular, as in Kydd and Straus (2013), I find that the fact that a biased external intervention makes war less likely depends on whether power is balanced, but unlike them, I find that peace is more likely when the government is stronger, even if an intervention strengthens the rebel group.

The outline of the chapter is as follows. Sections 3.2 and 3.3 present the model. Section 3.4 presents and analyzes the case study based on the model. Section 3.5 concludes.

3.2 Model

In this section, I develop a simple model that illustrates how the risk of a domestic conflict externalizing can affect the outcome of the conflict. In the model, the world is composed of two countries, H (home) and F (foreign), possibly neighbors. The population of H is divided between two groups : one in power (G , for government), the other in opposition (R , for rebels). It is assumed that F is homogeneous in its composition.

The government and rebels play a simultaneous-move game in which each

7. See (Carment and Rowlands, 2006; Amegashie and Kutsoati, 2007; Yuen, 2009; Grigoryan, 2010; Kydd and Straus, 2013).

8. As I will discuss later, it is enough to assume that the costs of using violence are different for the government and rebels. In this case, a high risk of externalization will give the rebels more incentives to attack when attacked. The inclusion of this possibility does not change the key findings.

group decides whether or not to use violence against the other. The model focuses on this interaction, taking the probability of action by F (provided that the government uses violence) as given. However, F will be crucial for the analysis : an eventual conflict between G and R might externalize, forcing F to intervene. The game has two possible outcomes : a violent conflict or peace. In both cases, the outcome depends on the relative resources or military strength of each party, which (with some abuse of notation) are initially set to G , R and F for the government, rebels and foreign country, respectively.

A violent conflict occurs if either G or R decides to attack the other party. When both parties decide not to attack, peace occurs and no party incurs a cost. The outcome of the game is determined by the *initial* strength of each party.

The use of violence implies a fixed cost $C > 0$ for both parties. In addition, if either G or R attacks, the resources of the attacked party decreases by some amount $L > 0$. L can be interpreted as the relative gain (in resources or power) for attacking.⁹

Crucially, the use of violence creates the possibility that the conflict externalizes, which means that F enters the game as an additional enemy of G . This happens with probability ϕ , and can occur only if G attacks. The consequence of F entering the game is an interstate dispute between G and F . An interstate conflict favours R by decreasing G 's resources or power by (with some abuse of notation) F . Consider, for example, an internal conflict where some members of the opposition are located close to a border that H shares with F (see Figure 3.1). Then, given the proximity of R to F , and the

9. The assumption that C and L are the same for both the government and the rebels seem restrictive. However, when properly constrained, the results are robust to a possible difference. This assumption simplifies the analysis, and allows one to focus on more interesting results.

mobility of R between the two countries because of either porous borders or sympathy from F , an offensive action by G in R 's controlled territory might harm the citizens of F or be interpreted by F as a violation of its sovereignty.

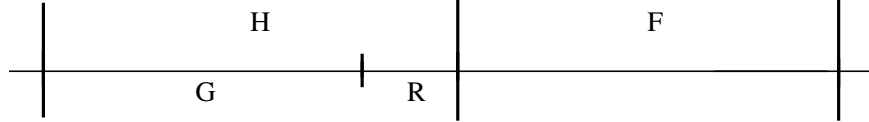


FIGURE 3.1: Possible scenario of civil war externalization

I assume that all players know G , F and L , but have imperfect information about R . In particular, I make the following assumption about R :

ASSUMPTION 2. R is a continuous random variable with domain \mathbb{R} , cumulative distribution function Z , density z , and mean \bar{R} . In addition, $Z'' < 0$, and $Z(x) = 0$ for all $x \leq 0$.

In other words, the resources or power of the opposition are unknown to both the opposition and the government.¹⁰ It intends to capture the idea that the opposition is somewhat informal, in the sense that its resources (in terms of arms or troops) are less known than those of the government. This is particularly true when borders are porous, and if there is uncertainty about how effectively F surveils its border, as the level of arms or troops flowing in from F is unknown.

Finally, I assume the most simple and natural technology of conflict, that the domestic group with the most power wins the game. This means that if the resources of the government and rebels are A and B , respectively, the government's probability of victory is $Pr[A > B]$.¹¹

10. Note that I assume that *all* R is unknown. This is without a loss of generality; the results do not change if I instead assume that a part of these resources is random.

11. Note that although this assumption could make the war technology very sensitive

Timing

The timing of the game is as follows :

1. G and R decide simultaneously whether to attack each other ; if either decides to attack, a conflict occurs.
2. If neither party attacks, peace occurs ; in this case, a party wins with a probability that depends on its relative initial resources.
3. If there is a violent conflict, there are some exogenous costs $C > 0$ for both parties. In addition, the resources of a party decrease in L if it is attacked by its domestic opponent.
4. If G decides to attack R , the conflict externalizes with a probability ϕ . If this occurs, an interstate conflict between G and F begins ; if that happens, the resources of G reduce by F .
5. The conflict ends. Each group gets its payoff according to the outcome.

Payoffs

As previously noted, the outcome of the game (and payoffs) when either peace or conflict occurs depends on the relative resources or power of each party. These resources determine the probability of victory in either case. Once the conflict is resolved, the winner gets V and the loser gets W , where $V > W$. Thus, if both G and R decide to attack, G expects to get

$$\begin{aligned}
 & V \left[\phi Pr[G - L - F > R - L] + (1 - \phi) Pr[G - L > R - L] \right] \\
 & + W \left[\phi Pr[G - L - F < R - L] + (1 - \phi) Pr[G - L < R - L] \right] - C
 \end{aligned} \tag{3.1}$$

to the resources of the parties, it seems a reasonable modelling given that the resources of only one of the parties has a stochastic component. For a discussion on the theoretical foundations of conflict technologies and, in particular, their stochastic derivations, see Jia (2008) and Jia and Skaperdas (2012). As Jia (2008) shows, if I instead assume that the resources of both parties have an stochastic component, a more natural choice would be a proportional form (i.e. $\frac{f(A)}{f(A)+f(B)}$).

The first line in (3.1) represents G 's payoff in the event of victory, with $\phi Pr[G - L - F > R - L]$ representing its probability of victory in the event that the conflict externalizes, and $(1 - \phi)Pr[G - L < R - L]$ representing the probability of victory in the event that the conflict does not externalize. In the second line of (3.1), $\phi Pr[G - L - F < R - L]$ is the probability that R wins if F intervenes, and $(1 - \phi)Pr[G - L < R - L]$ is the probability that there is no such intervention. In order to simplify the notation, and without a loss of generality, I assume that $V = 1$ and $W = 0$. Note that by Assumption 2, $Pr[X < R] = Z(X)$. Thus, by replacing these expressions in (3.1) and rearranging, it is easy to see that (3.1) is equivalent to

$$\phi Z(G - F) + (1 - \phi)Z(G) - C \quad (3.2)$$

Let us use a to denote a decision to use violence (i.e. attack), and let p represent a decision not to use violence (i.e. peace). Then, let us use g , r and f to denote the actions taken by G , R and F respectively, where $g, r, f \in \{a, p\}$.

The payoffs for all the cases, after having rearranged and omitting some constants, are given in Table 3.1.

	$r = a$	$r = p$
$g = a$	$G : \phi Z(G - F) + (1 - \phi)Z(G) - C$ $R : -[\phi Z(G - F) + (1 - \phi)Z(G)] - C$	$G : \phi Z(G + L - F) + (1 - \phi)Z(G + L) - C$ $R : -[\phi Z(G + L - F) + (1 - \phi)Z(G + L)] - C$
$g = p$	$G : Z(G - L) - C$ $R : -Z(G - L) - C$	$G : Z(G)$ $R : -Z(G)$

TABLE 3.1: Payoff matrix : general case

3.3 Equilibrium

I now solve the model, focussing on pure strategy Nash equilibria (NE). I start with a few remarks about the best-response functions. Then I consider a baseline case with no externalization, and study the general case.

3.3.1 Best Responses

Let us use $g(y)$ to denote the best response of G given that R plays $r = y$, and $r(x)$ to denote the best response of R given that G plays $g = x$. Note that for $x, y \in \{a, p\}$, (x, y) is a NE if and only if $g(y) = x$ and $r(x) = y$.

Note first that it is always the case that

$$r(a) = a \tag{3.3}$$

This follows directly from Table 3.1, observing that given $g = a$, R always prefers to play $r = a$ under the assumption that $L > 0$ and $Z' > 0$. The intuition is that once $g = a$, an attack by R is costless (since $g = a$ implies that $C > 0$ for both parties), and by playing $r = a$, R can increase its probability of victory. Note that (3.3) implies that (a, p) cannot be an equilibrium.

Now I introduce an assumption that rules out the possibility that violence is a strictly dominant strategy for both parties.

ASSUMPTION 3. *(i) $G > L$ and (ii) $Pr[R > L] \geq (1 - C)$.*

Assumption 3 states that the harm that R and G can cause by using violence is limited by their own resources. Part *(i)* says that the harm that G can cause cannot exceed its own resources. The intuition behind this assumption is that governments experience important constraints in the proportion of their resources they can spend on warfare. Part *(ii)* captures the idea that

rebels are informal armies and therefore have fewer constraints about the methods they can employ, but they also have some resource limitations. Specifically, part (ii) states that although the probability that R is greater than L is not 1 (which would be the case if they operated like the government), this probability is lower bounded. This bound decreases with C , which means that when R has more to lose (greater C), R 's constraints are more severe. This threshold also guarantees that C is not too small to make a violent conflict unavoidable.

Crucially, Assumption 3 implies that $r(p) = p$.¹² That $r(p) = p$ is always true could make Assumption 3 to look too strong, since in reality there may be circumstances in which rebels attack even if they are not attacked. However, this assumption is not essential for the main result, and helps us to eliminate some uninteresting cases. For instance, without Assumption 3, C can be large enough to make $r = a$ a strictly dominant strategy for the rebels (i.e. that $r(x) = a$ for $x \in \{a, p\}$). Under these circumstances, peace is not possible. It is easy to see that $r = a$ occurs for a sufficiently small G (but $G > L$), which is also true in my main result. Thus, instead of saying that peace is impossible for a sufficiently small G , I say that where G is small, peace is very unlikely.¹³

Summarizing, Assumptions 2 and 3 result in $r(a) = a$ and $r(p) = p$. In next two subsections I will identify $g(a)$ and $g(p)$.

12. See "Proof of Proposition 1" in the Annex. C

13. The fact that $r(a) = a$ and $r(p) = p$ for all ϕ implies that R 's actions are insensitive to the likelihood of an external intervention. This rules out the possibility of "moral hazard," i.e., that an external intervention biased in favour of the rebels motivates them to be more belligerent. This result depends on the assumption that the costs of violence are the same for the government and rebels. This allows us to focus on more interesting results.

3.3.2 No Externalization

In this subsection I examine the case where $\phi = 0$, which serves as a baseline model for the study of the impact of the risk of externalization on the outcome of conflict. Table 3.2 shows the payoff matrix for this case, which results from replacing $\phi = 0$ in Table 3.1.

	$r = a$	$r = p$
$g = a$	$G : Z(G) - C$ $R : -Z(G) - C$	$G : Z(G + L) - C$ $R : -Z(G + L) - C$
$g = p$	$G : Z(G - L) - C$ $R : -Z(G - L) - C$	$G : Z(G)$ $R : -Z(G)$

TABLE 3.2: Payoff matrix : case of no externalization

I examine $g(a)$ and $g(p)$ (from last subsection, we have that $r(a) = a$ and $r(p) = p$). First, note from Table 3.2 that it is always true that $g(a) = a$. This follows directly from Assumption 2, Assumption 3.(i) and the fact that $L > 0$.¹⁴ Since by (3.3) we also have that $r(a) = a$, this implies that (a, a) is always a NE. The intuition behind this result is that if there is no risk of externalization, G always prefers to attack when attacked; by attacking, G increases its probability of victory without increasing the costs of violence, given that these costs are already present because of R 's action.

Second, it is also possible to show from Table 3.2 that $g(p) = p$. This new finding, combined with $r(p) = p$, implies that (p, p) is also an equilibrium.

These results are summarized in the following proposition :

PROPOSITION 1. *If Assumptions 2 and 3 hold, for the case $\phi = 0$, both peace and war are potential outcomes of the game.*

14. By Assumption 2 and the fact that $L > 0$, $Z(G) \geq Z(G - L)$, and by Assumption 3.(ii), $G > L > 0$, so $Z(G) > Z(G - L)$.

Démonstration. See Annex C. □

This proposition essentially says that if $\phi = 0$, we have a stag-hunt game with two strict equilibria, (a, a) and (p, p) . Note that Assumption 3 is crucial for the existence of two equilibria. If we instead assume that C can be very small and L very large, the only equilibrium is (a, a) and we have a prisoner's dilemma. As mentioned previously, the assumption that C is not too small to make a violent conflict unavoidable allows us to focus on more interesting cases.

3.3.3 General Case

I now study the case where $1 \geq \phi \geq 0$. For this situation to occur, a potential externalization and corresponding attack by F must be able to effectively harm G . However, the harm doesn't have to be catastrophic; it is enough that an attack by F causes more harm to G than that caused by R . More formally, we need :

ASSUMPTION 4. $F > L$

The intuition for this condition and its relevance is the following. If $F \leq L$, the payoff that G gets when attacking and when externalization occurs is greater than the payoff it gets when G does not attack, but is attacked by the rebels. In other words, when $F \leq L$, attacking is a strictly dominant strategy for G , because the harm it suffers from F in the worst-case scenario (where it is attacked by F) is smaller than the harm he can suffer from R in the worst-case scenario (where R attacks). Thus, when $F \leq L$, the outcome of the game is the same regardless of the risk of externalization, so ϕ can only have an impact when $F > L$.

I can now establish a first simple result, which only requires Assumptions 2, 3 and 4 :

PROPOSITION 2. *As $\phi \rightarrow 1$, there is always peace.*

Démonstration. See Annex C. □

I now explore what happens when $\phi < 1$. I introduce the following assumption about F ; although it is not required for the main result, it simplifies the proof, and does not alter the main argument.

ASSUMPTION 5. $F \geq G$

This assumption states that the foreign country is at least as powerful as the domestic government.

I can now establish the main result. It includes the following threshold :

$$\bar{\phi} = 1 - \frac{Z(F - L)}{Z(F)} \quad (3.4)$$

PROPOSITION 3. *If Assumptions 2 to 5 hold, we have that :*

(1) *If $\phi > \bar{\phi}$, there exists a unique threshold $\bar{G}(\phi, L, F)$ defined by*

$$\phi Z(\bar{G} - F) + (1 - \phi)Z(\bar{G}) - Z(\bar{G} - L) = 0 \quad (3.5)$$

such that

(1.1) *Peace is the only outcome of the game if $G > \bar{G}(\phi, L, F)$*

(1.2) *Both peace and war are potential outcomes of the game if $G \leq \bar{G}(\phi, L, F)$*

(2) *If $\phi \leq \bar{\phi}$, both peace and war are outcomes of the game regardless of G .*

Démonstration. See Annex C. □

The intuition of Proposition 3 is as follows. The risk of externalization increases the tolerance of the government to an attack from rebels : when this

tolerance is sufficiently large, such that the costs of a violent response are too high, peace is chosen. This is coherent with the “deterrence” hypothesis referred to in the introduction.

What is interesting about this simple mechanism is that the risk of externalization affects the level of tolerance only when the government is sufficiently powerful. A weak government, when attacked by the rebels, can be seriously harmed, so it prefers to attack too, even if the risk of externalization is very high. In this case, peace is unlikely and the risk of intervention is irrelevant. Conversely, a strong government will not lose a lot when attacked only by the rebels, so it prefers to tolerate this violence rather than risk serious harm in the event of externalization.

To the best of my knowledge, this result is new in the literature. In Section 4, I show that it is crucial to understanding recent, intriguing peace talks between the Colombian government and the FARC. First, however, I expand on the implications of Proposition 3, and establish some additional consequences from comparative statics.

How powerful must the government be to ensure peace ?

In Proposition 3, we have that peace is the only outcome if the government is sufficiently powerful relative to a threshold, denoted by \bar{G} and implicitly defined in (3.5). However, it is not clear what this threshold means and, in particular, how is it related to the strength of the government’s main enemy. In the following proposition, I compare \bar{G} with the expected power of the rebels, that in Assumption 2 was denoted by \bar{R} . Crucially, the result depends on whether $L \geq \bar{R}$.

PROPOSITION 4. *For $L \geq \bar{R}$, it is always the case that $\bar{G} > \bar{R}$. For $L \leq \bar{R}$, there exists a $\phi' \geq \bar{\phi} > 0$ such that $\bar{G} < \bar{R}$ for all $\phi > \phi'$ and $\bar{G} \geq \bar{R}$ for all $\phi \leq \phi'$.*

Démonstration. See Annex C. □

Proposition 4 states that whether or not the government must be significantly more powerful than the rebels in order to ensure peace depends on the relation between L and \bar{R} . On the one hand, when $L > \bar{R}$, the government must be significantly more powerful than the rebels (such that $G > \bar{G} > \bar{R}$). On the other hand, when $L \leq \bar{R}$, provided that the risk of externalization is large enough, the government does not need to be more powerful (i.e. $G \sim \bar{R} > \bar{G}$), and could even be slightly weaker (such that $\bar{R} > G > \bar{G}$).

3.3.4 Comparative statics

In this subsection I characterize $\bar{\phi}$ and \bar{G} as defined in (3.4) and (3.5), and establish some comparative statics. First, by implicitly differentiating (3.5), we have the following important consequence :

COROLLARY 1. $\frac{\partial \bar{G}}{\partial \phi} < 0$

Démonstration. See Annex C. □

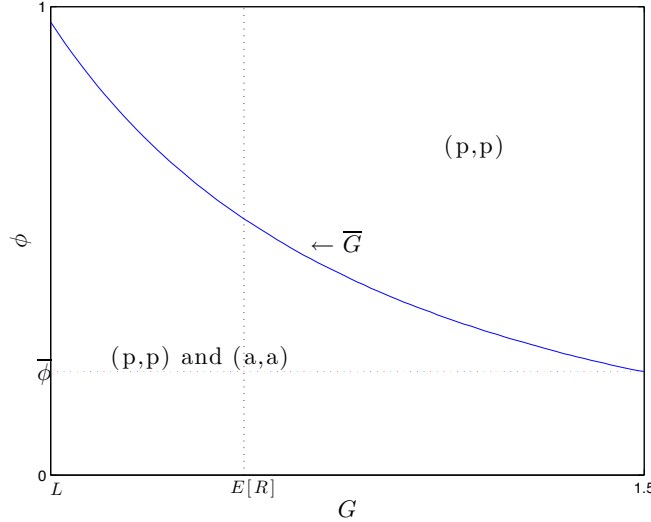
Corollary 1, together with Proposition 1, allows us to characterize the different equilibria as a function of G and ϕ . This is shown in Figure 3.2. Peace is the only outcome of the game when both ϕ and G are large enough. Otherwise, as in the case of no externalization, peace and war are both possible. With a sufficiently small G , an increase in the risk of externalization does not affect the probability of peace.

The following corollary establishes the dependence of \bar{G} and $\bar{\phi}$ on F and L .

COROLLARY 2. (i) $\frac{\partial \bar{\phi}}{\partial F} < 0$; (ii) $\frac{\partial \bar{G}}{\partial L} > 0$; (iii) $\frac{\partial \bar{\phi}}{\partial L} > 0$

Démonstration. See Annex C. □

FIGURE 3.2: Comparative statics : government strength versus probability of externalization



Strenght of Government (G) versus risk of externalization (ϕ). The graph is a numerical simulation corresponding to $R \sim \exp(\lambda)$, $Z(x) = 1 - \exp(-\lambda x)$, $E[R] = \bar{R} = \lambda^{-1} = 0.9$, $L = 0.6$, $F = 1.5$, $C = 0.8$ and $M = 1$

Part (i) of Corollary 2 says that an increase in the resources of the foreign country makes peace more likely by decreasing the risk of externalization necessary to ensure peace. Parts (ii) and (iii) state that an increase in the efficiency of attacks makes peace less likely by increasing both the risk of externalization and the strength of government necessary to ensure peace.

3.4 Case study evidence from Colombia

In this section, I provide case-study evidence from Colombia, a country recently exemplifying the dynamics of my model.¹⁵ I use information from

¹⁵. Reports from Colombia's Historical Memory Group provide useful background. For a general overview, refer to Grupo de Memoria Hist3rica (2013b), and for information on

the main actors in the Colombian conflict, as well as from the secondary academic literature. The evidence suggests that in the ongoing peace negotiations between Colombia and the FARC, the risk of an interstate conflict with Venezuela and Ecuador, caused by an strategic retreat of the FARC to Colombia's border regions, played a crucial role. In this section, I argue that the mechanism through which the risk of such interstate conflicts affects decisions is that proposed in my model.

3.4.1 Background

The current Colombian conflict dates back to the late 1950s. Its origins have been associated with the founding of the FARC, which is currently Colombia's largest and best-equipped rebel group.¹⁶ The FARC was not affiliated with either of Colombia's two main political parties (Liberal or Conservative), but was ideologically aligned with the Communist Party.¹⁷ Other smaller rebel groups, also independent of the party system, have participated in Colombia's conflict since then. These include other left-wing insurgents, and right-wing paramilitaries.¹⁸ Between 1958 and 2012, the conflict claimed at least 220,000 lives,¹⁹ and its roots have been associated with struggles for land, labor conditions and tributary extraction.²⁰

Since the 1980s, the Colombian conflict has been accompanied by a permanent process of negotiation with all groups, including three failed peace

the FARC, see Grupo de Memoria Histórica (2013a). For a good analysis of the Colombian conflict in recent years, see Medina (2010)

16. See Grupo de Memoria Histórica (2013b, Cap. 2).

17. See Palacios and Safford (2002, p. 355) and Grupo de Memoria Histórica (2013a, p. 62).

18. The most important left-wing insurgent other than the FARC is the National Liberation Army (ELN), and among the right-wing paramilitaries, the main group was the the United Self-Defense Forces of Colombia (AUC), which officially demobilized in 2006.

19. See Grupo de Memoria Histórica (2013b, p. 31).

20. See Sanchez (2001).

talks with the FARC.²¹ The most recent attempt, known as the “Caguán” peace process, took place from 1998 to 2002 between the government and the FARC. These talks resoundingly failed. A relatively strong rebel group, amateurish bargaining teams and spoilers (actors who use violence to undermine peace talks) are some of the explanations given for Caguán’s failure.²² The breakdown of the Caguán peace process led to the election of a relatively new hawkish and far-right president, Alvaro Uribe, and started a period of intense war between the government and the FARC.

Government empowerment

During the 2000s and early 2010s, Colombia’s government pursued an all-out military effort against the FARC. Due to an increase in defense spending and a significant improvement in military effectiveness, the Colombian government achieved relative success : during this period, the FARC suffered the worst blows in its history. According to the Colombian Ministry of Defense, 39856 FARC members were captured or killed from 2002 to 2011. In the same period around 17343 members demobilized. The same ministry estimates that during this period the number of FARC combatants was halved.²³ The government’s military victories also included the killing of several FARC leaders, including its top leader, in a action characterized by the Colombian president as “the most devastating blow that this group has suffered in its history.”²⁴ These actions were deeply resented by the FARC.²⁵

21. See Sanchez (2001), Chernick (2009) and Nasi (2006, 2009).

22. See Nasi (2006, 2009) and Kline (2007).

23. See Ministerio de Defensa (2009) and <https://www.youtube.com/watch?v=vnuqZ0w0B0o>. The exact number of FARC members captured, killed and deserting have been debated by analysts (Avila, 2013; Rico, 2013) and the FARC (FARC-EP, 2013b, February 12), but analysts agree with the government that the number of combatants fell by roughly a half during the 2000s.

24. Translation by the author from <https://www.youtube.com/watch?v=UI0CJzJLsxU>.

25. See <http://www.rebellion.org/noticia.php?id=138858>.

During this period, the FARC lost presence in key regions in the center of the country (i.e. in the departments of Cundinamarca, Tolima, Boyacá and Santander) and retreated to border areas with Venezuela and Ecuador (i.e. to the departments of Nariño, Cauca, Caquetá, Norte de Santander and Arauca).²⁶ FARC's decision to move to the periphery of the country was strategic, given ideological similarities between the FARC and Venezuela's and Ecuador's governments, and the porosity of the borders with these two countries. The FARC's decision, combined with a hawkish military strategy by the Colombian government, brought the three countries to the brink of war. I argue that it also raised the likelihood of a peaceful solution.

On the brink of war

In March 2008, Colombian security forces crossed the border into Ecuador to assault an outpost of the FARC. More than two dozen rebels were killed, including a high-ranking rebel leader thought by many to be FARC's second-in-command. The Colombian government also captured computers with documents indicating that Venezuela had been supporting the FARC.²⁷

The assault caused a serious diplomatic incident between Colombia and Ecuador. Ecuador immediately broke off diplomatic relations with Colombia. Venezuela, in solidarity with Ecuador, expelled Colombia's ambassador and other diplomats.²⁸ Venezuela and Ecuador also sent troops to the Colombian border, advising that any additional violations of their sovereignty would result in war.²⁹ The highest point of tension was reached in July 2010 when, some weeks before a change in Colombia's government, the Colombian press secretary provided evidence of a FARC presence in Venezuela to international

26. See IISS (2011) and, in particular, Avila (2013).

27. See IISS (2011).

28. See The New York Times (2008, March 4)

29. See <https://www.youtube.com/watch?v=Xp7Gs1-tm1w>.

authorities.³⁰

In the following days, the Colombian Ambassador to the Organization of American States (OAS) presented a series of photographs, maps, coordinates, and videos proving the presence of illegal armed groups in Venezuelan territory.³¹ Venezuela reacted by breaking off diplomatic relations with Colombia, sending more troops to the border and ordering them to be on full alert. Venezuelan President Hugo Chavez said :

To maintain our dignity, we do not have any other option but to sever diplomatic ties with Colombia ... We will be on alert — I have ordered the maximum alert along our border ... Uribe is a threat for peace. He is even able to establish a fake camp in our territory and raid it to start a war (Hugo Chávez, July 22, 2010)³²

The Colombian government was aware of the high risk of war, particularly if it violated a neighbor's sovereignty. The Colombian Minister of Defense at the time, said :

I say privately to President Uribe, “If you authorize, I bring Marquez and everyone who are there [in Venezuela], without troops, and I guarantee that these people are in Colombia [...] he did not authorize. He said it was too risky for the country and for national security ... I do believe that a war with Venezuela was very

30. According to the Colombian press secretary, “For six years the Colombian government sustained a patient dialogue with the Venezuelan government, on various occasions providing it information on the location of terrorists in that territory. All was unsuccessful with respect to terrorist leaders. We must once again consider taking the matter to international authorities.” See Presidencia de Colombia (2010, July 16).

31. See OAS (2010, July 22) and <https://www.youtube.com/watch?v=J2W0E027yEQ>.

32. Translation of the author from https://www.youtube.com/watch?v=q1_AFMvwg9U. See also https://www.youtube.com/watch?v=_pMDx1ihhQo

close” (Gabriel Silva, 2013)³³

A moment in history

In July 2010, Colombia severed diplomatic relations with Venezuela. Two weeks later, a new Colombian president, Juan Manuel Santos, took office. Elected with a mandate to continue Uribe’s hard-line policies, and closely associated with Uribe’s successful military campaigns against the FARC, Santos was known for his strategic pragmatism.³⁴

From his early days in office, Santos combined an extremely aggressive campaign against the FARC with an effort to improve diplomatic relations with Venezuela. Ten days after he was sworn in, diplomatic relations with Venezuela were restored,³⁵ and approximately one month later, Santos announced the death of the FARC’s second-in-command and leader of its strongest fighting division. One year later, the FARC’s top leader, who went by the nom de guerre of Alfonso Cano, was killed. The FARC’s choice for Cano’s replacement, whose nom de guerre was Timochenko, was also influential in the future of the conflict : Timochenko was known for operating along the border with Venezuela,³⁶ and for having lived there previously.³⁷ In addition, many people had raised concerns about the close ties between Timochenko and important figures in the Venezuelan government.³⁸

In September 2012, almost one year after Timochenko had become FARC’s leader, the Colombian president announced that his government and the

33. See Davila (2014, p. 89-91).

34. See Revista Semana (2010, June 12).

35. This decision would lead to a rupture in Santos’s relationship with Uribe (Davila, 2014, p. 90).

36. See El Tiempo (2011b, November 15).

37. See El Tiempo (2011a, November 19).

38. Timochenko has been called the FARC’s “ambassador” to Venezuela (see Caracol Noticias, 2010, March 2).

FARC had agreed to start a peace process. The announcement surprised analysts and important national leaders.³⁹ These peace talks were the first open negotiations in a decade. After one-and-a-half years of talks, both the FARC⁴⁰ and the Colombian government⁴¹ expressed their optimism, announcing that these peace talks have gone significantly further than any previous talks.

3.4.2 Analysis

Why did the FARC and the Colombian government decide to pursue peace? I suggest that the risk of externalization of the Colombian conflict to Venezuela is at the root of the peace talks, creating what some literature on conflict has called a “ripe for resolution” situation.⁴²

FARC’s motivations for the new attempt at peace are relatively clear : the significant blows suffered between 2002 and 2011 seem to be key.⁴³ FARC’s top leader has recognized to the relevance of these blows : “I can’t deny we’ve received serious blows — and extremely painful ones. The deaths of four members of the National Secretariat can’t be minimized [...] it’s obvious that conditions of today are not the same as those a decade ago.”⁴⁴ FARC’s prior losses mean that its costs to continue the conflict would be very high.

In terms of the model proposed in this chapter, FARC’s best response to peace is peace (i.e., $r(p) = p$). It is possible that this had always been FARC’s strategy.⁴⁵ In any case, the FARC are clearly aware of the costs

39. See Revista Semana (2012, September 3) for initial reactions.

40. See FARC-EP (2014, April 30).

41. See The Guardian (2014a, March 16).

42. See Zartman (2000) and Pruitt (2005).

43. See Pardo (2012), Vargas (2012) and Aljazeera (2012, August 30).

44. See Carlos Lozano’s website (2012, September 19, 2012), translation of the author.

45. According to the FARC’s leader, the FARC “negotiate because a political solution has always been our objective, and also that of the people’s movement.” (See Carlos Lozano’s

of their actions. Asked for the reasons why they decided to negotiate with Santos, the FARC's top leader, Timochenko, said :

Whatever may come, persistent conflict will entail many more deaths and great destruction, more sorrow and tears, more poverty and misery for some and greater wealth for others. Imagine the lives that could have been saved these 10 years. That's why we seek negotiations, a solution without blood, and an understanding through political routes (Timochenko, September 19, 2012) ⁴⁶

This awareness was also recognized by FARC's representative of the peace delegation, Pablo Catatumbo :

We are ready to start preparing the way that will lead us towards the expression of our regret for what has happened [...] No doubt there have also been harshness and pain caused from our side (Pablo Catatumbo, August 20, 2013) ⁴⁷

The Colombian government's motivations for negotiating with the FARC are less apparent. A first element that has been highlighted by both analysts and the Colombian government is the increase in the power of Colombian forces relative to those of the FARC. As Colombia's president Santos said, "If we can talk about peace now [...] it is because of the effectiveness of our armed forces."⁴⁸

But if the Colombian government was winning the war, why wouldn't it continue fighting the FARC for a few more years, as advocated for by former president Uribe ? ⁴⁹ War is costly and unpredictable, so rational agents should have incentives to reach peaceful settlements that all would prefer to

website (2012, September 19, 2012), translation of the author).

46. See Carlos Lozano's website (2012, September 19, 2012), translation of the author.

47. See FARC-EP (2013a).

48. See Presidencia de Colombia (2012b, October 25, 2012), translation of the author.

49. See Caracol Noticias (2012, October 28, 2012).

the war.⁵⁰ However, from the point of view of the majority of the Colombian population, media, and important leaders (mostly from the right), just before the peace talks were made public, the FARC were close to being defeated. Thus, the government's cost of war could be perceived as being very low. In fact, at the time, a peace process seemed politically riskier.⁵¹ I argue that the reason the government chose peace is because of a high risk of an international conflict with Venezuela.

In the terms of the model, it is clear that just before the start of the peace talks, the strength of the government, G , was significantly greater than the strength of the rebels, \bar{R} (i.e. $G \gg \bar{R}$). According to Proposition 4, this should be sufficient for having $G > \bar{G}$. In Proposition 3, I showed that having $G > \bar{G}$ is not a sufficient condition for peace. There also needs to exist a possibility that the domestic conflict could externalize, and that the risk of such event, ϕ , is sufficiently high. The evidence suggests that these conditions existed in Colombia.

In subsection 3.4.1, I showed that just before Santos took power, the risk of an interstate conflict between Colombia and Venezuela was extremely high. This risk was directly related to the presence of the FARC in Venezuelan territory, the very likely possibility that Colombia might violate Venezuelan sovereignty to pursue the rebels, and Venezuela's determination to respond in the event this happened. Thus, in terms of the model, it is clear that ϕ was very high just before the start of the peace talks.

The theory proposed in Sections 2 and 3 is supported by the fact that Venezuela has played an important role in the peace process. Although four dif-

50. See Fearon (1995) and Jackson and Morelli (2011).

51. In the speech announcing the opening of peace talks, Santos said, "There comes a moment in history when you have to take risks to arrive at a solution.... This is one of those moments." (See (Presidencia de Colombia, 2012a, September 4, 2012), translation of the author).

ferent countries are officially “accompanying the process,”⁵² both the FARC and the Colombian government have recognized that Venezuela played a crucial role.⁵³ “Venezuela’s role here has been fundamental,” a member of the FARC peace delegation said. “Had it not been for Commander Chávez, the FARC would not have had the necessary confidence to talk.”⁵⁴

This “confidence” was so important that any difference between the two countries’ governments might put the talks in jeopardy. When the Venezuelan government announced that it might “rethink” its role in the peace process after a meeting between the Venezuelan opposition leader and the Colombian president, the peace process was in crisis; the FARC expressed very serious concerns about the future of negotiations, and the leader of the Colombian delegation said that the situation was “very worrying.”⁵⁵

But how did Venezuela give the FARC “confidence”? The source is likely not solely Venezuela’s *ideological* support. Cuba also participated in the process and is ideologically very close to the FARC, but has not been as influential. Given the precedents described in subsection 3.4.1, *geographical* proximity is likely what mattered. Colombian intelligence documents recently leaked are consistent with this hypothesis.⁵⁶ These documents, which Colombian government officials would have been aware of, show that the improvement in the relations between Colombia and Venezuela did not im-

52. The countries are Cuba, Chile, Norway and Venezuela (see Presidencia de Colombia 2013b, November 7, 2013).

53. The Colombian president stated, “If we go into a solid peace project, with clear and concrete progress, progress achieved ever before with the FARC, is also due to the dedication and commitment of Chavez and the government of Venezuela.” (see Presidencia de Colombia (2013a, March 5, 2013)). The FARC also emphasized the role played by Venezuela : “We ought to recognize the invaluable cooperation of the government of the Bolivarian Republic of Venezuela, at the head of Mister President Hugo Rafael Chávez Frías, which has been decisive to come to this Agreement.” (see FARC-EP, 2012).

54. See *Semanario voz* (2013, March 11), translation of the author.

55. See *Caracol Noticias* (2013).

56. See Davila (2014).

ply a deterioration in relations between Venezuela and the FARC; many of the FARC's top leaders, including Timochenko, may still be living in Venezuela. Also, an important number of FARC fronts still move along the border.⁵⁷ According to the same leak, the Venezuelan government was also aware of this information.

Thus, Venezuela's role in building the FARC's confidence is probably based on its support, which is not only ideological, but mostly material, given the geography of the conflict. This support makes it very difficult and extremely risky for the Colombian government to capture FARC leaders, as well as fight rebels moving along the border. The Colombian government knows this and, in particular, knows that despite its strength (i.e. $G > \bar{G}$), a victory for the government necessarily implies a risk of a conflict with Venezuela. Given Venezuela's commitment to respond to a violation of its sovereignty, this risk is very high (i.e. $\phi > \bar{\phi}$). Thus, the best response for the Colombian government is to tolerate the activities of the FARC along the border (i.e. $g(x) = p$ for $x \in \{a, p\}$); its probability of losing power is very low, provided that there is not an interstate conflict with Venezuela. Thus, as shown in Sections 2 and 3, this implies a peaceful outcome.

3.5 Conclusion

In this chapter, I develop a simple model of conflict externalization and provide new evidence from Colombia. The main contribution of the chapter is to show that the risk of externalization of a domestic conflict increases the likelihood of peace, but that this only happens if, on the one hand, the domestic government is sufficiently powerful relative to its opposition, and on the other hand, the risk of a foreign party intervening is sufficiently high.

⁵⁷. See Davila (2014, p. 103-116).

In the second part of the chapter, I use the model to examine the recent developments of the Colombian internal conflict. I focus on an attempt at peace negotiations, started in 2012, between the Colombian government and the FARC. I show that the risk of externalization of the conflict to Venezuela played crucial role in the onset and evolution of these peace talks.

Although the theory is inspired by the Colombian conflict, its application is not limited to this case. The argument can be applied to any internal conflict in which governments, undertaking cross-border counterinsurgency actions, initiate military actions against neighboring states. While other explanations exist to explain how Colombian peace talks evolved, such as less ideological extremism and less militarism from both parties, I argue that there is enough evidence to believe that the possibility of externalization should be taken into account in any discussion of the issue.

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Annexes

A Proof of main results in Chapter 1

A.1 Proof of proposition 1

Proof. In period 2 the incumbent solves the problem :

$$\max_{g_2} 1 - (g_t + r)\eta^{-1} + T + H(g_2) + R + (g_t + r)(1 - \eta)\eta^{-1} \quad (3.6)$$

subject to $g_2 \geq 0$ and $(g_t + r)\eta^{-1} - T = x_2 \geq 0$. Let λ_g and λ_x be the Lagrange multipliers of these restrictions ; then the first-order condition (sufficient since $H'' < 0$) of (3.6) is given by

$$H'(g_2^*) - 1 + \lambda_g + \lambda_x \eta^{-1} = 0 \quad (3.7)$$

with $\lambda_g \geq 0$, $\lambda_x \geq 0$, $\lambda_g g_2 = 0$ and $\lambda_x((g_t + r)\eta^{-1} - T) = 0$. Note that if $\lambda_g > 0$, then $g_2^* = 0$. This is not possible since $\lim_{x \rightarrow 0} H'(x) = +\infty$. If $\lambda_x > 0$, we have that $(g_2^* + r)\eta^{-1} - T = 0$. Since $T = 0$ if $x_2 = 0$, this implies that $(g_2^* + r)\eta^{-1} = 0$, which is also impossible. Then $\lambda_g = 0$ and $\lambda_x = 0$, which by (3.7) implies (1.7), where we assume that T and r are such that $H'^{-1}(1) + r - T \geq 0$.

The probability that the incumbent is reelected is given by

$$Pr\left(\tilde{\eta} > \frac{1}{\xi'}\right) = \frac{1}{2} + \psi\left(\frac{1}{\xi} - \frac{g_1 + r}{\xi'(\tilde{g}_1 + r)}\right) \quad (3.8)$$

where ξ' is the expected level of honesty of the challenger (note that if $\xi = \xi'$, (1.11) and (3.8) are the same). In period 1 the incumbent solves

$$\max_{g_1 \geq 0} E[v(g_1; \eta)] + Pr\left(\tilde{\eta} > \frac{1}{\xi'}\right) E[v(g_2^*; \eta)] + \left(1 - Pr\left(\tilde{\eta} > \frac{1}{\xi'}\right)\right) E[w(g_2^*; \eta')] \quad (3.9)$$

subject to (1.1), (1.7) and (3.8), and also to $(g_t + r)\eta^{-1} - T = x_1 \geq 0$. Since g_2^* does not depend on η , we can write

$$\begin{aligned} E[w(g_2^*; \eta')] &= 1 - E\left[\frac{1}{\eta'}\right](g_2^* + r) + T + H(g_2^*) \\ &= 1 - \xi'(g_2^* + r) + T + H(g_2^*) \end{aligned} \quad (3.10)$$

Additionally, for $t = 1, 2$,

$$\begin{aligned} E[v(g_t; \eta)] &= E[w(g_t; \eta)] + R + (\xi - 1)(g_t + r) \\ &= 1 - \xi(g_t + r) + T + H(g_t) + R + (\xi - 1)(g_t + r) \\ &= 1 + T + H(g_t) + R - g_t - r \end{aligned} \quad (3.11)$$

Let us define $A = R + (\xi' - 1)(g_2^* + r)$, then by replacing (3.10), (3.11) and (1.11) in (1.12) we get

$$\max_{g_1} 1 + T + H(g_1) + R - g_1 - r + A \left(\frac{1}{2} + \psi\left(\frac{1}{\xi} - \frac{g_1 + r}{\xi'(\tilde{g}_1 + r)}\right)\right) + E[w(g_2^*; \eta')] \quad (3.12)$$

subject to $g_1 \geq 0$ and $\xi(g_1 + r) - T = x_1 \geq 0$. Let λ_g and λ_x be the Lagrange multipliers of these restrictions; then the first-order condition of (3.12) is

$$H'(g_1^*) - 1 - \frac{A\psi}{\xi'(\tilde{g}_1 + r)} + \lambda_g + \lambda_x \xi = 0 \quad (3.13)$$

with $\lambda_g \geq 0$, $\lambda_x \geq 0$, $\lambda_g g_1 = 0$ and $\lambda_x(\xi(g_1 + r) - T) = 0$. Again we can note that $\lambda_g > 0$ is impossible since $\lim_{x \rightarrow 0} H'(x) = +\infty$, and that $\lambda_x > 0$ is also impossible since it would imply that $T = 0$, which does not satisfy $\xi(g_1 + r) - T = 0$ since by assumption $\xi > 1$ and $r > 0$. Then $\lambda_g = 0$ and $\lambda_x = 0$, and in equilibrium, $g_1^* = \tilde{g}_1$. Now I show that this equilibrium exists and is unique. Replace $g_1^* = \tilde{g}_1$ in (3.13), and define the function

$$f(x) = H'(x) - 1 - \frac{A\psi}{\xi'(x + r)} \quad (3.14)$$

I need to show that there exists an $x^* > 0$ such that $f(x^*) = 0$ (by (3.13) and (3.14) true in any equilibrium) and that this x^* is unique. The proof of the existence is straightforward. First observe in (3.14) that $\lim_{x \rightarrow 0} f(x) = +\infty$ and that $f(x)$ is continuous. This implies that it is sufficient to have an $x' > 0$ such that $f(x') \leq 0$. Choose $x' = H'^{-1}(1) > 0$. Replacing this value in (3.14) we get

$$\begin{aligned} f(H'^{-1}(1)) &= H'(H'^{-1}(1)) - 1 - \frac{A\psi}{\xi'(H'^{-1}(1) + r)} \\ &= -\frac{A\psi}{\xi'(H'^{-1}(1) + r)} \\ &< 0 \end{aligned} \quad (3.15)$$

So from (3.15) there exists at least one $x > 0$ such that $f(x) = 0$.

For the unicity, we proceed by contradiction. Suppose that there exist at least two numbers $a > 0$ and $b > 0$ such that $f(a) = f(b) = 0$ and

$a \neq b$. Without a loss of generality, suppose that $a < b < y$, where y is any other number such that $f(y) = 0$. Since $\lim_{x \rightarrow 0} f(x) = +\infty > 0$ and $f(x)$ is continuous, there must be a neighbourhood of a , N_a , such that $f'(x) < 0$ for all $x \in N_a$, and a neighbourhood of b , N_b such that $f'(x) > 0$ for all $x \in N_b$. Since $b \in N_b$, this implies that $f'(b) > 0$. Differentiating $f(x)$ in (3.14) we get

$$f'(x) = H''(x) + \frac{A\psi}{\xi'(x+r)^2} \quad (3.16)$$

and since $f'(b) > 0$, by (3.16) we must have that

$$H''(b) + \frac{A\psi}{\xi'(b+r)^2} > 0 \quad (3.17)$$

Multiplying and dividing the first term of (3.17) by b and $\frac{1}{H'(b)}$, and using the definition of κ in (2.27), (3.17) is equivalent to

$$-\kappa(b)\frac{H'(b)}{b} + \frac{A\psi}{\xi'(b+r)^2} > 0 \quad (3.18)$$

Additionally, since by assumption $f(b) = 0$, by (3.14) we have $A\psi = \xi'(b+r)(H'(b) - 1)$. Thus replacing $A\psi$ in (3.18) and rearranging we get

$$\begin{aligned} -\kappa(b)\frac{H'(b)}{b} + \frac{H'(b) - 1}{b+r} &= -\kappa(b)\frac{H'(b)}{b} + \frac{H'(b)}{b+r} - \frac{1}{b+r} \\ &= -H'(b) \left(\frac{\kappa(b)}{b} - \frac{1}{b+r} \right) - \frac{1}{b+r} \\ &> 0 \end{aligned} \quad (3.19)$$

Since by assumption $r > 0$, $b \geq 0$ and $H'(x) > 0$ for all x , (3.19) can only be satisfied if the expression in parentheses is less than zero. If this is the case, then

$$\kappa(b) < \frac{b}{b+r} < 1 \quad (3.20)$$

But (3.20) contradicts (2.27), true for all x , particularly for $x = b$. Thus we cannot have $a \neq b$ such that $f(a) = f(b) = 0$. The solution has to be unique. \square

A.2 Proof of corollary 1

Proof. We are interested in seeing how g_1^* changes with respect to the parameter ψ . We use the implicit function theorem. Let's define the function

$$h(\psi, x) = f(x) = H'(x) - 1 - \frac{A\psi}{\xi'(x+r)} \quad (3.21)$$

Differentiating $h(\psi, x)$ in (3.21) with respect to x , we have that

$$\frac{\partial h}{\partial x} = f'(x) = H''(x) + \frac{A\psi}{\xi'(x+r)^2} \quad (3.22)$$

Additionally, we know that in equilibrium $h(\psi, g_1^*) = f(g_1^*) = 0$. As we saw before, this implies that $A\psi = \xi'(g_1^*+r)(H'(g_1^*)-1)$. Replacing this expression in (3.22), multiplying and dividing the first term by g_1^* and $\frac{1}{H'(g_1^*)}$, using again the definition of κ in (2.27), and rearranging, we have that in equilibrium,

$$\begin{aligned} \frac{\partial h}{\partial g_1^*} &= H''(g_1^*) + \frac{A\psi}{\xi'(g_1^*+r)^2} \\ &= -\kappa(g_1^*) \frac{H'(g_1^*)}{g_1^*} + \frac{H'(g_1^*)}{g_1^*+r} - \frac{1}{g_1^*+r} \\ &= -H'(g_1^*) \left(\frac{\kappa(g_1^*)}{g_1^*} - \frac{1}{g_1^*+r} \right) - \frac{1}{g_1^*+r} \\ &< 0 \end{aligned} \quad (3.23)$$

where in the inequality, as in the proof of the proposition 1, we used (2.27) (that $\kappa(g_1^*) \geq 1$) to show that the term in parentheses in (3.23) is greater than zero. Additionally, differentiating $h(\psi, x)$ in (3.21) with respect to ψ ,

we have that that in equilibrium,

$$\frac{\partial h}{\partial \psi} = -\frac{A}{\xi'(g_1^* + r)} < 0 \quad (3.24)$$

By combining (3.23) and (3.24) and using the implicit function theorem, we have that

$$\frac{\partial g_1^*}{\partial \psi} = -\frac{\frac{\partial h}{\partial \psi^i}}{\frac{\partial h}{\partial g_1^*}} < 0$$

□

B Proof of main results in Chapter 2

B.1 Proof of Proposition 1

Proof. From (2.24) we have that

$$\frac{\partial \phi}{\partial \alpha} = E[\Delta t'_O] + E[t_F] + (\alpha \Delta \phi_F + E[\Delta t_O]) \frac{\partial p}{\partial \alpha} \quad (3.25)$$

with $E[t_F]$ is given by (2.23), and

$$E[\Delta t'_O] = p(\phi_O^{aw} - \phi_O^{pw}) + (1 - p)(\phi_O^{ap} - \phi_O^{pp}) \quad (3.26)$$

Differentiating (2.20) with respect of α , we have that for $p \in (0, 1)$,

$$\frac{\partial p}{\partial \alpha} = -\frac{1}{\bar{\sigma}} \left(\frac{\Delta \phi_F (1 - \sigma^2) \Delta \phi_O^p}{(\alpha \Delta \phi_F + (1 - \sigma) E[\Delta t_O])^2} \right) \quad (3.27)$$

provided that $\alpha \Delta \phi_F + (1 - \sigma) E[\Delta t_O] > 0$. For the case $\alpha \Delta \phi_F + (1 - \sigma) E[\Delta t_O] \leq 0$, or for $p \in \{0, 1\}$, $\frac{\partial p}{\partial \alpha} = 0$.

In order to simplify the notation, Let's define

$$\Theta \equiv \alpha \Delta \phi_F + (1 - \sigma) E[\Delta t_O] \quad (3.28)$$

Replacing (2.20), (3.27) and (3.28) in (3.25), and rearranging, we have that for $\Theta > 0$ and $p \in (0, 1)$

$$\begin{aligned} \frac{\partial \phi}{\partial \alpha} = & \phi_O^{ap} - \phi_O^{pp} + \phi_F^{ap} + \frac{[\bar{\sigma}\Theta - (\alpha\sigma\Delta\phi_F - (1-\sigma)E[\Delta t_O])][\Delta\phi_O^a - \Delta\phi_O^p + \Delta\phi_F]}{\bar{\sigma}\Theta} \\ & - \frac{(\alpha\Delta\phi_F + E[\Delta t_O])(\Delta\phi_F(1-\sigma^2)\Delta\phi_O^p)}{\bar{\sigma}\Theta^2} \end{aligned} \quad (3.29)$$

which, rearranging, is equivalent to

$$\frac{\partial \phi}{\partial \alpha} = \frac{1}{\bar{\sigma}\Theta^2} \left[\Theta^2(\bar{\sigma}(H) + \Delta\phi_O^a - \Delta\phi_O^p) - \sigma\Delta\phi_F \left(\Theta^2 + \alpha(\Delta\phi_O^a - \Delta\phi_O^p)(1+\sigma)\Theta + (1-\sigma^2)\Delta\phi_O^p E[\Delta t_O] \right) \right]$$

with $H = \phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw}$. Since $\frac{\partial \phi}{\partial \alpha} \geq 0$ depending on the sign of the term in parenthesis, thus for $p \in (0, 1)$ we have that $\frac{\partial \phi}{\partial \alpha} \geq 0$ if and only if

$$\bar{\sigma} \geq \sigma \left[\frac{\Delta\phi_F}{\phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw}} \right] \left[1 + \frac{\alpha^2(1+\sigma)(\Delta\phi_O^a - \Delta\phi_O^p)\Delta\phi_F + (1-\sigma^2)(E[\Delta t_O])^2}{(\alpha\Delta\phi_F + (1-\sigma)E[\Delta t_O])^2} \right] - \frac{(\Delta\phi_O^a - \Delta\phi_O^p)}{(\phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw})} \quad (3.30)$$

and with β , γ and κ as defined in (2.26), (2.28) and (2.27), respectively, we have the result.

For $p = 1$, replacing this value in (3.25) we have that $\frac{\partial \phi}{\partial \alpha} = \phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw}$, which is always positive by (2.7). For $p = 0$, we have that $\frac{\partial \phi}{\partial \alpha} = \phi_O^{ap} - \phi_O^{pp} + \phi_F^{ap}$.

□

B.2 Proof of Proposition 2

Proof. From (2.46), we have that $\frac{\partial r_2}{\partial \alpha} \geq 0$ if and only if

$$-(1 - \sigma)E[\Delta t'_O] - E[t_F] - \Theta \frac{\partial p}{\partial \alpha} \geq 0 \quad (3.31)$$

where $E[t_F]$, $E[\Delta t'_O]$ and Θ are given by (3.26), (2.23) and (3.28) respectively. Replacing (2.20) and (3.27) in (3.31), and rearranging, we have that for $\Theta > 0$,

$$\begin{aligned} -(1 - \sigma)E[\Delta t'_O] - E[t_F] - \Theta \frac{\partial p}{\partial \alpha} &= \frac{1}{\bar{\sigma}\Theta} \left[-\bar{\sigma}\Theta((1 - \sigma)(\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw}) \right. \\ &\quad \left. + \Delta\phi_F \left(\alpha\sigma\Delta\phi_F + (1 - \sigma)\sigma(\alpha(\Delta\phi_O^a - \Delta\phi_O^p) + \Delta\phi_O^p) \right. \right. \\ &\quad \left. \left. - (1 - \sigma)\alpha(\Delta\phi_O^a - \Delta\phi_O^p) \right) \right] \\ &= \frac{-\bar{\sigma}((1 - \sigma)(\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw}) - (1 - \sigma)(\Delta\phi_O^a - \Delta\phi_O^p) + \sigma\Delta\phi_F}{\bar{\sigma}} \end{aligned}$$

which implies that $-(1 - \sigma)E[\Delta t'_O] - E[t_F] - \Theta \frac{\partial p}{\partial \alpha} \geq 0$ if and only if

$$\bar{\sigma} \leq \sigma \left[\frac{\Delta\phi_F}{(1 - \sigma)(\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw}} \right] - \frac{(1 - \sigma)(\Delta\phi_O^a - \Delta\phi_O^p)}{(1 - \sigma)(\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw}} \quad (3.32)$$

and with β^σ and γ^σ as defined in (2.49) and (2.50), respectively, we have the result.

For $p = 1$, we have that (2.46) is equivalent to $-(1 - \sigma)(\phi_O^{aw} - \phi_O^{pw}) - \phi_F^w$, which is always negative by (2.7). For $p = 0$, (2.46) is equivalent to $-(1 - \sigma)(\phi_O^{ap} - \phi_O^{pp}) - \phi_F^p$

□

B.3 Proof of Proposition 3

Proof. I show that there is a $\sigma^* \in [0, 1)$ such that $\Sigma^0 \geq \Sigma^1$ for all $\sigma \in (\sigma^*, 1)$. Note that $\Sigma^0 \geq \Sigma^1$ implies (3.A) and (3.B). For the case $p \in (0, 1)$, recall that Σ^0 and Σ^1 were defined in (2.29) and (2.51) as

$$\Sigma^0 = \sigma\beta\kappa - \gamma \quad (3.33)$$

$$\Sigma^1 = \sigma\beta^\sigma - \gamma^\sigma \quad (3.34)$$

where $\kappa, \beta, \beta^\sigma, \gamma$ and γ^σ are given by (2.27), (2.26), (2.49), (2.28) and (2.50), respectively. Combining (3.33) and (3.34), note that $\Sigma^0 \geq \Sigma^1$ is equivalent to

$$\sigma(\beta\kappa - \beta^\sigma) - (\gamma - \gamma^\sigma) \geq 0 \quad (3.35)$$

In order to simplify the notation, let define

$$X = \phi_O^{aw} - \phi_O^{pw} + \phi_F^{aw} \quad (3.36)$$

$$Y(\sigma) = (1 - \sigma)(\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw} \quad (3.37)$$

$$M(\sigma) = \alpha^2(1 + \sigma)(\Delta\phi_O^a - \Delta\phi_O^p)\Delta\phi_F + (1 - \sigma^2)(E[\Delta t_O])^2 \quad (3.38)$$

Let's note that

$$\sigma(\beta\kappa - \beta^\sigma) - (\gamma - \gamma^\sigma) = \frac{\sigma}{\Theta^2 XY} \left[\Delta\phi_F MY - \Theta^2 [\Delta\phi_F(X - Y) + \phi_F^{aw}(\Delta\phi_O^a - \Delta\phi_O^p)] \right] \quad (3.39)$$

where Θ is given by (3.28). Let's define now the function

$$f(\sigma) \equiv \Delta\phi_F M(\sigma)Y(\sigma) - \Theta(\sigma)^2 [\Delta\phi_F(X - Y(\sigma)) + \phi_F^{aw}(\Delta\phi_O^a - \Delta\phi_O^p)] \quad (3.40)$$

It is easy to see that (3.35) is satisfied if and only if $f(\sigma) \geq 0$. The idea is to show that there is a $\sigma^* \in (0, 1)$ such that $f(\sigma) \geq 0$ for all $\sigma > \sigma^*$.

In order to do that, first, Let's note that

$$\lim_{\sigma \rightarrow 1} f(\sigma) = (\alpha \Delta \phi_F)^2 \left[\phi_F^{ap} (\phi_O^{aw} - \phi_O^{pw}) + \phi_F^{aw} (\phi_O^{pp} - \phi_O^{ap}) \right] \geq 0 \quad (3.41)$$

where I have used assumptions (2.7) and (2.8). Note that the inequality is strict if $\alpha > 0$ and $\Delta \phi_F > 0$, and $\phi_F^{ap} (\phi_O^{aw} - \phi_O^{pw}) > 0$ or $\phi_F^{aw} (\phi_O^{pp} - \phi_O^{ap}) > 0$. Let's assume that this happens.

Let's note now that (3.41) implies that we have only two scenarios. First, that $f(\cdot)$ never crosses the x-axis. Since $\lim_{\sigma \rightarrow 1} f(\sigma) \geq 0$, and since $f(\cdot)$ is continuous, we have that $f(\sigma) \geq 0$ for all $\sigma \in (0, 1)$. For this case we can take as σ^* any $\sigma \in (0, 1)$.

Second, Let's consider the case that $f(\cdot)$ crosses the x-axis at least one. Let's call Ξ the set of points such that this happens, i.e., that $f(\sigma) = 0$ for all $\sigma \in \Xi$. Let's take the supremum of Ξ . Let's call this value $\sigma^0 = \sup(\Xi)$. Note that $\sup(\Xi) \in \Xi$ if (3.41) is strict. Crucially, the definition of σ^0 , the continuity of $f(\cdot)$, and (3.41), implies that $f(\sigma) \geq 0$ for all $\sigma \in (\sigma^0, 1)$. Thus, Let's just take $\sigma^* = \sigma^0$. Then $f(\sigma) \geq 0$ for all $\sigma \in (\sigma^*, 1)$, which implies that (3.35) is satisfied, and equivalently, that $\Sigma^0 \geq \Sigma^1$ for all $\sigma \in (\sigma^*, 1)$. \square

C Proof of main results in Chapter 3

C.1 Proof of Proposition 1

Proof. We know that $r(a) = a$ and $g(a) = a$. Thus, war (i.e. (a, a)) is a NE. We first show that $r(p) = p$, then that $g(p) = p$, both implying that peace (i.e. (p, p)) is a NE too.

Let's define the functions l , m and s , as

$$\rho(G, L) = Z(G) - Z(G - L) - C \quad (3.42)$$

$$\zeta(G, L, F, \phi) = \phi Z(G - F) + (1 - \phi)Z(G) - Z(G - L) \quad (3.43)$$

$$\eta(G, L, F, \phi) = \phi Z(G + L - F) + (1 - \phi)Z(G + L) - Z(G) - C \quad (3.44)$$

These functions are constructed directly from Table 3.1, by comparing each player's choices. The sign of each function determines the corresponding best response. Specifically,

$$r(p) = p \Leftrightarrow \rho < 0 \quad (3.45)$$

$$g(p) = p \Leftrightarrow \eta < 0 \quad (3.46)$$

$$g(a) = p \Leftrightarrow \zeta < 0 \quad (3.47)$$

By (3.45) and (3.46), note that (p, p) is a NE when $\rho < 0$ and $\eta < 0$; by (3.3) and (3.47), (a, a) is a NE when $\zeta > 0$; and by (3.45) and (3.47), (p, a) is a NE when $\rho > 0$ and $\zeta < 0$. Also note that (p, p) can be unique only when, in addition to $\rho < 0$ and $\eta < 0$, we have $\zeta < 0$.

A close look at $\rho(G, L)$ in (3.42) shows that, with respect to G , ρ is inverse U-shaped with an unique maximum at L . To see this, note in (3.42) that for $G < L$, $\rho(G, L) = Z(G) - C$, since $Z(x) = 0$ for all $x < 0$. Thus, since by Assumption 2, $Z' > 0$, we have that $\rho_G(G, L) = Z'(G) > 0$ for all $G < L$. For $G > L$, note that $\rho_G(G, L) = Z'(G) - Z'(G - L) < 0$, since by Assumption 2, $Z'' < 0$.

Let us now look at $r(p) = p$, which we noted is implied by Assumption 3. To see this, note first that $Pr[R > L] = 1 - Pr[L > R] = 1 - Z(L)$. Replacing this expression in Assumption 3.(ii), we get $Z(L) - C \leq 0$. Then observing that since $\rho(L, L) = Z(L) - C \leq 0$, and $\rho(G, L)$ has a (unique) maximum at $G = L$, we have $0 \geq \rho(L, L) > \rho(G, L)$ for all $G > L$. Thus,

$0 \geq \rho(G, L)$, which by (3.45) implies that $r(p) = p$.

Finally, $g(p) = p$ follows from Assumption 2 and Assumption 3.(ii), by noting that from both (3.42) and (3.44), we have that $\rho(G, L) < 0 \Rightarrow \eta(G, L, \cdot, 0) < 0$. Since we already found that $\rho(G, L) < 0$, by (3.46), we have the result. To see this, note that $\eta(G, L, \cdot, 0) < \rho(G, L)$ if and only if

$$Z(G + L) + Z(G - L) < 2Z(G)$$

and by the strict concavity of Z (Assumption 2), we have that

$$\frac{Z(G + L)}{2} + \frac{Z(G - L)}{2} < Z\left(\frac{(G + L)}{2} + \frac{(G - L)}{2}\right) = Z(G)$$

□

C.2 Proof of Proposition 2

Proof. Let $\phi \rightarrow 1$ in (3.43) and (3.44). First, note that this implies that $\zeta < 0$ and $\eta < 0$, because $Z' > 0$ and $F > L$ by Assumptions 2 and 4 respectively. Thus, by (3.46) and (3.47) we have that : (i) $g(p) = p$; this implies that (p, p) is an equilibrium (since by Assumptions 2 and 3 we know that $r(p) = p$); and (ii) $g(a) = p$; this guarantees that (p, p) is unique (since the other possible equilibrium was (a, a)). □

C.3 Proof of Proposition 3

Proof. We show that (p, p) exists, and then we establish the conditions under which it is unique. The proof for the existence of (p, p) is as follows. Note that by (3.46), it is sufficient to show that $\eta(G, L, F, \phi) < 0$, which implies that $g(p) = p$, since we know that $r(p) = p$. Re-writing (3.44), we have that

$\eta(G, L, F, \phi) < 0$ is equivalent to

$$\phi > \frac{Z(G+L) - Z(G) - C}{Z(G+L) - Z(G+L-F)} \quad (3.48)$$

Note that (3.48) is always true since the term on the right is negative. To see this, note that the numerator of the expression on the right is equal to $\eta(G, L, \cdot, 0) < 0$, and as shown in the proof of Proposition 1, $\rho(G, L) < 0 \Rightarrow \eta(G, L, \cdot, 0) < 0$.

I now establish the conditions for the existence of an equilibrium of (a, a) . Note that (a, a) exists if and only if $g(a) = a$, which by (3.47) is equivalent to $\zeta(G, \phi) \geq 0$. Equivalently, (p, p) is unique if and only if $g(a) = p$ which by (3.47) is equivalent to $\zeta(G, L, F, \phi) < 0$. I first show that if ϕ is large enough, there exists a unique cut off point $\bar{G}(\phi, L, F)$ implicitly defined by $\zeta(\bar{G}, L, F, \phi) = 0$, such that $\zeta(G, L, F, \phi) < 0$ for all $G > \bar{G}$, and $\zeta(G, L, F, \phi) \geq 0$ for all $G \leq \bar{G}$.

To establish the existence of \bar{G} , let us define the following threshold for ϕ

$$\bar{\phi} = 1 - \frac{Z(F-L)}{Z(F)} \quad (3.49)$$

I argue that \bar{G} exists if and only if $\phi > \bar{\phi}$. Note that by (3.44), the condition $\phi > \bar{\phi}$ is equivalent to $\zeta(F, L, F, \phi) < 0$. Thus, $\phi < \bar{\phi}$ implies that $\zeta(F, L, F, \phi) \geq 0$. If $\phi > \bar{\phi}$, the proof that there is a unique \bar{G} such that $\zeta(\bar{G}, L, F, \phi) = 0$ is as follows.

First, note that $\zeta(L, L, F, \phi) > 0$. To see this, note that $F > L$ (true by

Assumption 4) and Assumption 2 implies that

$$\begin{aligned}
\zeta(L, L, F, \phi) &= \phi Z(L - F) + (1 - \phi)Z(L) - Z(L - L) \\
&= (1 - \phi)Z(L) \\
&> 0
\end{aligned}$$

Second, note that $\zeta(G, L, F, \phi)$ is strictly decreasing in G for $L < G \leq F$. This follows directly from the fact that $Z(G - F) = 0$ and Assumption 2. Differentiating $\zeta(G, L, F, \phi)$ with respect to G , we get

$$\zeta_G(G, L, F, \phi) = (1 - \phi)z(G) - z(G - L)$$

and by Assumption 2, $z(G - L) > z(G)$, so $\zeta_G(G, L, F, \phi) < 0$. Third, recall that $\phi > \bar{\phi}$ implies $\zeta(F, L, F, \phi) < 0$.

We can now argue that \bar{G} exists and is unique for $\phi > \bar{\phi}$: $\zeta(L, L, F, \phi) > 0$, $\zeta(F, L, F, \phi) < 0$, $\zeta_G(G, L, F, \phi) < 0$ for $L < G \leq F$ and the continuity of ζ with respect to G implies that there exists a unique \bar{G} such that $\zeta(\bar{G}, L, F, \phi) = 0$ for $L < G \leq F$. Note that $L < \bar{G} \leq F$. Note also that $\zeta_G(G, L, F, \phi) < 0$ implies that $\zeta(G, L, F, \phi) < 0$ for all $G > \bar{G}$.

We have shown that if $\phi > \bar{\phi}$, there is a unique \bar{G} such that $\zeta(G, L, F, \phi) < 0$ for all $G > \bar{G}$. We now prove that if $\phi \leq \bar{\phi}$, or if $\phi > \bar{\phi}$ but $G \leq \bar{G}$, then $\zeta(G, L, F, \phi) \geq 0$. The proof is straightforward. Since $\zeta(G, L, F, \phi)$ is strictly decreasing for all $L < G \leq F$, the fact that $L < \bar{G} \leq F$ implies that $\zeta(G, L, F, \phi) \geq 0$ for all $G \leq \bar{G}$. Now suppose that $\phi \leq \bar{\phi}$. Note that by (3.49), this implies that $\zeta(F, L, F, \phi) \geq 0$. For $L < G \leq F$, since $\zeta(G, L, F, \phi)$ is strictly decreasing with a minimum at $G = F$, thus $\zeta(G, L, F, \phi) \geq 0$.

We conclude that (i) if $G > \bar{G}$ and $\phi > \bar{\phi}$, $g(p) = p$, $g(a) = p$, $r(p) = p$, which implies that (p, p) is unique; (ii) if $\phi \leq \bar{\phi}$ or $\phi > \bar{\phi}$ but $G < \bar{G}$, we

have two equilibria, (a, a) and (p, p) .

□

C.4 Proof of Proposition 4

Proof. For the case $L \geq \bar{R}$, it is trivially true that $\bar{G} > \bar{R}$; by Assumption 3, $G > L$ for all G , particularly for \bar{G} . For $L < \bar{R}$, it is crucial that \bar{G} is a function of ϕ . Note that $\phi \geq \bar{\phi}$, since for $\phi < \bar{\phi}$, \bar{G} might not exist.

Let's first assume that $\bar{R} < F$. Note that in (3.43), taking the limit when $\phi \rightarrow 1$, we have, by Assumptions 2 to 5, that $\lim_{\phi \rightarrow 1} \bar{G}(\phi, L, F) \leq L$. Also note that \bar{G} is strictly decreasing in ϕ (see proof of Corollary 1). Then there is a $\phi'' \geq \bar{\phi}$ such that $\bar{G}(\phi'', L, F) = F$. Thus, since by the continuity of ζ , $\bar{G}(\phi, L, F)$ is continuous in ϕ , and there exists a $\phi^* \geq \bar{\phi}$ such that $\bar{G}(\phi^*, L, F) = \bar{R}$. Let's choose $\phi' = \phi^*$. As a result, since \bar{G} is strictly decreasing in ϕ , for all $\phi > \phi'$, we have that $\bar{G}(\phi, L, F) < \bar{G}(\phi', L, F) = \bar{R}$ and for all $\phi \leq \phi'$, we have that $\bar{G}(\phi, L, F) \geq \bar{G}(\phi', L, F) = \bar{R}$; thus, we have the result. The case $\bar{R} > F$ is trivial since by Assumption 5, $F > G$ for all G , particularly \bar{G} ; in this case, it is sufficient to take $\phi' = \bar{\phi}$. □

C.5 Proof of Corollaries 1 and 2

Proof. The proof is a direct application of the implicit function theorem.

Note that by the definitions of $\zeta(G, L, F, \phi)$ and \bar{G} ,

$$\frac{\partial \bar{G}}{\partial \phi} = \frac{-\frac{\partial \zeta}{\partial \phi}}{\frac{\partial \zeta}{\partial \bar{G}}} = \frac{Z(\bar{G}) - Z(\bar{G} - F)}{(1 - \phi)z(\bar{G}) - z(\bar{G} - L)} < 0$$

and

$$\frac{\partial \bar{G}}{\partial L} = \frac{-\frac{\partial \zeta}{\partial L}}{\frac{\partial \zeta}{\partial \bar{G}}} = -\frac{z(G - L)}{(1 - \phi)z(\bar{G}) - z(\bar{G} - L)} > 0$$

and finally, differentiating (3.49), we get

$$\frac{\partial \bar{\phi}}{\partial L} = \frac{z(F-L)}{Z(F)} > 0$$

$$\frac{\partial \bar{\phi}}{\partial F} = \frac{z(F)Z(F-L) - z(F-L)Z(F)}{(Z(F))^2} < 0$$

where the second relation is true since $Z'' < 0$ implies that $\frac{z(x)}{Z(x)}$ is monotone decreasing, so the numerator is negative. \square

