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Institutional Reforms, Federal Transfers, and Subnational Taxation

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Under the Supervision of Prof. Christopher Heady and Dr. Anirban Mitra

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To my grandma (Pirincha) and my great-grandma (Lica).

Declaration

I hereby declare that this thesis is fruit of my own work, as are all errors and omissions. The copyright of this thesis rests with the author. This thesis consists of about 60,900 words.

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Abstract

Although Argentina does not rank badly in democratic indexes[1], actual levels of institutional quality in subnational units do not always scale down evenly. Some Argentinian provinces and municipalities are truly obscure places in terms of law enforcement, bureaucratic effectiveness, and state accountability. This thesis explores channels leading to these pervasive institutional characteristics. I argue that some of these particularities can be rooted in subnational socio-economic and fiscal conditions. In the first two chapters I broadly analyse unintended consequences from the Federal Tax-sharing Agreement (FTSA) in Argentina. The FTSA, or *"Coparticipation"*, is the building block of subnational finances, both for provinces and for municipalities. I posit that the current system generates a number of effects, ranging from allowing mayors to rely on opaque tax structures, to facilitating constitutional reforms to relax term limits in some provinces. In the last chapter, this appetite for constitutional tailoring is further explored for Municipal Charters (MC), connecting it to local levels of socio-economic segregation and spatial inequality.

In the first chapter, the link between fiscal resource abundance and constitutional reforms in Argentinian provinces is studied. I assert that fiscal (dis)organisation, in the form of a careless FTSA, can have long-lasting repercussions. One particular feature of provincial constitutions is closely traced: term limits. Using a formal theoretical model, a political agency set-up is considered where term limits are endogenous to federal transfers. Argentina provides us with a natural experiment to assess this. In 1983, after more than 50 years of institutional instability, provincial constitutions limited governors from running for re-election. These exogenous term limits were inconvenient for many of these newly appointed governors. Exploiting the timing of reforms, I suggest that those jurisdictions with higher shares of FTSA per capita were among the first to reform constitutions to relax term limits.

The second chapter explores yet another channel by which unearned revenues can affect institutional settings. In this case, I examine the impact of windfall-like federal transfers received from the Federal Solidarity Fund on the tax structure of municipalities in Argentina after 2009. To better internalise the idea of revenue substitution, I use a career concern model where the mayor, running for re-election, can mask her ability relying on non-transparent tax bases. The emerging theoretical propositions are then tested. By collecting a panel of 428 local governments over 2006-2017, I employ the design of FFS distribution, based on fixed two-decades-old coefficients set in the FTSA, to apply event case difference-in-differences. The main findings indicate that local mayors who disproportionally benefited from FFS funds reacted by reducing and substituting direct visible taxes.

Finally, the third chapter assesses the effect of local socio-economic segregation on the probability of sanctioning Municipal Charters (MC) in Argentinian municipalities. To identify the effect, I rely on the differential time gaps (in years) between the plausibly

[1] 9 out of 10 (for full democracy) in the *Political Regime Score* by Roser (2019).

exogenous recognition of municipal autonomy, granted by provincial constitutional reform, and the year when the municipality sanctioned its Municipal Charter. For that purpose, I calculate the Gini Segregation Index (G) and Information Theory Index (H) using Census 2001 and 2010 data. Duration analysis is then applied to the 178 municipalities that have adopted an MC out of more than 400 eligible. This allows us to explore the relationship between local spatial inequality and the likelihood of having an MC. The findings seem to support that economic segregation in education levels, poverty and unsatisfied basic needs is correlated to adopting an MC in municipalities in Argentina.

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Introduction

In November 2001, while Argentina was plunging deep into one of its most notorious recessions, in the province of San Luis a brand-new football stadium was being built. In a province not particularly strong in football, with no team placed in the first, second or third tier in national leagues, this project seemed grandiloquent. Surely, with poverty levels reaching 61% in the region, there must had been better places to allocate the provincial budget. To the casual observer, it must have been odd to see that while the country was undergoing political and economic turmoil, in this province everything seemed to be under control. Without knowing, this onlooker was witnessing the workings of an illiberal democratic regime; latent corruption, co-partisanship subdued, manipulated judiciary, and non-existent term limits.

Subnational authoritarian enclaves blended in democratic countries have been carefully studied in the literature (O'Donnell (1993), Giraudy (2010), Gibson (2005), Gervasoni (2010, 2018), Behrend (2011), Behrend and Bianchi (2017)). However, the causes of continuity or reproduction of such "hybrid regimes" are less well understood. For instance, Behrend (2011) studies "closed games" in Argentinian provinces, defined as cases where a family (or group) controls key provincial democratic institutions (local legislature, media, etc). These games follow a very distinct logic, and its reproduction cannot be easily halted, neither by alternation in power (where new incumbents adopt not-so-different behaviour) or by federal intervention. Alternatively, Giraudy (2010) argues that these subnational undemocratic regimes survive because they serve national incumbents' strategic political interests. From a more financial perspective, Gervasoni (2010, 2018) links their survival to the disproportional fiscal rents easily available to some governors (mainly in the form of federal transfers). Either political connections or economic advantages allow these regimes to have mechanisms that sustain their power. These ideas embody the main drivers of this thesis. The fiscal channel is explored in the first two chapters; in the first one, we note that such reproduction was institutionally blocked in provinces after 1983, as governors were term-limited and re-election banned. Similarly, in the second chapter, we show how municipal budgets rely heavily on supra-municipal transfers and how that tilts municipal finances towards opaque tax instruments. In the third paper, we observe how socio-economic factors are capable of explaining constitutional change. In a nutshell, in this work I try to bridge institutional qualities of subnational units with aspects of fiscal federalism, socio-economic structure, and tax effectiveness.

When trying to explain the secular decline in Argentinian economic wealth throughout a century, Vito Tanzi argued that its problems were "mostly fiscal" (Tanzi, 2007). Argentinian fiscal structure concentrates expenditures at the provincial level, while a bad mixture of provincial taxes and centralised revenues at the federal level lead to a high degree of vertical fiscal imbalance (VFI). These features have attracted scholars, and their research has motivated this thesis[2]. On the one hand, the very existence of VFI implies that subnational governments finance a big portion of their budgets with federal transfers.

[2]Institutional implications of fiscal arrangements for Argentina are better summarised by Ardanaz et al. (2014).

The literature on unearned revenues and the accountability effects is vast (for two comprehensive surveys see Ploeg (2011); Ross (2015)). Embedded in this scholarship is the concept of "Rentier State" where *"...an abundant flow of oil revenues enables incumbents to both reduce taxes and increase patronage and public goods, making it possible for them to buy off a larger set of potential challengers and reduce dissent"*(Mahdavy, 1970; Ross, 2001, 2015). The failures of subnational units to build cohesive institutions can be rooted in such effects. Drawing on these concepts, Gervasoni (2010), one of the earliest influences on this work, adapts this definition to "Rentier Provinces": subnational units in command of fiscal rents. These provinces, the author argues, have seen a detrimental reduction in provincial democratic levels. The particularities of Argentinian fiscal system, on the other hand, can be connected to the literature that explores the effects of decentralisation. The positive effects of decentralisation (as in Oates (2008)) can be seriously undermined by pervasive characteristics at the subnational level. Particularly relevant is the likelihood of elite capture, the idea that certain vested interest-groups can redirect and appropriate local institutions to benefit them in corrupt manners (for comprehensive surveys on the effects of decentralisation see Mookherjee (2015); Mansuri and Rao (2012)). These enormous strands of literature touch diverse aspects of the three chapters in this thesis.

The three papers in this thesis follow a similar methodology. They are primarily empirical studies but coupled with theoretical models that guide the intuition and connect empirical elements. In terms of the theory, in the first two chapters I use widely popular political economy models. These models are motivated in the books by Persson and Tabellini (2000, 2005); Besley (2005); Besley and Persson (2011*b*). In the first one, in a political agency theoretical setting, the incumbent can actively pursue affecting the probability of re-election by diverting funds from the provincial budget. A game where incumbents can buy political support by investing in legislators is considered. This decision depends on a number of institutional features, but higher rents from office alter the advantages of this "Political Confrontation". In the second paper, a career concern type of model is adapted to exploit the possibility of tax instruments with different levels of visibility. The local mayor in this setting has three sources of revenues with different level of visibility, two taxes and federal transfers. The non-salient part of the municipal budget creates an underestimation of the true local revenues, which makes voters overestimate the mayor's ability. An exogenous increase in federal transfers not only accentuates this, but also relaxes budget pressures, permitting some tax substitution. We show that the fully observable tax is the most likely tax base to be replaced in such a scenario. Lastly, without a model but guided by a theoretical framework, in the third paper, municipal charters are thought to be the outcome of a number of socio-economic characteristics, in particular local segregation. In this chapter, endogenous institutional change literature, the role of elite capture in decentralised countries, the "Constitutional Contract Theory" (charters seen as aggregations of citizen preferences), and a number of other possible explanations are discussed.

In terms of the empirical strategy, the first two chapters use quasi-experimental designs from natural experiments. In the first chapter, I combine the exogenous term limit faced by incumbents after 1983, with a proposed instrument for federal transfers that exploits

military alterations. Following a similar structure to Galiani et al. (2016), the instrument is obtained from aggravations, by military decree[3], of an already non-proportional provincial distribution of seats in Congress (our variable "Aggravated Malapportionment"). In the second one, I use event case difference-in-differences generated by the combination of both, the creation of a Federal Solidarity Fund in 2009 (FFS by its Spanish acronym) and the form it was distributed to provinces using arbitrary coefficients from the FTSA of 1988. This generated a differential influx of funds in municipalities only because of the different provincial location. In the third chapter, I rely on the plausibly exogenous decision from provinces to permit municipalities to dictate Municipal Charters, and the population thresholds institutionally set, to analyse the time to reform as survival analysis.

One important contribution of this work has been the compilation of three brand new datasets. For the first chapter, a provincial dataset was assembled containing fiscal, economic and political variables over the period 1983-2014. This database builds on the work by several authors which have gone remarkable distances to amass provincial information[4]. For the second chapter, a newly data panel of 428 local governments in Argentina was collected over 2006-2017. The key contribution of this dataset was the disaggregation of subcomponents of municipal revenues. Multiple sources of municipal data were scrutinised, mostly from municipal authorities[5], but secondary sources, such as provincial organisms, were also crucial[6]. A thorough search was performed for the entire set of municipalities bigger than 10.000 habitants, in some crucial cases, emails, phone calls and even letters by post were used. Finally, in the third chapter we compiled a panel dataset for municipal segregation indexes and other socio-economic characteristics. These local measures were obtained from census tracts in Census 2001 and 2010[7].

As previously mentioned, the first two chapters deal with unintended consequences of federal transfers. In the first paper, titled *"Rentier Governors: A Fiscal Theory of Constitutional Reforms"*, I argue that those jurisdictions with higher shares of FTSA per capita were among the first to reform constitutions to relax term limits. Using a formal model and the natural experiment for term limited governors, I suggest term limits may be endogenous to federal transfers. The second chapter, *"Resource Windfalls and Tax Instruments. Evidence from Local Governments in Argentina"*, examines the effect of the exogenous implementation of the Federal Solidarity Fund in 2009 on the tax structure of municipalities in Argentina. Using a formal model, we exploit the design of FFS distribu-

[3] In 1983, before calling elections, the minimum number of Deputies per province was increased to five.

[4] Just to mention a few, Russo (1997), Porto (2004), Calvo and Escolar (2005) and Tow (2016), and the work by the School of Economics - Buenos Aires University (FCE-UBA) - Public Administration Research Centre (*Centro de Investigaciones en Administración Pública (CIAP)*). Constitutional reforms and provincial laws information was more disperse. This portion of the data draws mainly on Almaraz (2010), Lucardi and Almaraz (2017), Calvo and Escolar (2005), Altavilla (2017), and Liendo (2014)

[5] Official web pages either from municipalities, from local legislative councils, or from the municipal audit office (if there was any). "The Wayback Machine"(`http://http://web.archive.org/.`), a digital library with billions of stored web pages, allowed us to recover data from deleted or unused old websites.

[6] Provincial audit offices (*Tribunal de Cuentas Provincial*) that collect municipal budget information in the provinces of Entre Rios, or Mendoza, or Provincial Statistics Directions such as in Neuquen. Or the Provincial Council for Fiscal Responsibility in Chubut.

[7] These three dataset are available upon request.

tion to apply event case difference-in-differences. We build a case showing that those local mayors who received a disproportional influx of FFS funds reduced direct visible property taxes, with no effect on total municipal revenues. Lastly, departing from the topic of federal transfers, the third chapter - *"Spatial Inequalities Shaping Institutional Design. Municipal Charters in Argentina"*- explores constitutional change at the local level, and the findings seem to point that the probability of sanctioning Municipal Charters (MC) is linked to local socio-economic segregation levels.

Finally, the workings of ineffective states are a flourishing area for research. Although focused only Argentina, I acknowledge that the topics presented in this thesis are widespread, especially in Latin America. Every so often, incumbents try to exploit unaccounted funds, resource windfalls, or commodities booms to further their political careers. Some of them build stadiums, others just buy-off opposition and write tailored constitutions. The consequences are usually grim.

Chapter 1

Rentier Governors: A Fiscal Theory of Constitutional Reforms

Abstract

Can disproportional fiscal rents perpetuate local politicians? In this paper, I explore a subtle channel by which arbitrary fiscal arrangements can facilitate constitutional reforms in term-limited Argentinian provinces. I use a political agency model to analyse the decision of an incumbent to buy off legislators and to engage in "political confrontation" with the purpose of affecting the probability of re-election. Institutional features shape governor's incentives, but higher exogenous rents alter the advantages to political gambling. To put this theory to test, I compile a new dataset on economic and institutional variables over 1984-2014. In the fragile return of Argentina to democracy in 1983, all elected governors faced term-limited offices. I combine this generalised re-election ban with a proposed instrument for federal transfers that exploits aggravations of an already malapportioned Federal Congress made by the departing military government. The empirical evidence indicates that higher levels of federal transfers per capita increase the probability of relaxing term limits.

1.1 Introduction

Careless design of fiscal federal arrangements can have far-reaching institutional repercussions. This paper studies the effect of fiscal resource abundance, generated by disproportionate federal transfers, on the likelihood of relaxing term limits in Argentinian provinces. During the convulsed early 1980's, the idea of constitutional reform as a process for legitimisation of young democracies was widespread across Latin America (Nino, 1993; Stotzky, 1989). In Argentina, after more than 50 years of democratic and political turmoil, elected incumbents in 1983 saw themselves with a particular impediment: re-election was banned. If they were to "survive" in power, they needed to amend provincial constitutions. Did federal transfers affect the probability of constitutional reforms in term-limited Argentinian provinces?

A large body of literature focuses on the intricacies of the so-called resource curse. This research discusses the effects of "unearned" or "free resources" on institutional features (for two comprehensive surveys see Ploeg (2011); Ross (2015)). One strand of this scholarship explores the concept of "Rentier State". First postulated by Mahdavy (1970), and further developed by Ross (2001), it describes cases where *"...an abundant flow of oil revenues enables incumbents to both reduce taxes and increase patronage and public goods, making it possible for them to buy off a larger set of potential challengers and reduce dissent"*(Ross, 2015). From a subnational perspective, for an incumbent who receives fiscal grants from a tax-sharing agreement, the internalisation of that revenue resembles foreign aid; an uncollected resource for which is not necessarily accountable. Behind this well documented phenomenon lies the possibility of shifting fiscal responsibilities.

This paper argues that constitutional features can be rooted in the fiscal federal (dis) organisation of a country. Argentina presents us with an opportunity to study this for term limits. For institutional reasons, in 1983, Argentinian governors were banned from running for re-election. This exogenous term limit faced by the ruling elite and the combined effect of military alterations, to both the Federal Tax-sharing Agreement (FTSA) and to the power in Federal Congress, offered a suitable empirical ground for work. By exploiting these particularities, I assess the impact of automatic transfers from the federal government on one crucial institutional pillar; provincial constitutions. I proceed in two steps. First, I build a theoretical model that helps us better understand the effects of exogenous rents on the probability of re-election. Second, in the empirical section, I study term limits in Argentinian provinces, and I provide some evidence linking FTSA per capita with the likelihood of relaxation of term limits. Lastly, to further explore causal mechanisms, in the last section of the paper, I instrument federal transfers using the aggravation of malapportionment in the National Congress after 1983 military modifications.

The contribution of this paper is twofold. First, based on Besley and Persson (2011*a*,*b*), a political agency model is developed to make the turnover probability endogenous. This is characterised by the decision of an incumbent to buy off legislators with the purpose of affecting the likelihood of re-election. The incumbent can actively pursue this by diverting funds from the provincial budget. I add to this model in two ways. On the one hand, I depart from the idea that turnover is related to political violence or armed con-

flict. The concept of "political confrontation" is proposed, where the incumbent can alter institutional settings by diverting funds and by exploiting legal channels. On the other hand, in order to parallel the situation in Argentina in 1983, I modify the model so that the incumbent in the first period cannot run for re-election unless she invests in political confrontation. By doing this, I obtain clear-cut theoretical propositions to test with the data.

The second contribution is empirical. An original panel dataset is built on fiscal, political and economic variables over 1983-2014. In that period, 28 episodes of term-limit modifications were identified, involving 20 out of the 24 provinces. I begin the analysis by showing suggestive findings using survival analysis tools. In this framework, relaxing term limits is seen as "failure" event, and provinces (or governors) start failing at different points in time after 1983. While duration analysis uses a combination of cross-sectional variation with the specific timing of reforms, I also take advantage of the panel structure of the data. Thus, the Linear Probability Model (LPM) allows us to account for provincial heterogeneity and time-invariant institutional factors. What stands out from these specifications is the systematic and significant correlation between FTSA per capita and the probability of reforming provincial Constitutions. I conclude this empirical section by proposing an instrument for federal transfers; "Aggravated Malapportionment" inspired by Galiani et al. (2016). This instrument helps us to build the case for causal effects running from fiscally "Rentier Provinces" (Gervasoni, 2010, 2018) to local constitutional modifications.

This paper relates to a strand of literature that links windfall-like fiscal transfers to diverse outcomes, such as public spending, living standards, corruption and incumbency advantage (Brollo et al., 2013; Litschig and Morrison, 2013; Ferraz and Monteiro, 2014; Caselli and Michaels, 2013; Gadenne, 2017). Empirically, most of these studies use regression discontinuity design (RDD) to tackle potential endogeneity of transfers. The design of Brazil's fiscal system seems to be particularly well suited for this: tax-revenue is mainly redistributed to subnational governments on the basis of population, and the formula includes specific cut-offs. I extend this body of research to the Argentinian setting. I deal with endogenous federal transfers by using an exogenous instrument generated by military alterations to the number of legislators in the Federal Congress. By over representing less populous provinces, the military government exacerbated an already malapportioned Congress before calling elections in 1983.

Argentinian fiscal federalism has been carefully scrutinised in the literature, in particular for its high degree of vertical fiscal imbalance (Porto and Sanguinetti (2001), Moskovits and Cao (2012), Artana et al. (2012), Tommasi et al. (2001)). Previous studies show the implications of fiscal arrangements in the institutional setting (for a survey see Ardanaz et al. (2014)). These effects include, among others, malapportionment (Galiani et al., 2008), incumbency advantage or power concentration (Calvo and Escolar, 2005), and reduction of accountability (Gervasoni, 2010). The contribution of this paper is proposing an alternative consequence of inadequate fiscal arrangements, the facilitation of constitutional reforms.

Several studies use term limits or the number of re-elections as determinants of the democratic structures (for applications in Argentina see Gervasoni (2009) and Ardanaz et al. (2014)). The logic behind this research is sound; longer time-spans in power may help the incumbent to increase her grip on institutions. However, given that in Argentina in 1983 no province allowed for re-elections, term limits may be endogenous. Indeed, I provide evidence that federal transfers affected the likelihood of reform. According to the evidence presented, it is not possible to understand the perpetuation in power of certain governors, or the characteristic strong executive branch, without connecting this to the fiscal imbalance politically exploited by those incumbents. The same resources that facilitated term limits reforms (in some cases permitting indefinite re-elections) may have been used in subtle ways to undermine democratic institutions in the most vulnerable jurisdictions.

Two works are closely related to the questions posed in this paper; Lucardi and Almaraz (2017) and Gervasoni (2010, 2018). Lucardi and Almaraz (2017) explain term limit relaxation in Argentinian provinces by focusing on political control of the jurisdiction, and the degree of opposition dispersion. The argument is compelling, but the mechanism at work in this paper is different for three reasons. First, our period of analysis focuses only on initial reforms that affected term limits. While some jurisdictions reformed more than once, initial reforms are seen as game changers that altered the local constitutional landscape. Secondly, although it is acknowledged the political local game and its importance in facilitating (or blocking) reforms, there is a case for a different channel allowing term limit relaxation, the office-value originated from fiscal advantages. Third, and last, I contribute to the empirical approach by using an instrument to better explore causal mechanisms behind relaxing term limits. The research in Gervasoni (2010, 2018) provides empirical support to the claim that provinces in command of fiscal rents (mainly in the form of federal transfers) have seen a reduction in democratic levels of accountability in Argentina. According to the author, these rentier provinces are characterised by restrained political competition (executive and legislative contestation) and high-power concentration on the incumbent, in the form of multiple re-elections and provincial legislature control. Term limits are used as determinants of levels of democracy, but in this paper it is argued that term limits are endogenously determined by federal transfers.

Finally, as previously discussed, I exploit some characteristics of the democratic transition of the country in 1983. There is some research that closely looks at these democratic alternations, or junctures, to explore the behaviour of elite groups. Examples of this line of research are, among others, Acemoglu and Robinson (2008) and Martinez-Bravo et al. (2017). This literature highlights the different mechanisms and effects caused by the distribution of political power when facing institutional change. While I do not look at specific behaviour of vested-interest groups or political dynasties, the behaviour of term-limited governors (provinces) and the appetite for constitutional tailoring is analysed.

The remainder of the paper is organised as follows. Section 1.2 provides a theoretical model to shed light on the relationship of "unearned" revenues and term limits. Section 1.3 studies at length the empirical approach. This long part of the paper is subdivided

in several subsections that explore the institutional background (1.3.1), the reforms of provincial constitutions (1.3.2), the initial empirical findings using Cox model and LPM (1.3.3), and the proposed instrument for federal transfers (1.3.4). Finally, I conclude by connecting the theoretical propositions to the empirical evidence.

1.2 Theoretical Model

In this section, we proceed to model the behaviour of an incumbent on the decision to use political influence to relax term limits. Drawing from Besley and Persson (2011*b*,*a*), I begin by adapting the model to depart from turnover being determined by political violence. A different channel is proposed, best described as "Political Confrontation". In this scenario, the incumbent manipulates institutional settings by spending on legislators. The second modification involves the fact that the incumbent necessarily has the initiative, otherwise she is banned from running as candidate. This pretends to simulate conditions in Argentina in 1983, where re-election was not allowed. In this two-time period model, it implies starting with a probability of turnover of one. The theoretical framework also involves two groups (incumbent I and opposition O). The group in power in the first period faces the decision to spend in public goods, in transfers to both groups, or in buying off support in the Legislature (L^I) with the aim of affecting the likelihood of turnover. The interplay between the advantages of remaining in power and the costs of political conflict will trigger confrontation. Crucially, how cohesive institutions are will set a limit to intra-group transfers, and hence determine the office premium of being (and remaining) incumbent.

Two equilibrium spaces are identified. First, in what we call "Restrained Incumbent", institutional constraints are tight, and public goods are highly valued. Most spending goes to public goods and therefore there is no real motivation to keep office. There is rotation in power. Second, we can potentially end up in the "Political Confrontation" scenario, where some spending goes to transfers, and there are advantages on holding office. Given these conditions, it is reasonable for the governor to spend on legislators trying to affect the probability of turnover. However, the office premium will be compared to the cost of confrontation. There will not be term limit relaxation if the advantages of remaining are small relative to the costs of political confrontation. Term limit relaxation equilibrium will occur just in the opposite scenario; high office premium. If that is the case, the incumbent in period 1 will divert part of the budget to buy off Legislators and affect term limits. In the following pages, we discuss this model in detail and derive our formal propositions.

1.2.1 A Reformer Model

There are two time periods $s = 1, 2$ with two identical groups ($J = A, B$) of individuals which comprises half of the population each, and total population size is normalised to 1. At the beginning of period $s = 1$ one group holds power $I_1 \in A, B$, which we call the incumbent, and the other group is the opposition $O_1 \in A, B$. Since there are only two periods, the incumbent can either be re-elected or not. Each group has a quasi-linear utility function:

$$u_s^J = x_s^J + \alpha\, V(g_s) \tag{1.1}$$

Where x_s^J represents private consumption, and $V(.)$ is the utility deriving from public good consumption. It satisfies *Inada-type* conditions: increasing, concave, continuously

differentiable, $V_g(0) \to \infty$ as $g_s \to 0$, and $V_g(\infty) \to 0$ as $g_s \to \infty$[1]. The parameter α is a shifter of the value of public goods, a constant parameter with $2 > \alpha > 1$. Importantly for our results, this ensures clear ordering for preferences in corner solutions. For each member of the group $J = I, O$, private consumption is given by net of taxes income y and transfers r_s^J,

$$x_s^J = (1-\tau)y + r_s^J, \quad J \in I, O \tag{1.2}$$

Political institutions are modelled by adding a constraint to the incumbent. If r_s^I is the transfer to the incumbent group, σr_s^I should be given to the other group.

$$r_s^O \geq \sigma r_s^I \tag{1.3}$$

We assume that this fixed share $\sigma \in [0, 1]$ is exogenously given. We think of it as Executive Constraints faced by the incumbent, when $\sigma = 1$, transfers between groups are the same. The Government has a budget constraint from where there is spending in public good, in transfers to groups, or in political influence in the (single chamber) Legislature $(g_s; \{x_s^J\}; m_s)$. m_s represents the extra cost of legislators, at salary w, in period one.

$$m_s = \begin{cases} \omega L^I, & \text{if } s = 1 \\ 0, & \text{if } s = 2 \end{cases}$$

Therefore, the budget constraint of the government is as follows:

$$R + \tau y = g_s + \frac{r^I + r^O}{2} + m_s \tag{1.4}$$

Public revenues come from two sources: non-tax revenues R and taxes τ. R is an exogenous source of income, for instance, windfall-like federal transfers. τ captures provincial taxes on income y. We can express (1.4) in terms of the transfers:

$$r^J = \beta^J [R + \tau y - g_s - m_s] \tag{1.5}$$

If we define the parameter $\theta = \frac{\sigma}{1+\sigma} \in [0, \frac{1}{2}]$[2], we can obtain $\beta^I = 2(1-\theta)$ and $\beta^O = 2\theta$. As we can see, if $\theta = \frac{1}{2}$, $\beta^I = \beta^O$. On the other hand, if $\theta = 0$ the incumbent can transfer all to his own group. In other words, θ represents the *restrictions* on institutions in the model, or the Executive Constraints.

Turnover Probability: The probability of turnover, γ is affected by spending in "political control", understood as the number of legislators needed to surpass a majority institutional threshold for constitutional reforms in the Legislature house (L^I). Rather than distinguishing between opposition and incumbent legislators, by generally specifying (L^I) we assume no party loyalty, a realistic assumption for divided and atomized opposition in provincial parliaments in Argentina (see Lucardi and Almaraz (2017)). The

[1] We are using the notation setting the first derivative as $\frac{\partial V}{\partial g} = V_g(.)$

[2] From the equation $R + \tau y = g_s + m_s + \frac{r^I + r^O}{2}$, we replace $r^O = \sigma r^I$, we solve for r^J using that $(1-\theta) = \frac{1}{1+\sigma}$ and we get (1.5).

incumbent can spend from the public purse in paying salary w to the extra legislators (wL^I). The probability of turnover is:

$$\gamma(L^I) \tag{1.6}$$

We make the following assumption on the gamma function:

Assumption 1: *For all* $L^I \in [0, \hat{L}]$, *we assume,* $\gamma \in [0,1]$ *and* $\gamma_L < 0$, $\gamma_{LL} > 0$,

This assumption reflects the power of the incumbent to affect γ albeit at a decreasing rate. $\hat{L}$ is an institutional minimum from which there is no point in exceeding that number of legislators. For instance, the qualified majority voting thresholds for constitutional reforms[3]. There exist $L^I \in [0, \hat{L}]$ such that:

$$\gamma(L^I) = \begin{cases} 1 & \text{if} \quad L^I = 0 \\ 0 \leq \gamma(L^I) < 1, & \text{if} \quad L^I \in (0, \hat{L}] \end{cases} \tag{1.7}$$

We start off with $\gamma(0) = 1$, which can be interpreted as re-election banned on the first period.

Timing The timing of the model is as follows:

- Incumbent (I_1) is in power and nature determines parameters $\{\theta, \alpha, y, R, \tau\}$,
- I_1 chooses a set of first-period polices $\{g_1, r_1^J, L^I\}$,
- $(1 - \gamma(L^I))$ is determined,
- The new incumbent I_2 chooses new policies $\{g_2, r_2^J\}$.

We have to solve for a Subgame Perfect Equilibrium. The quasi-linearity of the utility function allows us to recursively solve the problem. At each time, the group in power decides spending among public good, transfers and political conflict $\{g_s, r_s^I, L^I\}$. Thus, we start by looking at the decisions of the group in power in period two, and then go back to period one.

Substituting the above-mentioned constraints into the utility function (1.1), we get period two maximization problem. Since there is no spending on L^I, the incumbent chooses the set of policies $\{g_2, r_2^I\}$ such that:

$$\max_{g_2, r_2^I} \quad \alpha V(g_2(\alpha, \theta)) + (1 - \tau)y + 2(1 - \theta)[R + \tau y - g_2(\alpha, \theta)] \tag{1.8}$$

[3]Mathematically, we are thinking in terms of a function along the lines of $\gamma(L^I) = 2e^{-L^I} - 1$, for $\hat{L} = \ln 2$.

Period 2 - Public Good and Transfers Spending: From the FOC for g_2 we get the following solution:

$$\alpha V_g(g_2) \geq 2(1-\theta) \tag{1.9}$$

This reveals the trade-off for the incumbent between public good consumption, valued at $\alpha V_g(g_2)$, and the utility from transfers $2(1-\theta)$. Thus, public good spending will be given by:

$$g(\alpha,\theta) = \begin{cases} R+\tau y, & \text{if } \alpha V_g(R+\tau y) > 2(1-\theta) \\ 0, & \text{if } \alpha V_g(0) < 2(1-\theta) \\ \hat{g}(\alpha,\theta) & \text{otherwise} \end{cases} \tag{1.10}$$

By the property that $V_g(0) \to \infty$ as $g_s \to 0$, there is always some level of public good spending. Consequently, transfers in period two will be given by

$$r_2^J = \beta^J[R+\tau y - \hat{g}(\alpha,\theta)] \tag{1.11}$$

When the budget is entirely spent on public goods, $r_2^J = 0$, there is no advantage in holding office. Both groups get the same utility from public good consumption. We will use this for Proposition 1.

Period 1 - Political Conflict Decisions: In period 1, the incumbent additionally faces the decision on L^I spending. This will in turn increase the probability of being an incumbent in period 2. The group in power chooses the vector of policies $\{g_1, r_1^J, L^I\}$ in order to maximise:

$$\begin{aligned} \max_{g_1, r_1^J, L^I} \quad & \alpha V(g_1(\alpha,\theta)) + (1-\tau)y + \beta^J[R+\tau y - g_1(\alpha,\theta) - wL^I] \\ & + (1-\gamma(L^I))\; u_2^I(\alpha,\theta) + \gamma(L^I)\; u_2^O(\alpha,\theta) \end{aligned} \tag{1.12}$$

As we can see, (1.12) involves two periods, with the subsequent probability of being incumbent or opposition in the second period. Depending on institutional factors (α,θ), these two future states will bring different utility to the current incumbent, factorised by the probability of each state. From the FOC for (1.12) for the selection of L^I we get:

$$-\gamma_I(L_1)\;[u_2^I(\alpha,\theta) - u_2^O(\alpha,\theta)] - \lambda_1 w \leq 0 \tag{1.13}$$

The opportunity cost of foregone spending λ_1 is related to the incumbent's decision to spend on transfers and public good provision. With an interior solution, the marginal cost of public funds will be the same. More generally:

$$\lambda_1 = \max\{\alpha V_g(g_s); 2(1-\theta)\} \tag{1.14}$$

It is insightful to compare the indirect utilities for the two limit realisations of $\theta \in [0, \frac{1}{2}]$. If $\theta = 0$, there are no restrictions in place for transfers. Therefore, the expected utility difference will be $(u_2^I(\alpha,0) - u_2^O(\alpha,0) = 2[R+\tau y - \hat{g}])$[4]. On the other hand, if $\theta = \frac{1}{2}$ there

[4] $$u_2^I(\alpha,0) = \alpha V(\hat{g}) + 2[R+\tau y - \hat{g}] + y(1-\tau) \quad \text{and} \quad u_2^O(0) = \alpha V(\hat{g}) + y(1-\tau)$$

is no difference between expected utilities, i.e., $(u_2^I(\alpha, \frac{1}{2}) - u_2^O(\alpha, \frac{1}{2}) = 0)$[5]. In general, we have:

$$[u_2^I(\alpha, \theta) - u_2^O(\alpha, \theta)] = \omega 2(1 - 2\theta)Z \tag{1.15}$$

Where

$$Z = \frac{[R + \tau y - \hat{g}(\alpha, \theta)]}{\omega} \tag{1.16}$$

Plugging (1.15) into (1.13), we can get the following expression:

$$-\gamma_L(L^I)\,\omega 2(1 - 2\theta)\,Z^I - \lambda_1 \omega = 0 \tag{1.17}$$

Where we can see that the decision to invest in political influence in period 1 is related to the expected value of the wage-adjusted redistributive funds (Z) compared to the cost of L^I, adjusted for the opportunity cost of funds ($-\lambda_1 w$). However, from (1.17), spending in (L^I) is connected to the parameters of the $\gamma(L^I)$ function. Z^I can be defined as:

$$Z^I = \frac{-\lambda_1}{\gamma_L(L^I)2(1 - 2\theta)} \tag{1.18}$$

Considering that the decision to invest in L^I is related to the size of the redistributive "pie" in the next period (Z), we can get the following propositions:

Proposition 1: *When public goods are highly valued, $\alpha V_g(R + \tau y) > 2(1 - \theta)$, the incumbent makes no transfers. There is no advantage in holding office and there is no investment in political conflict $L^I \to 0$.*

Proof Proposition 1: When $\alpha V_g(R + \tau y) > 2(1 - \theta)$, we have a corner solution and the budget is entirely spent on public good provision. Assume otherwise, and some level of transfers are paid. The utility derived from these transfers will be given by $2(1 - \theta)$. But, given condition (1.9), the incumbent will redirect spending from public good to transfers if and only if $\alpha V_g(R + \tau y) \leq 2(1 - \theta)$, which is a contradiction. Furthermore, given the assumptions imposed on $V(g_s)$, transfers are only provided when there is an interior solution.

Since we have $\hat{g}(\alpha, \theta) = R + \tau y$, by equation (1.16) and (1.15), we get $Z = 0$ and $u_2^I(\alpha, \theta) - u_2^O(\alpha, \theta) = 0$. In other words, there is no advantage in holding office. The current costs of spending on Legislators is never covered by future benefits from transfer differential in second period. Formally, since $Z = 0$ equation

$$-\gamma_L(L^I)\,w 2(1 - 2\theta)\,Z - \lambda_1 w = 0$$

is not affected by spending in L^I. Therefore $L^I = 0$ and γ remains 1; $\gamma(0) = 1$.

Proposition 2: *For an interior solution, with $\theta < \frac{1}{2}$, and given some level of spending on transfers, there is one threshold such that:*

---

[5] $u_2^I(\alpha, \frac{1}{2}) = \alpha V(\hat{g}) + [R + \tau y - \hat{g}] + y(1 - \tau)$ and $u_2^O(\frac{1}{2}) = \alpha V(\hat{g}) + [R + \tau y - \hat{g}] + y(1 - \tau)$

1. *If $Z \leq \bar{Z}$, there is no investment in L^I ($L^I = 0$), and $\gamma = 1$,*

2. *If $Z > \bar{Z}$, the incumbent invests in L^I ($L^I > 0$), and $0 \leq \gamma(L^I) < 1$.*

Proof Proposition 2: The proof of proposition 2 can be divided in two. First of all, we show that L^I is increasing in Z, for $Z > 0$. From (1.17), we get

$$Z = \frac{-\lambda_1}{\gamma_L(L^I)2(1-2\theta)} \tag{1.19}$$

If we differentiate (1.19), and using FOC for L^I spending, we can get:

$$\frac{dL^I}{dZ} = \frac{-\gamma_L}{Z\,\gamma_{LL}} > 0 \quad \text{if} \quad Z > 0 \tag{1.20}$$

This is the result of our Assumption 1. The expenditure on legislators is increasing on the wage-adjusted funds being transferred Z. Subsequently, we have to prove existence of a triggering point Z^I for political spending. Given that L^I is increasing in Z, we can define $L^I(Z)$ such as:

$$L^I(Z) = \begin{cases} 0, & \text{if} \quad -\gamma_I(0)\,2(1-2\theta)\,Z - \lambda_1 \leq 0 \\ \hat{L}^I(Z), & \text{if} \quad -\gamma_I(\hat{L}^I(Z))\,2(1-2\theta)\,Z - \lambda_1 > 0 \end{cases} \tag{1.21}$$

Therefore, the triggering point is:

$$Z(\alpha,\theta) = \frac{-\lambda_1}{\gamma_L(0)2(1-2\theta)} > 0 \tag{1.22}$$

Since $\gamma_L(0) < 0$, it concludes the proof of the proposition.

In a scenario where the model leads to transfers, two different results can be observed. On the one hand, it can be the case that buying off legislators is so expensive (high w) compared to the future proceedings from office (Z), that there is no conflict. $\gamma(0)$ remains 1, and there is alternation in power. Alternatively, when returns of holding office are sufficient, they can cover the present cost of Legislators in period one. In these circumstances, the incumbent invests in L^I to set $0 \leq \gamma(L^I) < 1$ and relax term limits. In Table 1.1 we can observe this more clearly, and $\hat{g}$ represents an interior solution:

(A) Restrained incumbent ($\alpha V_g(R+\tau y) \geq 2(1-\theta)$). Since everything is spent on public goods, $\hat{g}(\alpha,\theta) = R + \tau y$, $Z = 0$ and there is no difference in future utilities for both groups. As there is no spending on transfers, there is rotation in power and $\gamma(0) = 1$. As we can see, this scenario is more likely to happen as $\theta \to \frac{1}{2}$.

(B) Political confrontation ($\hat{g}(\alpha,\theta)$): The model leads to transfers and there are advantages in staying in power; i.e., $[u_2^I(\alpha,\theta) - u_2^O(\alpha,\theta)] = w2(1-2\theta)Z$. The final result depends on how large Z is. We have two possible outcomes.

[a] No term limit relaxation ($Z \leq \bar{Z}$): The advantages of remaining in office are small relative to the costs of political confrontation. In other words, they do not

Table 1.1: Political Investments

Key Parameters	$Z \leq \bar{Z}$	$Z > \bar{Z}$
$\theta < \frac{1}{2}$	$\gamma(0) = 1$	$0 \leq \gamma(L^I) < 1$

compensate the cost of buying off legislators in the first period. Therefore, there is no expenditure in L^I, and $\gamma(0) = 1$,

[b] Term limit relaxation ($Z > \bar{Z}$): The incumbent in period 1 decides to divert part of the budget to buy off Legislators, in this scenario, $0 \leq \gamma(L^I) < 1$.

Corollary 1: *Given some levels of transfers, higher wages ω decrease the likelihood of a constitutional reform affecting term limits.*

When there are transfers in the model, the group in power compare the cost of buying off extra legislators with the future benefits of holding office. w constitutes a direct measure of the marginal cost the incumbent faces. The higher is the cost, measured in w, the smaller will be this "pie" in the second period.

Corollary 2: *With positive transfers, higher values for R increase the likelihood of an incumbent pushing for a constitutional reform affecting γ, the probability of turnover.*

The main effect of R runs through the increase of the "redistributive pie" from which the incumbent will make transfers.

For the proofs of Corollaries, we work with (1.16):

$$Z = \frac{[R + \tau y - \hat{g}(\alpha, \theta)]}{w}$$

Proof of Corollary 1: We need to prove that Z is decreasing in w:

$$\frac{dZ}{dw} = -\frac{[R + \tau y - \hat{g}(\alpha, \theta)]}{w^2} < 0 \tag{1.23}$$

Proof of Corollary 2: Similarly, we show that Z is increasing in R. From (1.16) we get:

$$\frac{dZ}{dR} = \frac{1}{w} > 0 \tag{1.24}$$

In the following sections we are going to contrast theoretical results with modifications of term limits in Argentinian provinces after 1983.

1.3 Empirical Analysis of Constitutional Reforms

The remainder of the paper is devoted to the study of the impact of automatic transfers from the Federal Government on the probability of reforming constitutions with re-election aims. The theoretical propositions in the previous section are put to the test through the lens of fiscal and institutional data in Argentina. The analysis is divided into four. We start with a short description of the Argentinian fiscal system; we show that transfers from the Federal Tax-sharing Agreement (FTSA) are crucial for subnational provincial budgets. Then we move on to study constitutional reforms. While in 1984 re-election was banned in all provinces, slowly but surely most jurisdictions relaxed term limits in the last 30 years. We continue by showing some initial findings. We explore discrete-time survival analysis using a combination of cross-sectional variation with timing of reforms, and then exploiting the panel structure of the dataset. Lastly, we propose an instrument for federal transfers, "Aggravated Malapportionment" inspired by Galiani et al. (2016), to argue for causal effects.

1.3.1 Argentinian Fiscal System

This section presents a brief summary of Argentinian' fiscal, economic, and political structure. The main purpose is to scratch the surface of a complex federal system and to set the framework for the analysis of provincial reforms (for a detailed study see Porto and Di Gresia (2012) or Porto (2009)). Argentina is a federal country formed by three different levels of government: Federal, Provincial and Municipal. Provinces pre-existed the Nation[6] and consequently enjoy ample constitutional power when it comes to spending and tax collection.

The historical process of how fiscal responsibilities evolved in time is best summarised by Porto (2009). The author distinguishes three periods of federalism in Argentina: "Competitive Federalism", "Cooperative Federalism" and "Coercive Federalism". The "Coercive Federalism" period started by early 1970's, and it was (and still is) characterised by strong intervention by the Federal Government in fiscal affairs, and a structure of transfers with no parliamentary discussion and halfway corrections. The current picture is that of a complex system with a pronounced vertical fiscal imbalance due to centralisation of revenues and decentralisation of expenditures[7]. This clashing structure of revenues and expenditures pushes provinces to a constant deficit (Porto and Di Gresia, 2012; Ardanaz et al., 2014), which is partially covered by transfers from the tax-sharing regime (FTSA - *Coparticipation*).

[6] At the moment of the first Constitution 1853, there were 14 provinces, which then evolved to 23 plus the City of Buenos Aires (capital of the country). In this work they will be considered as 24 jurisdictions.

[7] The National Constitution regulates the distribution of taxing capabilities, where the Federal Government retains the power to levy imports and exports duties (trade taxes), and there is concurrent power with the provinces when it comes to indirect taxation. In its Article Nro. 75, the Constitution establishes that provinces can use direct taxation. In practice, provincial governments have delegated this responsibility in the Federal Government. Following an opposite path, provinces face a wide range of responsibilities; they supply "visible" local public goods such as education, health, housing, and infrastructure, among others.

The backbone of Argentinian' fiscal structure is the Federal Tax-sharing Agreement (FTSA) system. The grant structure allocates funds from a pool of taxes to provinces[8]. Provincial shares, *participations*, are far from objective: they are a mixture of a Law from 1988 and subsequent "Fiscal Pacts". Modifications to the system are almost deadlocked; they require not only the approval of the Congress (both Chambers), but also from the President and from each Governor. This zero-benefit game has proved difficult to overcome. By constitutional mandate in 1994, a new Law establishing the new structure of provincial shares should have been passed before 1996. Nowadays, more than 20 years after that deadline, this Law has not been sanctioned.

It has not always been like this. One of the milestones of the Federal Tax Share Agreement in Argentina was the sanction of Law 20,221 in 1973 (Saiegh and Tommasi, 1998; Porto, 2004). For the first time in the fiscal history of the country, the allocation criteria for the common pool of taxes, the so-called secondary distribution[9], was determined by objective indicators. Each province would receive a share of total funds determined by a combination three factors: development gap[10] (25%), demographic dispersion (10%), and population (65%). Even though sanctioned by a military government, the "Law-Accord for the Coparticipation of Federal Taxes" was ratified and prolonged until 1983 by the National Congress, democratic at that moment. This reflects the fact that negotiations with provincial leaders were in operation before its sanction (Porto, 2004). By construction, this reform favoured both underdeveloped and unpopulated provinces, at the expense of advanced ones. This Law would last for 10 years, and even though it was modified in 1980, this redistributive principle remained until 1984. The period that goes from 1985 and 1987 was plagued by negotiations and short-term agreements between governors and the Federal Government. It led to a vulnerable grant system. In January 1988 a new Law was passed and it is still the main body of norms that regulates the system. These three years of negotiations are key for our identification strategy, therefore a more detailed analysis of this period is in Section 1.3.3.1.

From a political perspective, the country experienced more than 50 years of political turmoil. From 1930 to 1983, democratic governments where more or less frequently replaced by military counterparts. Thus, most of the fiscal arrangements that Porto (2009) mentions in many cases were not democratically supported. The period of democratic stability came only after 1983. One peculiar consequence of this instability is that at the end of 1983 re-election was banned at provincial and federal levels. In the next subsection, we will explore provincial constitutional reform and the pursuit of abolishing term limits.

1.3.2 Reforms to Term-limited Provincial Constitutions

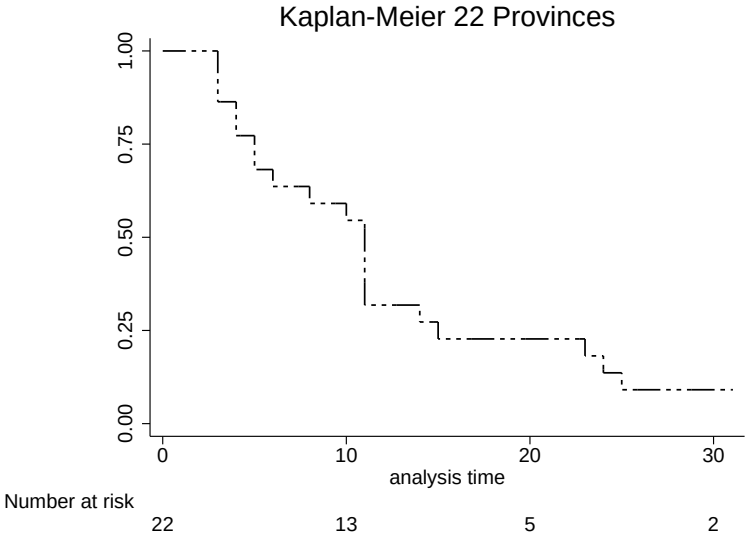
In the period that goes from 1984 to 2014 (31 years), a total of 28 episodes affecting term limits have been identified. They involve 20 out of the 24 jurisdictions in the country.

[8]Primarily income tax and VAT, but the confluence of several taxes to the pool constitutes a "Labyrinth" (Tommasi et al., 2001)

[9]Primary Distribution is between the Federal Government and Provinces.

[10]Defined as the difference in wealth with the most developed jurisdiction in the country, interpreted by an index closely related to Development Human Index (see Porto (2004) for further details on calculations.)

Figure 1.1: Kaplan-Meier Survival Estimates



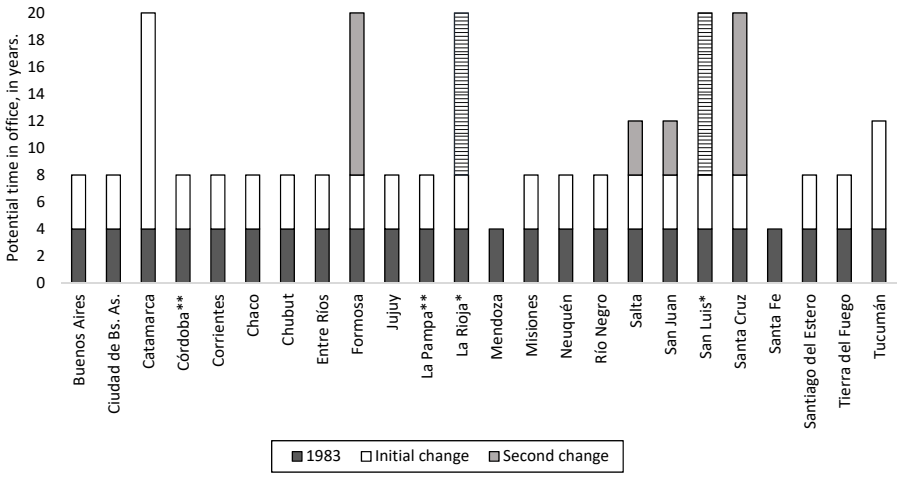
Notes: This Figure portraits the probability of "surviving" past time t, starting from 1984 (Time 0).

Tierra del Fuego and the City of Buenos Aires do permit one re-election, but they are not considered reformers as both jurisdictions were "born" with constitutions with re-election clauses. Previous to the year when their jurisdictional status changed (1991 for Tierra del Fuego and 1996 for City of Buenos Aires)), governors were appointed by the Federal Government. Using that sub-sample of 22 provinces, only Mendoza and Santa Fe currently ban re-election[11].

We can distinguish two waves of reforms: the early-reformers that started as soon as 1986, just three years after the return to democracy, and the wave in 1994, where 5 provinces passed constitutional reforms. In Figure 1.1 we show the Kaplan-Meier estimator, a non-parametric estimate of the probability of survival past time t. In 1984, time 0 in Figure 1.1, 22 provinces were at "risk" of reforming their constitutions. While in 1993, the probability of survival was 0.5455, by 1994 that probability had dropped to 0.3182. As we will see later, the Federal Constitution was reformed that year, and it formally demanded provinces to reform their constitutions to permit municipal autonomy.

[11]This dataset draws mainly on Almaraz (2010), Lucardi and Almaraz (2017), Altavilla (2017), and Liendo (2014). A number of discrepancies were found and cleaned. For instance, in the work of Ardanaz et al. (2014), Formosa is considered as having term limits where own investigations have found that the reform in 2003 included indefinite re-elections in its Article 132. Similarly, the authors consider that Salta allows one re-election, when it allows for 3 terms in office. We also find some differences with Liendo (2014)'s study of reforms to provincial constitutions. We have that Salta reformed the constitution in 1986, but it did not affect term limits; re-election was included in the reform of 1998 by Juan Carlos Romero. Similarly, when comparing figures with the work of Almaraz (2010), by 2007 the author affirms there were only two no-term-limited provinces, while there were three (Catamarca, Formosa and Santa Cruz).

Figure 1.2: Potential Mandate for the Incumbent



Notes: This Figure shows the maximum number of potential years in office, subject to winning a re-election bid. 20 years is used for no term limits. * La Rioja and San Luis reduced from no term limits to one re-election. ** In Cordoba, La Pampa and Tucuman, Eduardo Angeloz, Ruben Marin and Jose Jorge Alperovich ruled for three consecutive periods, even though the constitution only permits one re-election.

When faced with term limits, governors can skilfully conjure up constitutional devices to circumvent bans. Out of the 28 partial or complete reforms, four cases involved ambiguous (but lawful) interpretations of the fundamental Law; Cordoba in 1991, La Pampa in 1998, Santa Cruz in 1998, and Tucuman in 2006. In Cordoba, provincial judges interpreted that the new constitutional term limit only applied to the period under the rule of the new constitution (dated 1987); Angeloz's re-election as governor of Cordoba in 1987 was considered as if it were the first term. He was permitted to run and he effectively won in 1991. Ruben Marin in La Pampa used a similar approach, but he went through the provincial legislature. He pursued a partial modification on "re-election of governor and vice-governor" clause, and while total term limits were unaffected, the Law Nr. 1812 established period 1995-1999 as first term under the new constitution. He was authorised to run for re-election and he won. In Santa Cruz, unlimited re-election in 1998 was introduced by mechanisms not stipulated in the constitution (via referendum). Lastly, in Tucuman, the reform in 2006 included an Article (Nr. 159) that clarified that what followed was the first term. Thus, Jose Alperovich could run for three consecutive periods. Figure 1.2 depicts the current situation in terms of the potential mandate for governors across provinces.

The requirements for constitutional reforms are fairly similar across provinces (Almaraz, 2010; Lucardi and Almaraz, 2017). They can be grouped in two stages. The first step involves a provincial Law calling for constitutional reform. It normally includes specific details, such as the scope of reform (partial or complete), articles affected, and the request for Constitutional Assembly. This type of modifications normally demand "qualified majority" or 2/3 of the legislature votes (by both chambers in case it is a bicameral

system), but some provinces even demand 3/4 for complete reforms (i.e., Santiago del Estero). In the second step, the Constitutional Assembly is elected, the new constitution (or article) drafted, and the reform voted.

In Table 1.2, we detail modifications to provincial constitutions that affected term limits. We use the year the constitution was effectively sanctioned, although the time between the provincial Laws mandating reform and the constitution being sanctioned can substantially differ. We prefer this identification of the event for two main reasons. First of all, it is not guaranteed that when a reform has been called (by the legislature), it will effectively involve relaxing term limits. Corrientes (1993), Salta (1986), Santiago del Estero (1986), and Tucuman (1991) are examples of new constitutions with no alteration on term limits. Second, even if it does explicitly include relaxation of term limits, it is not certain that this reform will be sanctioned. Misiones in 2006 is an example of this, not only a Law calling for amendment passed, but also the Constitutional Assembly was formed. The reformers decided that there was no need for constitutional reform and ratified Article 110 of previous constitution (one re-election limit). In addition, in Table 1.2 we also include two cases that went in the "wrong" direction, reducing term limits from unlimited re-elections clauses (San Luis and La Rioja), and four cases where the initial reform did not relax term limits. Four provinces relaxed term limits more than once (Formosa, Salta, San Juan and Santa Cruz).

One crucial concern arises when comparing more than one reform per jurisdiction. After initial reforms, semi-flexibility was incorporated to some constitutions (for instance, La Rioja, Rio Negro, San Juan and San Luis (Corbacho, 1998)). In San Juan, the new article 277 of the 1986 reform introduced the figure of one-article amendment, and 2011 term-limit extension made use of it[12]. By comparing successive reforms, we will in part be capturing the effect of newly relaxed constitutional requirements. From a different perspective but with similar effects, Calvo and Micozzi (2005) find evidence that incumbency bias was introduced by constitutional and electoral reforms in Argentina provinces. In a scenario of increasing power concentration on the executive branch, subsequent reforms for the same jurisdiction are not necessarily comparable as the political game has been inclined in favour of the incumbent. In order to effectively assess the political impact on the likelihood of reforms, we restrict the analysis to 20 episodes of first modifications.

[12]One-article amendment adds flexibility to constitutions facilitating partial reforms. In this case, it incorporates the possibility of reforming one single article of the constitution. In addition to 2/3 of Legislators, the article 277 also demands popular vote in the "first subsequent election". It is relevant to notice that the 2011 modification of term limits was entirely based on this flexibility; only article 175 of 1986 Constitution was modified.

Table 1.2: Constitutional Reforms or Amendments Considered

Number	Province	Constitutional Reform Year	Term limit clause	Strategy Adopted	Law Mandating Constitutional Reform Year	Law Number	Source
1	Buenos Aires	1994	Re-election	Constitutional Reform	1993	11488	Provincial web page
2	Catamarca	1988	Unlimited	Constitutional Reform	1988	4522	*Sistema Argentino de Infomación Jurídica* (SAIJ)
3	Chaco	1994	Re-election	Constitutional Reform	1993	3952	*Sistema Argentino de Infomación Jurídica* (SAIJ)
4	Chubut	1994	Re-election	Constitutional Reform	1993	3924	Lucardi and Almaraz (2017)
5	Córdoba	1987	Re-election	Constitutional Reform	1986	7420	*Sistema Argentino de Infomación Jurídica* (SAIJ)
6	*Córdoba*	*1991*		*Clause interpretation*			
7	**Corrientes**	**1993**	**Unaffected**	**Constitutional Reform**	1992	4593	*Sistema Argentino de Infomación Jurídica* (SAIJ)
8	Corrientes	2007	Re-election	Constitutional Reform	2006	5692	*Sistema Argentino de Infomación Jurídica* (SAIJ)
9	Entre Ríos	2008	Re-election	Constitutional Reform	2007	9768	Provincial web page
10	Formosa	1991	Re-election	Constitutional Reform	1988	783	Provincial web page
11	Formosa	2003	Unlimited	Constitutional Reform	2002	1406	Provincial web page
12	Jujuy	1986	Re-election	Constitutional Reform	1985	4158	Lucardi and Almaraz (2017); Carrera (2001)
13	La Pampa	1994	Re-election	Constitutional Reform	1993	1523	*Sistema Argentino de Infomación Jurídica* (SAIJ)
14	*La Pampa*	*1998*		*Clause interpretation*			
15	La Rioja	1986	Unlimited	Constitutional Reform	1984	4469	Lucardi and Almaraz (2017)
16	La Rioja	2008	Re-election	Ammendment	2007	8135	*Sistema Argentino de Infomación Jurídica* (SAIJ)
17	Misiones	1989	Re-election	Ammendment	1988	2604	Provincial web page
18	Neuquén	1993	Re-election	Ammendment	1993	2039	Provincial web page
19	Río Negro	1988	Re-election	Constitutional Reform	1986	2087	*Sistema Argentino de Infomación Jurídica* (SAIJ)
20	**Salta**	**1986**	**Unaffected**	**Constitutional Reform**	1984	6269	*Sistema Argentino de Infomación Jurídica* (SAIJ)
21	Salta	1998	Re-election	Constitutional Reform	1997	6955	*Sistema Argentino de Infomación Jurídica* (SAIJ)
22	Salta	2003	Two re-elections	Constitutional Reform	2003	7232	*Sistema Argentino de Infomación Jurídica* (SAIJ)
23	San Juan	1986	Re-election	Constitutional Reform	1985	5419	*Sistema Argentino de Infomación Jurídica* (SAIJ)
24	San Juan	2011	Two re-elections	Ammendment	2011	8199	*Sistema Argentino de Infomación Jurídica* (SAIJ)
25	San Luis	1987	Unlimited	Constitutional Reform	1986	4702	*Sistema Argentino de Infomación Jurídica* (SAIJ)
26	San Luis	2007	Re-election	Ammendment	2006	XII-0545-2006	*Sistema Argentino de Infomación Jurídica* (SAIJ)
27	Santa Cruz	1994	Re-election	Constitutional Reform	1994	1887	Lucardi and Almaraz (2017)
28	Santa Cruz	1998	Unlimited	Ammendment	1998	2481	Lucardi and Almaraz (2017)
29	**Santiago del Estero**	**1986**	**Unaffected**	**Constitutional Reform**	1985	5500	*Sistema Argentino de Infomación Jurídica* (SAIJ)
30	Santiago del Estero	1997	Re-election	Constitutional Reform	1997	6377	*Sistema Argentino de Infomación Jurídica* (SAIJ)
31	**Tucumán**	**1991**	**Unaffected**	**Constitutional Reform**	1988	5903	Provincial web page
32	Tucumán	2006	Re-election	Constitutional Reform	2004	7469	*Sistema Argentino de Infomación Jurídica* (SAIJ)

Notes: This table includes constitutional reforms considered in this paper. It is not a comprehensive account of all constitutional reforms or amendment attempts, but only of those reforms that affected term limits. I also include 4 constitutional reforms that did not relax term limits but they were sanctioned before term limit relaxation in that jurisdiction (in bold letters). In italics, I include (lawful) interpretations of the first period affected by the reformed constitution where both incumbents managed to be re-elected for second time, even though they were term limited. *Constitutional Reform Year* is the official year the constitution was sanctioned. *Term Limit Clause* indicates the type of term limit relaxation. *Strategy Adopted* shows whether the reform took place via a constitutional reform (total or partial) or via amendment. *Law Mandating Constitutional Reform Year* is the year that the provincial law requiring the reform was passed. Provincial Law number is *Law Number*.

1.3.3 Initial Findings. Discrete-time Survival Analysis for Provinces and Governors

The following section examines the relationship between FTSA per capita and the probability of relaxing term limits using discrete-time survival analysis. We model the relaxation of term limits as "failure" events, and units, either provinces or governors, start failing at different points in time. Survival analysis seems appropriate in this case as there is very little cross-sectional variation at the level of provinces; 20 out of 22 jurisdictions have relaxed term limits. Timing of these reforms can reveal some information. First, in order to correctly identify the effect, in subsection 1.3.3.1 we discuss at length the particular characteristics of Argentina in 1984 that allow us to connect federal transfers and the likelihood of reform. We next introduce and explain our main variables of interest, which breathe life into the theoretical model in Section 1.2. After that, we use discrete-time survival analysis to explore correlations. We employ two different approaches. In the first one, we use the widely popular Cox model to incorporate the effect of time in the survival of term-limited provinces. We include a number of alternative model specifications, such as different definitions of the event or shorter periods. In the second one, we consider provincial heterogeneity across provinces by exploring the Linear Probability Model (LPM)[13]. Across all specifications, we present two alternative "subjects" of failure or units of analysis; governors and provinces. While the number of failures is 20 in both cases, this convenient modification allows us to move from 22 jurisdictions in "risk" of reform, to 113 term-limited governors.

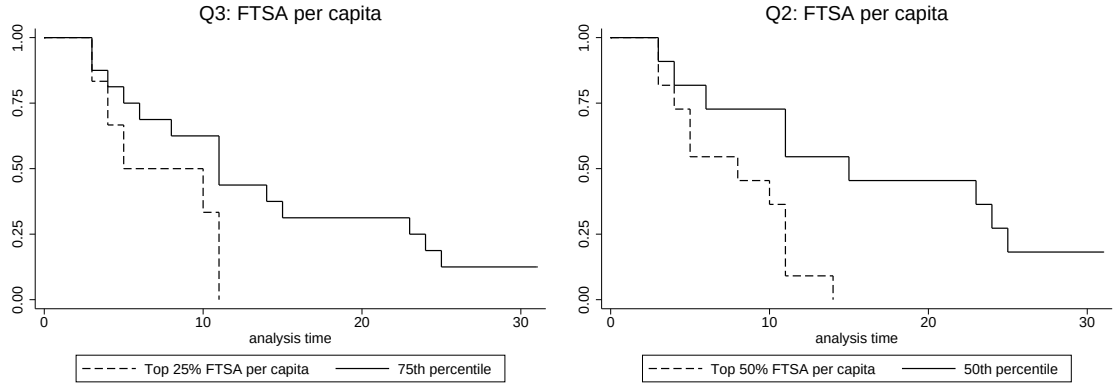
As a preview of the following analysis, in Figure 1.3 we disaggregate the Kaplan-Meier survival estimates using different percentiles of the distribution of FTSA per capita. Panel (a) shows the probability of surviving for the top 25% provinces that received higher FTSA per capita in 1984, compared to the survival estimate for the remaining provinces (75th percentile). Likewise, in panel (b) we grouped provinces in two: the dashed line corresponds to the survival estimate for the top 50% of provinces who benefited the most from automatic transfers from the Federal Government in 1984, and the solid line contains the other half of jurisdictions. As we can observe, the divergent rates in the survival functions are shorter for higher level of transfers.

1.3.3.1 Identification strategy

Two particular institutional features of Argentina after 1983 set the ground for our empirical strategy. First and foremost, we exploit the exogenous term limit faced by the ruling elite that took office, combined with the effect of a perceived more stable democracy. Secondly, we utilise two modifications made by the military government before calling elections in October 1983: the aggravation of malapportionment and the changes to the Federal Tax-sharing Agreement of 1973. This indeed implied a serious modification on the main structure by which the Federal Government transferred funds to provinces. In 1984, the Federal Tax-sharing Agreement had mutated to a fragile system, uncorrelated

[13] In Appendix A.4 we discuss methods to study time-series cross-section data with binary dependent variables (BTSCS). We particularly look at the fixed effect logit, also known as a conditional logit.

Figure 1.3: Kaplan-Meier Survival Estimates, per Percentiles of *FTSA pc* Distribution



(a) (b)

Notes: This Figure highlights the different survival probabilities for percentiles of the distribution of FTSA per capita. The dashed line is used to show top percentiles.

to objective indicators.

Enduring Democracy: After more than 50 years of institutional instability, the general elections in 1983 marked the return of the country to the democratic path. This time democracy would last. According to Gerchunoff and Llach (2010), the country had finally reached institutional consent on democratic rules. This was a result of a combination of factors. First of all, after six years of civil repression and economic collapse, the military government lacked substance or justification to remain in power, worsened by the defeat with Great Britain in the Malvinas/Falkland war in 1982 (Garro, 1993). Secondly, the triumph of *Unión Cívica Radical* (UCR) over the *Partido Justicialista* (PJ) signalled the return to the centre of the political spectrum[14]. Thirdly, and most importantly, President Raul Alfonsin's figure and his compromise with building democratic institutions were clear from the beginning (Nino, 1993; Garro, 1993; Stotzky, 1989; Gerchunoff and Llach, 2010). His initial agenda followed two substantial points: the decision to carry forward a thorough investigation on past human right abuses, in the so called "dirty war"(including an exemplary trial in 1985), and the creation of the Council for the Consolidation of Democracy (Garro, 1993).

The idea of constitutional reforms as a process for the legitimization of young democracies was part of a general wave across the continent in the early 1980's (Nino, 1993; Stotzky, 1989). In this fragile bloom, the elected incumbents in 1983 in Argentina, both at the national and at the provincial level, saw themselves with a particular institutional limit; re-election was banned. Provincial governors were practical enough to take advan-

[14]The UCR and the PJ are the two largest national parties in the country. Although both forces are best understood as catch-all and policy-shifting parties with federal scope, the UCR can be identified as a middle-centre party, while the PJ is more a working-class party (Jones et al., 2000)

tage of this institutional transition; if they were to "survive" in power, they needed to reform provincial constitutions.

Military Government Alterations: Unlike previous military governments, the 1976-1983 dictatorship made two important changes to the balance of political power and to the distribution of federal funds to provinces. On the one hand, before calling general elections in 1983, by Decree 22,847[15], the minimum number of Deputies per jurisdiction was increased from 4 to 5 in an attempt to reduce political power to the Justicialist Party (PJ by its Spanish acronym)(Galiani et al., 2016). The new National Congress exacerbated malapportionment as small provinces increased their representation. On the other hand, by a combination of factors, ranging from outdated coefficients (established in 1973), the implementation of pre-coparticipations (specific detractions from the general pool of taxes), and careless design of certain Laws[16], the system in place for federal transfers since 1973 had changed to something new in 1984. The range of modifications not only involved the primary distribution but also the coefficients that corresponded to each province (secondary distribution) (Porto, 2004).

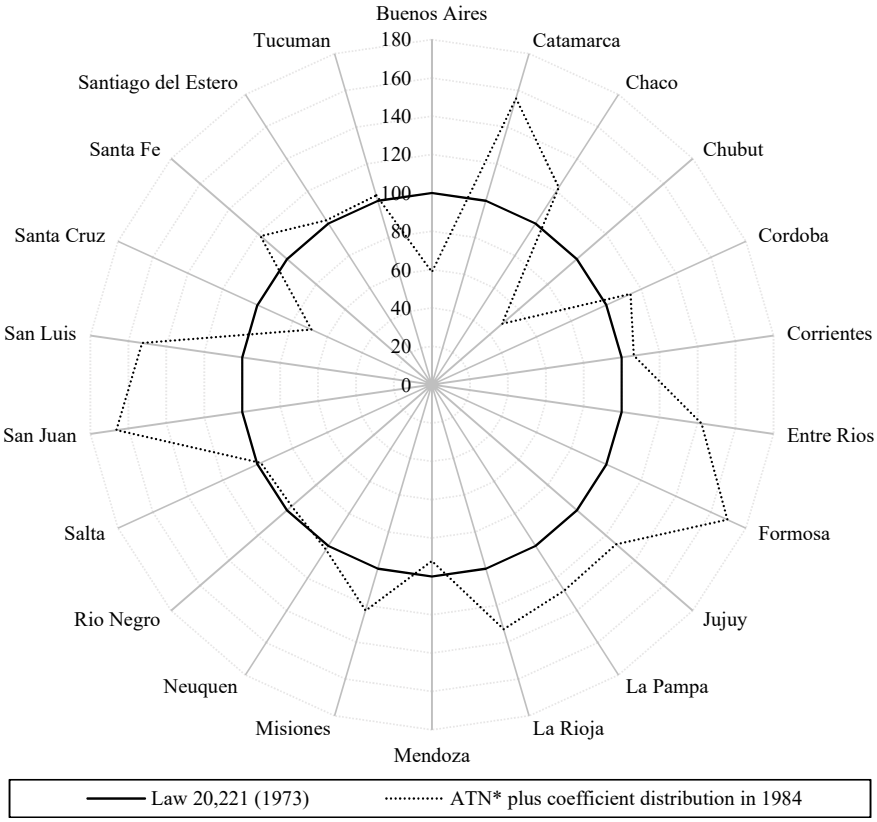
By reducing the total amount of funds received by provinces, the military government effectively hollowed out the 1973 Coparticipation Law. Combined with the new redistribution of seats at the National Congress, this made negotiations substantially more difficult. After 1984 provinces and the Federal Government could not reach a new accord and the Law effectively expired[17]. The inherited structure resulted in a period of fiscal disorganisation with extended use of discretionary national treasury contributions (ATN - *Aportes del Tesoro Nacional*). In practice, the system entered into chaos in 1985. This period finished in January 1988 with the sanction of the new tax-sharing agreement, Law 23,548 "Federal Coparticipation Law". Based on Porto (2004), in Figure 1.4 we can get an idea of the stark contrast between Law 20,221 coefficient distribution (normalized to 100) and what provinces obtained from the Federal Government in 1984. As we can observe, ATNs would become an important part of federal transfers to provinces in 1984-87 period. If Law 20,221 coefficients were based on an objective distribution criterion, 1984 transfer allocation had significantly departed from that purpose.

[15] July 1983.

[16] Especially Law 22,293 in 1980. This Military Law reduced the share of funds received by provinces vis-a-vis the Federal Government (primary distribution). According to (Porto, 2004), this Law implied a transference of 4.5% of total federal pool of taxes in the first year, and an additional 11.4% in 1981. Always in favour of the Federal Government.

[17] On December 1983, Law 20,221 was unilaterally prorogued for an extra year.

Figure 1.4: Military Government Alterations



Notes: In this Figure we contrast two distributions of Federal Funds, following Law 20,221 and using 1984 criteria. Law 20,221 (1973) coefficients are normalised to 100. Based on coefficients in Porto (2004). **Aportes del Tesoro Nacional (ATN)* are national treasury contributions.

Reformers vs Negotiators in 1985-1987: federal transfers can be endogenous to economic and political factors. Difficult to measure, political ability of some governors can explain both a higher coefficient of per capita transfers from the Federal Government and a provincial constitutional reform. If so, timing is of concern. Detecting a governor that first negotiated fiscal transfers, and once those funds were captured proceeded to relax term limits, would weaken the argument for the direction of the effect. We would argue that stability in the grant system would only be gained after 1988. We see discretionary funds in the absence of legal regime (in the form of ATN or any other arrangement) as unstable in nature, negotiable, temporal, and subject to conditions.

In order to tackle these concerns, we can split the sample in two, before and after the sanction of Coparticipation Law 23.548 (see the historic timeline in Table 1.3). After 1988, along the lines of Besfamille et al. (2017), we can rule out governors endogenously determining FTSA per capita. The reason is simple: coefficients have remained relatively unaltered and constant for the entire period after the 7th January 1988. Even more, given

Table 1.3: In Between Two Coparticipation Laws

1973	Sanction of Coparticipation Law 20,211.
1976	Military Coup.
1980	Coparticipation Law alteration: Law 22,293.
1983	Coparticipation Law 20,211 prorogued one year.
	Military Decree 22,847. 5 minimum number of seats per province in Congress.
	Democratic Elections in October.
1984	
1985	Collapse of FTSA system. Absence of a legal regime for federal transfers.
	Discretionary use of National Treasury Contributions (ATN).
1986	*Term limit relaxation in Jujuy, La Rioja and San Juan.*
	Temporary Financial Agreement.
1987	*Term limit relaxation in Cordoba and San Luis.*
	Provincial elections.
1988	New Coparticipation Law 23,548.
2014	Coparticipation Law 23,548 still in place.

Notes: This Table displays a timeline for the convulsed transition from the 1973 FTSA (Law 20,221) to the 1988 FTSA (Law 23,548). From 1976 to 1983 the country was ruled by military government. Term limits were relaxed in five provinces occurred before 1988.

that these coefficients are independent from any economic or political determinant, we can reject the possibility of incumbents affecting institutional or economic variables with the aim of increasing their share in the secondary distribution.

A period of intense bilateral negotiations between provinces and Federal Government occurred before 1988 (Saiegh and Tommasi, 1998). As we can observe in Table 1.3, provinces entered 1985 with no legal system regulating the distribution of the centrally collected pool of taxes. With no institutional or legal support, the Federal Government continued transferring funds on a daily basis until the sanction on 1985 Federal Budget (Porto, 2004). After a chaotic 1985, a Temporary Financial Agreement was reached in March 1986. Undoubtedly, it was an improvement from the previous year, but it never reached institutional consistency to a level comparable to Coparticipation Laws (20,221 and 23,548)[18]. The potential problem of finding an able governor manipulating federal grants and then reforming provincial constitution is particularly acute in this period. Therefore, we will attempt to alleviate potential endogeneity concerns by using a combination of features:

- Firstly, we actually attempt to measure political ability of governors. This is indi-

[18]The Financial Agreement was only meant to last for 1986 fiscal period, and although it was extendible for one year, it was subject to further revision of coefficients. Most importantly, the agreement in its Article 8 opened the door for a new round of negotiations that would end up with the sanction of the new Law in 1988.

rectly done by building a number of variables reflecting political and institutional differences across jurisdictions. They include Adjusted Malapportionment in National Congress, Party Coincidence with President, and provincial Executive Constraints (see below for more details).

- Secondly, as we can observe from Table 1.3, the grant system during this period was inherently unstable[19]. This is particularly relevant for term limit relaxation processes, as they normally involve more than one round of voting in provincial Legislature, and more than one fiscal year. Medium or long term compromises with legislators would require some constant influx of funds. Variability in grants only reveals that powerful governors never managed to secure higher level of transfers for more than one fiscal year. Furthermore, the five modifications of term limits that occurred in this time frame involved at least two fiscal years.

- Thirdly, between 1986 and 1987, a case-by-case analysis reveals that reform processes were independent of negotiations for funding. Out of the five reformers before 1988, Jujuy, La Rioja, and San Juan relaxed term limits in 1986, with provincial laws mandating constitutional reforms being passed by the end of 1985 (see Table (1.2)). Thus, we can eliminate the impact of the Temporary Financial Agreement on these jurisdictions. The remaining two provinces, San Luis and Cordoba, started reforms after the agreement. However, in both jurisdictions, the term limit relaxation process started in 1986 and finished in 1987. Again, the intrinsic instability of the settlement played a role. Funding for 1987 was not necessarily determined by what had been obtained in 1986.

- Fourthly, by using Linear Probability Model with fixed effects (see subsection 1.3.3.4), we attempt to control for time-invariant unobservable provincial characteristics.

In a nutshell, by the instability of the grant system in this period, the group of first reformers never reached an acceptable level of institutional consistency over future grants. Starting in 1984, the leaving dictatorship offered an exogenous change in the Coparticipation system, characterized by difficult negotiations and a shift in power in favour of relegated provinces. In the next subsection, we explain variables and model specification in more detail.

1.3.3.2 Variables Description

Our theoretical model depicts clear-cut effects from an increase in unearned revenue on the probability of turnover. Empirically, we materialize these results in the effect of the funds in the Federal Tax-Sharing Agreement (FTSA_{it}) on the probability of reforming the constitution to relax term limits. As mentioned before, the Autonomous City of Buenos Aires and Tierra del Fuego have been excluded from the analysis (see section 1.3.2) leaving in 22 the number of jurisdictions over 31 years (1984-2014).

[19]Porto (2004) elaborates this point further. From a comprehensive review on the history federal tax-sharing agreements in Argentina, the period that starts in 1973 tops the ranking in terms of instability and uncertainty.

Table 1.4: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Reformed Term Limits	269	0.074	0.262	0	1
FTSA per capita (Logs)	269	6.804	0.461	5.383	7.879
GGP per capita (Logs)	269	9.438	0.451	8.556	10.727
Executive Constraints	259	0.590	0.060	0.388	0.731
Discretionary Transfers pc (Logs)	268	4.593	1.242	0.544	7.736
Total revenues per capita (Logs)	269	7.739	0.455	6.724	9.296
Adjusted Malapportionment	269	0.670	0.458	0	2.763
Party coincidence with President	269	0.442	0.497	0	1
Human Development Index (HDI) Ranking	269	13.174	6.385	2	24

Notes: This Table provides summary statistics for the main variables of interests used in the paper.

The dependent binary variable, Reformed Term Limits, takes 1 if province i modified the constitution at time t (year) affecting term limits. We only consider first constitutional reforms that included some sort of re-election clause. Consequently, 20 episodes have been identified (269 observations are left in the data set; after the year of reform, the value for this variable goes to missing). In Table 1.4 we can observe descriptive statistics for the covariates used in the panel data set.

In an attempt to capture different political conditions in each province by year, Executive Constraints and Adjusted Malapportionment variables were created. Lucardi and Almaraz (2017) find evidence that powerful incumbents and divided opposition have opened the gate for constitutional reforms that pursued alterations of term limits in Argentinian provinces. Executive Constraints (θ_{it}) is a measure of local political power. It consists of a simple average of the votes obtained by the governor (% votes$_{it}$), the difference in votes with second candidates in the closest election (% difference$_{it}$), and the number of seats in the provincial legislature -there can be up to two chambers per province- (% seats$_{it}$). Once averaged, we subtract it from 1, i.e., the closest is θ_i to one, the harder the executive constraints faced by the incumbent. The following expression is calculated;

$$\text{Executive Constraints}_{it} = \theta_{it} = 1 - \Big[\frac{1}{3}(\%\ \text{votes}_{it}) + \frac{1}{3}(\%\ \text{difference}_{it}) + \frac{1}{3}(\%\ \text{seats}_{it})\Big]$$

Where i stands for provinces and t for years. Provincial elections for Governor normally take place every four years, unless there is some unexpected event that forces otherwise. Nonetheless, for legislature, mid-term elections every two years are common across jurisdictions. With no re-election permitted, one incumbent can face up to two different Executive Constraints, depending whether or not there were mid-term elections[20]. Elections are normally held in October, and the seats in the Legislature are taken in December, therefore we lag Executive Constraints variable in order to effectively measure the political landscape faced by the incumbent in power[21].

[20]In comparison with other observations, there are 10 missing values in this variable as there is no information on the distribution of seats in the provincial legislature for *Salta* in 1991, 1993, and 1995 (6 missing values), and for *Tucuman* in 1987 election (4 missing values)

[21]The only exception is Santiago del Estero in 1997. constitutional reform was officially dated the 29th

The second variable is Adjusted Malapportionment, a measure of national political influence. Each jurisdiction has a non-proportionally distributed number of seats in National Congress (see Galiani et al. (2016) or Ardanaz et al. (2014)). Even though there is also malapportionment in the Senate, we only focus on the Chamber of Deputies[22]. If we divide the proportion of total seats each province has in Congress by its fraction of the total population of the country, we will get a measure of malapportionment (one if representation is proportional)[23]. The distribution of seats has remained fixed since 1983, except for an increase in 3 in 1991 as a consequence of the creation of a new jurisdiction *Tierra del Fuego*, which moved the total to 257. We circumvent this relatively time-invariability by adjusting malapportionment by the percentage of those seats that belong to the same party as the governor in Federal Congress. We use the following formula;

$$\text{Adjusted Malapportionment}_{it} = (\%\ \text{Seats Congress}_{it}) * \text{Malapportionment}_{it}$$

Governors exert a powerful grip on national legislators (Galiani et al., 2016; Jones et al., 2002; Jones and Hwang, 2005). The time variation in the data (t) is given by the fact that 1/2 of the chamber is renewed every two years. However, the minimum of zero for Adjusted Malapportionment in Table 1.4 points out that it is not odd to see cases where the party of the incumbent did not win any seat at the Federal Congress. For the same reasons as for the Executive Constraints I lag this variable.

This variable, "Adjusted Malapportionment", allows us to control for a number of aspects. First, negotiations for the share in the FTSA (predominately in 1985-87) can be influenced by the power the jurisdiction has in National Congress. If we do not account for this, the error term will be affected, making it harder to sustain certain assumptions (see below for more details on this). Secondly, a politically powerful province but with a low FTSA per capita can obtain extra revenues by triggering discretionary funding from the central government. If that is the case, the effect on the probability of reform from FTSA will be diminished. For that reason, we also control for Discretionary Transfers. Thirdly, the Federal Government can intervene in provinces under different clauses (to guarantee the republican form of government for instance)[24]. Since the power to intervene in provinces belongs to the Congress, the more powerful is the province, the less likely will be an intervention in the event of a provincial constitutional reform. All other things constant, a province with low FTSA per capita but powerful in the Congress can try to block any intervention in the face of an institutional reform not supported by the Federal

December 1997, and the closest previous elections was held in October 1997.

[22]The main reason is that Senators were not directly elected before the National Constitutional Reform in 1994.

[23]For instance, *Buenos Aires* makes up the 38% of population of the country, but the total proportion of seats in National Congress is 27% (70 out of 257). On the other extreme, *Santa Cruz* have a population equivalent to 0.05% of that of the country and enjoys a representation in Congress of 1.9% of seats.

[24]Since 1983, there have been six federal interventions in four provinces. According to Gervasoni (2010), in at least four of them the incumbent in the province showed authoritarian behaviour. As an special case, in 2004 *Santiago del Estero* was intervened and the provisional government called for a partial reform of the provincial constitution (Provincial Law Nr. 6,667). Even though the Supreme Court of Justice considered this unlawful a month later (*Zavalía, José Luis c/ Provincia de Santiago del Estero y Estado Nacional s/ Amparo.*), a constitutional reform would pass a year later when the province was no longer intervened.

Government (for instance one that includes indefinite re-elections). On similar grounds, we include Party coincidence with a President dummy, which takes 1 if there is coincidence. On average, provincial governors shared the same party affiliation as the President 44.2% of the time, but with an enormous variation in the data.

Finally, we use Gross Geographic Product (GGP) per capita (see Appendix A.2.1 for a detail on sources used for calculation), and Ranking of Human Development Index (HDI) to approximate human capital in each jurisdiction. The HDI variable is composed by measures of poverty, education and income[25]. In Table 1.4 we can observe that the highest value for HDI ranking is 2[26].

1.3.3.3 Cox Model - Provinces and Governors

At the expense of assuming a proportional hazard, the Cox model is a straightforward way of using the powerful tools of survival analysis. The Cox specification presents certain advantages over other alternatives. In particular, it allows for a natural way of dealing with censoring and with tied events. In our case, the existence of tied events can be potentially troublesome: three provinces reformed the constitution in 1986 and five did it in 1994 (see Figure 1.1). The Cox proportional hazards regression model presents the following structure:

$$h_i(t) = h_0(t) \exp(\beta' \mathbf{x}) \tag{1.25}$$

The covariates multiplicatively shift the baseline hazard function. There is no specific assumption about the shape of the hazard, except for being the same for everyone[27]. The theoretical model guides our empirical modelling. We depart from a general specification that only includes controls strictly defined by theory, that is, FTSA per capita, GGP per capita and Executive constraints (for R, w and θ respectively, see Section 1.2), and end up in a full model with a number of variables and interactions. In Appendix A.3, there is a detailed discussion on goodness of fit and preferred baseline model.

Table 1.5 is divided in two panels depending on whether we use provinces (Panel A) or governors (Panel B) as units of analysis. Specifications gradually increase the number of controls, including, in model 3 for instance, growth of fiscal and economic variables. Models 4(10) to 6(12) replicate the previous three estimations, but with interactions among FTSA per capita, Executive Constraints and GGP per capita. Apart from the unambiguous effect of FTSA per capita (we can observe that FTSA per capita remains statistically significant across specifications), it is not easy to generalise conclusions for other variables. Executive Constraints shows the expected coefficient sign, that is, the higher the political

[25] United Nations Development Programme (UNDP) calculates the HDI for years 1996, 2001, 2006 and 2011. For the previous 13 years, we use the Composite Index developed by Russo (1997) for 1980 and 1991. Since both methodologies differ substantially, we only use the ranking ordering of the different indexes which goes from 1, for the most developed jurisdiction, to 24.

[26] The Autonomous City of Buenos Aires is the most developed jurisdiction of the country, but we are not including this jurisdiction in the analysis. The minimum of 24 in this ranking can also be interpreted by noticing that we are not including Tierra del Fuego either.

[27] The Cox model can be approached to a BTSCS using a Complementary log-log (Cloglog) link (Beck et al., 1998).

Table 1.5: Survival Time Analysis Applied to Provinces and Governors

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Unit of Analysis: Provinces						
FTSA per capita (Logs)	1.173^{+}	2.898^{++}	3.050^{+}	1.670^{+++}	2.983^{++}	2.862
	(0.610)	(1.406)	(1.649)	(0.588)	(1.398)	(1.811)
GGP per capita (Logs)	-0.150	3.280^{+}	3.561^{++}	0.191	3.115^{++}	3.061^{+}
	(0.428)	(1.705)	(1.623)	(0.525)	(1.363)	(1.687)
Executive Constraints	-5.267	-9.739^{++}	-11.12^{+++}	-5.472	-9.677^{++}	-10.14^{++}
	(3.203)	(3.967)	(4.304)	(4.823)	(4.916)	(4.805)
FTSA per capita (Logs)(*) × GGP per capita (Logs)(*)				-2.513	-1.676	-1.949
				(1.682)	(2.051)	(2.016)
FTSA per capita (Logs)(*) × Executive Constraints(*)				-0.0326	2.265	-0.0574
				(8.261)	(10.59)	(9.832)
GGP per capita (Logs)(*) × Executive Constraints(*)				5.584	8.214	7.325
				(7.691)	(9.454)	(8.737)
Control Covariates		Yes	Yes		Yes	Yes
Growth Covariates			Yes			Yes
Estimation Method	Cox M.	Cox M.	Cox M.	Cox M.	Cox M.	Cox M.
Nr. of Subjects	22	22	22	22	22	22
Nr. of Failures	20	20	20	20	20	20
Observations	237	236	235	237	236	235
	(7)	(8)	(9)	(10)	(11)	(12)
Panel B: Unit of Analysis: Governors						
FTSA per capita (Logs)	0.487	2.639^{+}	2.970^{+}	0.358	2.358^{+}	2.667^{+}
	(0.458)	(1.434)	(1.615)	(0.508)	(1.344)	(1.583)
GGP per capita (Logs)	-0.00761	1.889^{++}	1.919^{++}	0.0378	1.934^{++}	1.989^{++}
	(0.370)	(0.870)	(0.930)	(0.459)	(0.870)	(0.971)
Executive Constraints	-0.412	-0.432	-0.597	-2.299	-2.462	-2.300
	(1.650)	(1.891)	(1.844)	(2.343)	(2.711)	(2.379)
FTSA per capita (Logs)(*) × GGP per capita (Logs)(*)				0.0322	0.0584	-0.170
				(0.916)	(1.021)	(1.062)
FTSA per capita (Logs)(*) × Executive Constraints(*)				5.530	5.608	5.349
				(4.543)	(4.371)	(4.180)
GGP per capita (Logs)(*) × Executive Constraints(*)				1.729	2.110	2.079
				(4.625)	(5.031)	(5.524)
Control Covariates		Yes	Yes		Yes	Yes
Growth Covariates			Yes			Yes
Estimation Method	Cox M.	Cox M.	Cox M.	Cox M.	Cox M.	Cox M.
Nr. of Subjects	113	113	113	113	113	113
Nr. of Failures	20	20	20	20	20	20
Observations	545	544	543	545	544	543

(*) Mean centred variables.

Standard errors clustered by provinces in Panel A, by governors in Panel B. $^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table presents the first set of initial findings. Using the Cox model we estimate the effect FTSA per capita (in logs) on the likelihood of relaxing term limits. In Panel A, we use as subject of failure the 22 provinces. In Panel B, we change the subject to 113 term-limited governors. We gradually include Control Covariates (*Discretionary Transfers pc (Logs), Total revenues per capita (Logs), Adjusted Malapportionment, Party coincidence with President, Human Development Index (HDI) Ranking*), and Growth Covariates (*Growth FTSA pc* $(t-1)$*, Growth difference GGP vs GDP* $(t-1)$*, Growth GGP pc* $(t-1)$*, Growth discretionary transfers pc* $(t-1)$*, Growth total revenues pc* $(t-1)$.). Across all specifications a significant and positive effect of FTSA per capita is observed.

constraints, the less likely the incumbent will push for a constitutional reform. However, in some specifications this variable is not significant. Similar conclusions can be obtained for GGP per capita.

A back of the envelope calculation gives that one standard deviation increase in the log of FTSA per capita has a positive effect on the probability of reform between 72.9% and 315%[28]. On the other hand, the point estimate for a one standard increment in Executive Constraints reduces the hazard of term limit relaxation by between 27% and 49%. In Appendix A.3 I perform a wide range of tests on the assumptions on which the Cox model is based. I find no evidence that specifications violate the proportional-hazard assumption or that there is multicollinearity among variables (we were concerned on FTSA per capita (Logs) with Total revenues per capita, or Executive Constraints with Adjusted Malapportionment). Overall, Models 1 and 3 seem to show better fit.

Exploring alternatives: In Table 1.6 we perform a number of alterations to the Cox specification to check consistency of results. These extensions can be grouped in three. First, Royalties are included, a source of revenue that shares similar characteristics to FTSA per capita. Secondly, the period under analysis is reduced to before 1994, the year the National Constitution was reformed in the country. And third, we use two different dependent variables capturing alternative expressions of event year; the first constitutional reform (model 4), irrespective from whether or not it affected term limits, and the provincial call for constitutional reform (model 5).

The first two models involve considering Royalties. This source of revenues deserves particular attention as it is very similar to FTSA: local constituencies only perceive indirect benefits as they do not bear the direct burden of the tax. Some authors emphasise the combined effect of both FTSA and Royalties on subnational behaviour (Besfamille et al., 2017). 18 out of 24 jurisdictions receive some type of royalties (17 out of 22 in our working sample), and for some provinces, they represent a relevant proportion of revenue. According to the authors, Chubut, Santa Cruz and Tierra del Fuego, collect more revenues from royalties than from provincial taxes. Empirically working with royalties is not straightforward. Given that we are using per capita logarithms, for those jurisdictions that do not collect this concept we face the difficulty of missing values for Log (0). We have dealt with this by using a conservative approach creating a new variable that consist on logs of FTSA *plus* Royalties per capita. Two alternatives are presented, one that separates both variables (FTSA per capita and FTSA + Royalties per capita) in model 1(6), and one that only uses the combined variable in model 2(7). We get mixed results depending on whether we are observing as provincial (Panel A) or governors subjects of failure (Panel B). These results seem to point out that incumbents perceive these two sources of revenues in a different way. Nonetheless, even in that scenario, FTSA per capita seems to have a positive effect on the probability of reforming.

[28] I use the following formula (Box-Steffensmeier and Jones, 2004), evaluated at mean values:

$$\%\Delta h(t) = [\frac{e^{(\beta_i(x_i=X_2))} - e^{(\beta_i(x_i=X_1))}}{e^{(\beta_i(x_i=X_1))}}]$$

Table 1.6: Exploring Alternatives, Cox model

	Including Royalties		Before 1994	Different failure event	
	(1)	(2)	(3)	(4(*))	(5(**))
Panel A: Unit of Analysis: Provinces					
FTSA per capita (Logs)	3.603^{++}		3.763^{+++}	3.120^{++}	3.458^{+++}
	(1.416)		(1.176)	(1.398)	(1.159)
FTSA + royalties per capita (Logs)	-2.840	-0.805			
	(2.954)	(2.672)			
GGP per capita (Logs)	3.406^{++}	1.495	4.123^{+++}	2.492	3.046^{++}
	(1.618)	(1.028)	(1.468)	(1.648)	(1.357)
Executive Constraints	-9.411^{++}	-5.883	-6.607	-10.48^{++}	-7.806^{++}
	(4.611)	(4.772)	(4.924)	(4.887)	(3.468)
Control Covariates	Yes	Yes	Yes	Yes	Yes
Nr. of Subjects	22	22	22	22	22
Nr. of Failures	20	20	15	20	20
Observations	236	236	153	190	214
Pseudo R^2	0.179	0.129	0.196	0.177	0.122
	Including Royalties		Before 1994	Different failure event	
	(6)	(7)	(8)	(9(*))	(10(**))
Panel B: Unit of Analysis: Governors					
FTSA per capita (Logs)	2.106		2.292^{+}	2.314^{+}	1.565
	(1.281)		(1.317)	(1.371)	(1.118)
FTSA + royalties per capita (Logs)	1.324	2.227^{+}			
	(1.399)	(1.351)			
GGP per capita (Logs)	1.907^{++}	0.916	2.823^{++}	1.577^{+}	1.248
	(0.892)	(0.716)	(1.165)	(0.816)	(0.859)
Executive Constraints	-0.783	-1.056	-2.025	-0.301	-2.489
	(1.953)	(2.141)	(3.743)	(2.102)	(1.954)
Control Covariates	Yes	Yes	Yes	Yes	Yes
Nr. of Subjects	113	113	113	113	113
Nr. of Failures	20	20	15	20	20
Observations	566	566	201	581	559
Pseudo R^2	0.058	0.036	0.070	0.056	0.043

Standard errors clustered by provinces in Panel A, by governors in Panel B.

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table extends previous initial findings by exploring new alternatives. These extensions include accounting for Royalties, reducing the period of study before 1994, and using two competing events; (*)only constitutional reforms and (**) only provincial call for reform. We continue using the Cox model to estimate the effect FTSA per capita (in logs) on the likelihood of relaxing term limits. In Panel A, we use as subject of failure the 22 provinces. In Panel B, we change the subject to 113 term-limited governors. We gradually include Control Covariates (*Discretionary Transfers pc (Logs), Total revenues per capita (Logs), Adjusted Malapportionment, Party coincidence with President, Human Development Index (HDI) Ranking*), and Growth Covariates (*Growth FTSA pc* $(t-1)$*, Growth difference GGP vs GDP* $(t-1)$*, Growth GGP pc* $(t-1)$*, Growth discretionary transfers pc* $(t-1)$*, Growth total revenues pc* $(t-1)$.). Across all specifications a significant and positive effect of FTSA per capita is observed.

In model number 3(8), the reform of the National Constitution in 1994 is considered. According to its new Article 123, *"...each province enacts its own constitution as stated in Section 5, ensuring municipal autonomy and ruling its scope and content regarding the institutional, political, administrative, economic and financial aspects"* (National Constitution, Article 123). This particular mandate pressed provinces into reforming their own provincial constitutions to safeguard municipal autonomy. In order to avoid confounding external political and institutional factors that may influence the incumbent, we restrict the analysis to 1984-1994 period. Even though less efficient as we drop a number of observations, FTSA per capita remains significant.

Lastly, reforming a provincial constitution demands political leverage. Presumably, including an article to relax term limits even more so. In models 4(9) and 5(10), we use different dependent variables accounting for such demonstrations of power. What differs in these two specifications is the notion of a failure event. In model 4, we use first constitutional reforms even if they did not effectively include re-election clauses. Most of them affected term limits, but provinces as Corrientes, Salta, Santiago del Estero, and Tucuman passed innocuous reforms in terms of periods in office. Again, even though we lose some observations, the results are quite similar to that of previous models: FTSA per capita keeps explanatory power. Based on Table 1.2, we consider model 5. In this specification, the dependent variable (event) is the year the provincial legislature passed a law mandating a constitutional reform. Although these events show political power, it is important to notice that for some reforms there was a considerable gap between the Law and the reform. Formosa, for instance, passed the Law mandating a constitutional reform the 8th of September 1988, and the constitution was sanctioned the 3rd of April 1991. In other cases, the reform did not materialise at all (Misiones 2006). As observed, the significance of FTSA per capita remain just as significant[29].

1.3.3.4 Considering Heterogeneity - Linear Probability Model

A general critique to the Cox model is that we are making strong assumptions with respect to the distribution of the unobserved heterogeneity (see Section A.4 for a more detailed discussion on this). In order to address this, we will exploit the panel structure of the data. Although this section is centred on the Linear Probability Model (LPM) with provincial and governor fixed effects, the analysis is extended to the conditional logit in Appendix A.5. Given that there is no time variation in the dependent variable, we lose data on two provinces that did not reform the constitution. However, the main advantage lies on not having to make specific assumptions on the correlation between individual heterogeneity and predictors. Equally important is the fact that it allows us to control for provincial-specific time-invariant variables, predominately among those, institutional factors. As can be seen from Table 1.7 (below) FTSA per capita continues to be relevant and significant in explaining term-limit variable. This Table displays the LPM with fixed effects. While models 1 to 6 only include provincial effects, from 7 to 12 we also add governor dummies. It is worth mentioning that in these specifications, the interpretation of coefficients is

[29]It is worth mentioning that we have also analysed the inclusion of inflation, as a control for macroeconomic instability, but results were not altered (not shown).

different; an increase in 1% of FTSA funding per capita would increases the probability of reforming the constitution in a range that goes from 1.24% to 3.22%.

Thus far, it has been argued that there is a significant correlation between FTSA per capita and the probability of pursuing modifications of term limits. This section began by describing the identification assumptions that helped us build a case for one particular direction of effect. It went on to describe two econometric methods, the Cox model and the Linear Probability Model, using either provinces or governors as unit of analysis. What follows is a discussion on causal effects of FTSA per capita. federal transfers are instrumented by constructing a new variable, "*Aggravated* Malapportionment".

Table 1.7: Linear Probability Model with Provincial and Governor Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Unit of Analysis: Provincial Fixed Effects						
FTSA per capita (Logs)	0.124^{+++}	0.181^{+++}	0.249^{+++}	0.213^{+++}	0.272^{+++}	0.322^{+++}
	(0.0316)	(0.0473)	(0.0856)	(0.0513)	(0.0588)	(0.0937)
GGP per capita (Logs)	-0.0282	0.0853	0.0797	-0.0449	0.0555	0.0356
	(0.124)	(0.192)	(0.200)	(0.171)	(0.218)	(0.230)
Executive Constraints	-0.704	-0.615	-0.512	-1.008^{+}	-0.919^{+}	-0.811
	(0.494)	(0.506)	(0.487)	(0.489)	(0.506)	(0.500)
FTSA per capita (Logs)(*) × GGP per capita (Logs)(*)				0.139	0.183	0.170
				(0.150)	(0.144)	(0.132)
FTSA per capita (Logs)(*) × Executive Constraints(*)				-1.865^{+++}	-1.843^{++}	-1.838^{+++}
				(0.652)	(0.669)	(0.649)
GGP per capita (Logs)(*) × Executive Constraints(*)				0.486	0.641	0.664
				(1.101)	(1.129)	(1.039)
Control Covariates		Yes	Yes		Yes	Yes
Growth Covariates			Yes			Yes
Governor Fixed Effects	No	No	No	No	No	No
Provincial Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	259	258	254	259	258	254
Adjusted R^2	0.024	0.022	0.060	0.048	0.047	0.083
	(7)	(8)	(9)	(10)	(11)	(12)
Panel B: Unit of Analysis: Provincial and Governor Fixed Effects						
FTSA per capita (Logs)	0.0795	0.125^{+}	0.128	0.138^{++}	0.209^{++}	0.260^{+}
	(0.0478)	(0.0719)	(0.120)	(0.0573)	(0.0792)	(0.135)
GGP per capita (Logs)	0.0301	-0.00165	-0.0632	-0.0696	-0.237	-0.360
	(0.221)	(0.310)	(0.325)	(0.164)	(0.218)	(0.339)
Executive Constraints	-0.974	-0.451	-0.290	-0.654	0.565	0.910
	(0.891)	(0.898)	(0.917)	(1.090)	(1.299)	(1.303)
FTSA per capita (Logs)(*) × GGP per capita (Logs)(*)				0.0401	0.102	0.122
				(0.118)	(0.137)	(0.157)
FTSA per capita (Logs)(*) × Executive Constraints(*)				-1.154	-1.101	-1.276
				(0.772)	(0.821)	(0.853)
GGP per capita (Logs)(*) × Executive Constraints(*)				1.780	3.213	3.374
				(1.950)	(2.254)	(1.993)
Control Covariates		Yes	Yes		Yes	Yes
Growth Covariates			Yes			Yes
Governor Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Provincial Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	259	258	254	259	258	254
Adjusted R^2	0.239	0.232	0.243	0.241	0.244	0.257

(*) Mean centred variables.

Standard errors adjusted for 22 clusters in provinces. $^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table displays the LPM estimations. In Panel A, we only account for provincial fixed effects. In Panel B, we combine both, provincial and governor fixed effects. We gradually include Control Covariates (*Discretionary Transfers pc (Logs), Total revenues per capita (Logs), Adjusted Malapportionment, Party coincidence with President, Human Development Index (HDI) Ranking*), and Growth Covariates (*Growth FTSA pc* $(t-1)$, *Growth difference GGP vs GDP* $(t-1)$, *Growth GGP pc* $(t-1)$, *Growth discretionary transfers pc* $(t-1)$, *Growth total revenues pc* $(t-1)$.). Across all specifications the probability of reforming the constitution to relax term limits is positively correlated to FTSA per capita.

1.3.4 Instrumenting Federal Transfers

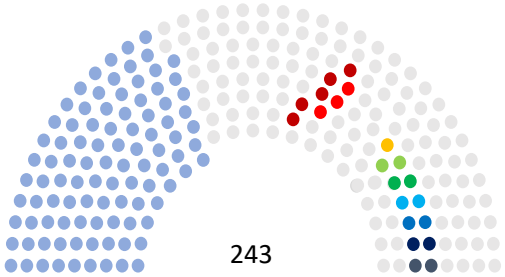
As discussed above, it has been argued that there is a close and significant relationship between FTSA per capita and the likelihood of reform. However, the period that runs from 1984 and 1988 involved intense negotiations between provinces and the Federal Government regarding the FTSA (see section 1.3.3.1). Some concerns arise on the potential endogeneity of federal transfers over these years. After 1988, and following Besfamille et al. (2017), we can safely assume funding from FTSA to be exogenous[30]. In January 1988 a new Federal Tax-sharing Agreement was reached and it would last more than 30 years.

In what follows, we draw from Galiani et al. (2016) in using malapportionment to instrument "FTSA per capita". Being a generalised phenomenon, malapportionment originates in the political over-representation (under) of smaller (larger) jurisdictions in Legislatures. In a slight modification, I use "Aggravated Malapportionment", defined as the number of seats won (or lost) by provinces after adjustments in Congress. Two exogenous modifications are exploited, one in 1983 and the other in 1991. First, following our discussion in section 1.3.3.1, as a consequence of Military Decree 22,847 in 1983, the total number of seats in Congress was increased in eleven units before elections. Meant to be proportional, in an already malapportioned Congress, the increase in total seats affected all jurisdictions, not only those provinces that improved their representation. Second, in 1991 a new province was incorporated to the federal structure of the country, Tierra del Fuego. Accordingly, three new seats were added and thus affecting overall distribution of political power. Figure 1.5 exemplifies our instrument by using 1983 military alterations. First, in sub-figures 1.5a and 1.5b, we contrast a proportional Congress with how it actually looked like in 1982. From sub-figure 1.5c we can appreciate how the increase in eleven seats further affected the political representation and the balance in Congress.

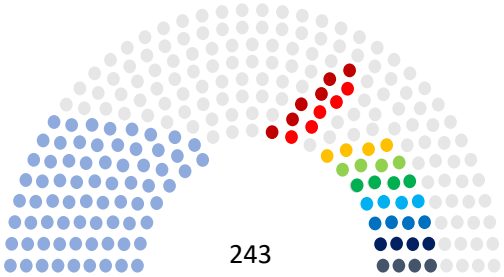
Table 1.8 displays the actual calculations for "Aggravated Malapportionment". As previously mentioned, two effects stand out when the number of seats is modified. First, there is a reduction in representation of provinces compared to those jurisdictions that increased the number of seats. Second, the overall impact will depend on how malapportioned each jurisdiction was before the modification. For instance, Buenos Aires, previous to 1983, was under-represented by 26.3 seats, while in 1983, that number reached 28.6 seats, even though 2 seats were added in that year. Thus, the net effect for Buenos Aires was a loss in representation of 2.3 seats. The last two columns of the Table 1.8 calculate winners and losers resulting from the two modifications in 1983 and in 1991.

[30] As discussed in section 1.3.3.1, current FTSA is based on fixed and arbitrary coefficients, not by formula.

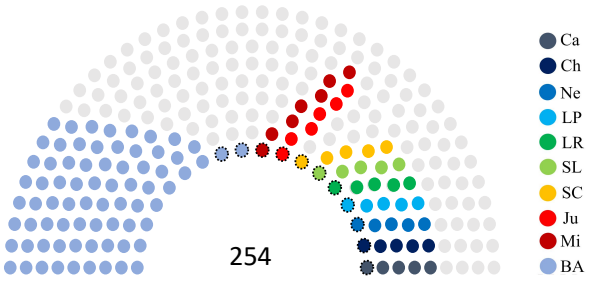
Figure 1.5: Aggravated Malapportionment in Congress 1983



(a) Proportional Distribution of Seats - 1982



(b) Actual Distribution of Seats in 1982



(c) Distribution of Seats in 1983

Notes: This Figure presents how our variable "Adjusted Malapportionment" operates. We identify the change in representativeness in ten provinces that were apportioned eleven seats in 1983. Sub-figure 1.5a estimates a proportional Congress in 1982; 243 seats distributed according to provincial population. In sub-figure 1.5b, the actual distribution of seats is portrayed. Lastly, in sub-figure 1.5c we can observe the effect of increasing eleven seats in 1983, and how it aggravates the already malapportioned congress.

Table 1.8: Aggravated Malapportionment, 1983 and 1991

	Allocated Seats			Population Share		Proportional Nr. Seats			Malapportionment			Aggravated Malapportionment	
	1973-1982	1983-1991	1991-2014	1983	1991	1982	1983-1991	1991-2014	1982	1983-1991	1991-2014	1983-1991	1991-present
	(a)	(b)	(c)			(d)	(e)	(f)	(G)=(a)-(d)	(H)=(b)-(e)	(I)=(c)-(f)	(H)-(G)	(I)-(H)
Buenos Aires	68	70	70	38.8%	38.6%	94.3	98.6	99.2	-26.3	-28.6	-29.2	-2.27	-0.62
Capital Federal	25	25	25	10.1%	9.1%	24.5	25.6	23.4	0.5	-0.6	1.6	-1.11	2.22
Catamarca	4	5	5	0.8%	0.8%	1.8	1.9	2.1	2.2	3.1	2.9	0.92	-0.15
Chaco	7	7	7	2.5%	2.6%	6.1	6.4	6.6	0.9	0.6	0.4	-0.28	-0.19
Chubut	4	5	5	1.0%	1.1%	2.4	2.5	2.8	1.6	2.5	2.2	0.89	-0.32
Cordoba	18	18	18	8.6%	8.5%	20.9	21.8	21.8	-2.9	-3.8	-3.8	-0.94	0.00
Corrientes	7	7	7	2.4%	2.4%	5.8	6.1	6.3	1.2	0.9	0.7	-0.26	-0.20
Entre Rios	9	9	9	3.2%	3.1%	7.8	8.2	8.0	1.2	0.8	1.0	-0.35	0.13
Formosa	5	5	5	1.1%	1.2%	2.7	2.8	3.1	2.3	2.2	1.9	-0.12	-0.34
Jujuy	5	6	6	1.5%	1.6%	3.6	3.8	4.0	1.4	2.2	2.0	0.84	-0.24
La Pampa	4	5	5	0.8%	0.8%	1.8	1.9	2.0	2.2	3.1	3.0	0.92	-0.12
La Rioja	4	5	5	0.6%	0.7%	1.5	1.6	1.7	2.5	3.4	3.3	0.93	-0.19
Mendoza	10	10	10	4.3%	4.3%	10.4	10.9	11.1	-0.4	-0.9	-1.1	-0.47	-0.22
Misiones	6	7	7	2.2%	2.4%	5.3	5.6	6.2	0.7	1.4	0.8	0.76	-0.66
Neuquen	4	5	5	1.0%	1.2%	2.3	2.4	3.1	1.7	2.6	1.9	0.90	-0.65
Rio Negro	5	5	5	1.4%	1.6%	3.5	3.6	4.0	1.5	1.4	1.0	-0.16	-0.39
Salta	7	7	7	2.4%	2.7%	5.9	6.2	6.8	1.1	0.8	0.2	-0.27	-0.61
San Juan	6	6	6	1.7%	1.6%	4.0	4.2	4.2	2.0	1.8	1.8	-0.18	0.04
San Luis	4	5	5	0.8%	0.9%	1.9	2.0	2.3	2.1	3.0	2.7	0.91	-0.23
Santa Cruz	4	5	5	0.4%	0.5%	1.0	1.1	1.3	3.0	3.9	3.7	0.95	-0.16
Santa Fe	19	19	19	8.8%	8.6%	21.3	22.3	22.1	-2.3	-3.3	-3.1	-0.96	0.20
Santiago del Estero	7	7	7	2.1%	2.1%	5.1	5.4	5.3	1.9	1.6	1.7	-0.23	0.07
Tierra del Fuego	2	2	5	0.1%	0.2%	0.3	0.3	0.5	1.7	1.7	4.5	-0.01	2.78
Tucuman	9	9	9	3.5%	3.5%	8.5	8.9	9.0	0.5	0.1	0.0	-0.38	-0.14
	243	254	257			243	254	257				0	0

Notes: This Table shows the steps taken to get "Aggravated Malapportionment", the instrument for "FTSA per capita". Allocated Seats is the official distribution of seats per province, considering the addition of eleven seats in 1983, and then accounting for 1991 modifications (three more seats for Tierra del Fuego). For our Population Share columns, for 1983 we have used an estimation based on the population growth between Census 1980 and 1991, and for 1991 simply the Census 1991 information. Proportional number of seats distributes according to population shares; 1983 share for (d) and (e), and 1991 share for (f). The columns labelled as "Malapportionment" contrast the proportional distribution of seats with actual allocation. Finally, "Aggravated Malapportionment" compares how this difference was altered both in 1983 and in 1991.

Table 1.9: Malapportionment and Federal Transfers, Reduced Form

Dep. Var.: FTSA per capita	Entire Period: 1984-2014			Sub-period: 1984-1988		
	(1)	(2)	(3)	(4)	(5)	(6)
Aggravated Malapportionment	0.368^{+++}	0.364^{+++}	0.147^{+++}	0.379^{+++}	0.404^{+++}	0.437^{+++}
	(0.0705)	(0.0650)	(0.0399)	(0.0760)	(0.0532)	(0.0511)
GGP per capita (Logs)		-0.0156	0.208		-0.420^{++}	-0.595^{+++}
		(0.182)	(0.175)		(0.199)	(0.201)
Executive Constraints		-0.732	-0.367		0.128	0.0974
		(0.639)	(0.516)		(0.653)	(0.506)
Party Coincidence with President		-0.136^{++}	-0.101^{+}		-0.245^{+}	-0.203^{++}
		(0.0568)	(0.0545)		(0.140)	(0.0941)
Human Development Index (HDI) Ranking		0.0110	0.0102		-0.0126	-0.0220^{+}
		(0.0130)	(0.0103)		(0.0132)	(0.0133)
Constant	6.792^{+++}	7.321^{+++}	5.038^{+++}	6.880^{+++}	11.04^{+++}	12.84^{+++}
	(0.0542)	(1.851)	(1.868)	(0.0634)	(1.919)	(1.994)
Observations	291	259	259	102	101	101
R^2	0.265	0.334		0.318	0.429	
F (Kleibergen-Paap F-statistic)	27.28	31.37		24.90	57.64	
F_{Eff} (Montiel Olea-Pflueger F-statistic)	27.28	31.37		24.90	57.64	
Estimation Method	OLS	OLS	Random Effects	OLS	OLS	Random Effects

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table compares First Stage regressions using Aggravated Malapportionment to explain FTSA per capita. The table is divided into two. The first 3 models use OLS and Random Effects in the entire period over 1984-2014. The second column replicates these calculations for a sub-period between 1984 and 1988. Aggravated Malapportionment is positively correlated to FTSA per capita.

A relevant discussion involves the exogeneity of our instruments. While malapportionment is not necessarily exogenous, but the result of political forces at crucial historic moments (Ardanaz and Scartascini, 2013), the circumstances under which the "aggravation" of malapportionment occurred in Argentina are. Both the military alterations in 1983 and the creation of a new province in 1991 are events orthogonal to our main variables of interest. As discussed in Galiani et al. (2016), the 1983 changes were not related to fiscal or economic variables, but to the fact that the military government considered that the peronist's votes were concentrated in large metropolitan areas. By over-representing small provinces in Congress, the political power of this party would be diminished. Similarly, the creation of a new province in 1990 responded to the institutional development of the region. Even more, while the institutionalisation of Tierra del Fuego might result from a number of factors, the resulting increase in representation in Congress was a consequence of having low population which made 1983 military dispositions binding (a minimum of 5 seats per province).

Instrumenting endogenous variables with binary dependent outcomes demands certain precautions. Building on the previous sections, we use the linear probability model and the random effects estimator[31]. Unfortunately, we cannot any longer exploit fixed effect panel

[31]We also tried the non-linear probit. There are relatives advantages and disadvantages to each method (see for instance Lewbel et al. (2012)), but for simplicity, we only show LPM results. It is important to mention that findings are not affected if we use non-linear probit with instruments.

Table 1.10: Malapportionment and Federal Transfers. Structural Equation

Dependent Variable: Reformed Term Limits						
	Entire Period: 1984-2014			Sub-period: 1984-1988		
	(1)	(2)	(3)	(4)	(5)	(6)
FTSA per capita (Logs)	0.0246	0.0183	0.0183	0.0809	0.113^{++}	0.113^{++}
	(0.0534)	(0.0617)	(0.0617)	(0.0638)	(0.0524)	(0.0524)
GGP per capita (Logs)		0.0339	0.0339		0.00779	0.00779
		(0.0350)	(0.0350)		(0.0790)	(0.0790)
Executive Constraints		-0.629^{+}	-0.629^{++}		-0.299	-0.299
		(0.313)	(0.313)		(0.591)	(0.591)
Party Coincidence with President		0.0235	0.0235		0.0611	0.0611
		(0.0303)	(0.0303)		(0.0428)	(0.0428)
Human Development Index (HDI) Ranking		0.00352	0.00352		-0.00203	-0.00203
		(0.00263)	(0.00263)		(0.00600)	(0.00600)
Constant	-0.0977	-0.0524	-0.0524	-0.489	-0.599	-0.599
	(0.363)	(0.608)	(0.608)	(0.436)	(0.973)	(0.973)
Estimation Method	IV-2SLS	IV-2SLS	Panel RE IV-2SLS	IV-2SLS	IV-2SLS	Panel RE IV-2SLS
Observations	291	259	259	102	101	101
R^2	0.015	0.036		0.042	0.065	
Instrumented = FTSA per capita (Logs)						
Instrument = Aggravated Malapportionment						

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table displays the Reduced From when instrumenting federal transfers using Aggravated Malapportionment. This Table is divided into two, one for entire period over 1984-2014, and the other for a sub-period between 1984 and 1988. We use IV-2SLS and Panel Random Effects IV-2SLS with and without covariates. The positive effect is observed across all specifications, although significance appears in the sub-period between 1984 and 1988.

structure of the data as a consequence of having a time-invariant instrument in the period of interest (1984-1988). For that reason, we use either the LPM or the Random Effects specifications in Table 1.9. Our First Stage regressions seem to show that there exists a correlation between "Aggravated Malapportionment" and FTSA per capita[32]. Moreover, the first-stage fit is strong: both the Kleibergen-Paap F-statistic and the Montiel Olea-Pflueger F-statistic are greater than critical values for respective tests. This result is robust to a number of different specifications and data splits, mainly between the period that concern us, 1984-1988, and over 1984-2014. (Porto and Sanguinetti, 2001) also discuss this strong relationship between representation in Congress and level of federal transfers in Argentina.

The most interesting finding in Table 1.10 is that when we restrict the analysis to the period that concern us (1984-1988), the instrument does indeed do a good job. Especially when covariates are considered. When instrumented, results point out to a positive correlation between FTSA per capita and Reformed Term Limits. Over the entire period, we would expect the instrument to be less relevant. As argued before, after 1988 federal funds has been exogenously channelled to provinces.

[32]Due to multicollinearity we necessarily drop from our specifications our variable "Adjusted Malapportionment" used in previous sections.

1.4 Conclusions

This study has argued that fiscal resource abundance can have unplanned consequences. In particular, we linked Federal Tax-sharing Agreement (FTSA) imbalances to the probability of reforming Argentinian provincial constitutions. Using the institutional shock in 1983 and the particularity that re-elections were banned across jurisdictions, we provided some evidence that the distribution of funds was consistently related to the probability of reforming.

In the theoretical build up, we developed a model to make term limits endogenous. This simple model captures the interactions between institutional factors and exogenous sources of revenue. We described two possible equilibriums; the "Restrained Incumbent" case where there is rotation in power, and the "Political Confrontation" equilibrium, where the incumbent will try to affect turnover probability. This last scenario depends on the value of retaining office, net from the cost of engaging in such confrontation. We therefore identified a decreasing relationship with local levels of salaries, or economic development, and an increasing pressure to relax term limits from higher levels of "unearned" revenues, proxied by federal transfers. This simple model set out the groundwork for our empirical work.

The evidence seems to be in concordance with the theoretical propositions. Guided by the model, we first built a new dataset on economic, political and institutional variables for 22 provinces. We identified 28 episodes of constitutional reforms affecting term limits in 20 jurisdictions. Next, we laid some initial findings using survival analysis. This econometric method allowed us to exploit variations both in FTSA and in the timing of reforms. We then moved to a LPM model, which facilitated the control of institutional factors. Lastly, we suggested causality between FTSA and term limits by instrumenting federal transfers. For that purpose we used the aggravation of over representation of some provinces in National Congress. While the evidence regarding economic development in the province is mixed, our most interesting result points to a significant correlation between FTSA and the likelihood of constitutional reforms.

The intricacies and repercussions of federal fiscal arrangements are necessarily subtle. The "invisible" workings of fiscal federal structures remains a promising area for research, especially if we are to comprehend the roots of political and institutional stagnation in developing countries. For instance, by constitutional mandate in the national reform of 1994, Argentina should have passed a new law establishing new distribution of federal transfers before 1996. Nowadays, more than 20 years past that deadline, the law has not been sanctioned yet. Any serious discussion affecting the status-quo can be blocked by winners of the 1988 FTSA. Taken together, this highlights some unexpected consequences; sloppy designed tax-sharing agreements can be powerful enough to impose deadlocks even to constitutional mandates.

This paper adds to the growing number of articles that deal with collateral consequences of fiscal arrangements. In Argentina, the democratic transition in 1983 gave some provinces (governors) a strong negotiating hand. While we have explored one of its conse-

quences, the facilitation of politically demanding term limits reforms, a number of other democratic institutions could have been affected. Argentinian provinces, as many other institutions in developing countries, exhibit a very strong provincial executive branch. These rentier governors would not have been there if term limits had not been relaxed.

Chapter 2

Resource Windfalls and Tax Salience. Evidence from Local Governments in Argentina

Abstract

This paper assesses the impact of windfall-like federal funds in the tax structure of municipalities in Argentina. I build a career concerns theoretical model with three sources of revenue with different level of visibility. Local incumbents can exploit tax opacity to disguise themselves as able administrators. In this scenario, an equilibrium is discussed where local mayors reduce direct and accountable taxes after an unexpected increase in funding. To give empirical support to this proposition, a newly collected panel is used consisting of 428 local governments in Argentina (distributed in 23 provinces) over 2006-2017. To isolate exogenous variation in funding, I exploit the creation by presidential decree of the Federal Solidarity Fund, *Fondo Federal Solidario* (FFS), in March 2009, which was channelled to provinces using fixed two-decades-old coefficients set in the Federal Tax-sharing Agreement (FTSA -Law 23,548 in 1988). Using event case difference-in-differences, I compare winners and losers resulting from its disproportional design. Some evidence is presented that the increase in funding has permitted those municipalities in winner jurisdictions to alleviate revenue pressures for their constituencies, and the preferred channel has been to reduce direct taxation. Weak tax-benefit linkages can have pervasive effects on accountability that local mayors can potentially exploit.

2.1 Introduction

The "perils of unearned income" (Smith, 2008) have long since puzzled scholars and international donors alike. In the seventies, a nascent literature emerged on the consequences of freely collected revenues, such as aid or natural resource rents, on growth, but it quickly grew to more complex issues like democratic institutions and rule of law (for comprehensive reviews see Ploeg (2011); Ross (2015)). In this study, the effect of windfall-like federal transfers on the tax structure of municipalities in Argentina is analysed. Subnational governments in developing countries normally face severe limits when trying to collect revenues. In the aftermath of a resource bonanza, is a municipality's ability to collect revenues undermined? After receiving extra funding, do local mayors substitute revenues by reducing direct taxes, thus exploiting an opaquer tax structure?

How federal transfers are spent by local governments has been widely scrutinised in the literature. The immense research on the flypaper effect observes the differential impact on public spending when it is financed by transfers (for a comprehensive survey see Inman (2008)). One possible explanation of the flypaper effect resides in the interaction between institutional constraints and incentives faced by incumbents. A related body of research has argued that given a preferred allocation of public goods, the extra influx of funds may be used to reduce local taxes and fees (Mahdavy, 1970; Ross, 2001). However, these discussions have been centred around the allocation of extra-revenues between local public goods and local taxes, or a combination of both. In this chapter we focus on the simultaneous selection of tax instruments and public goods, after extra resources are poured into local governments.

This paper makes two contributions. First, drawing on Bracco et al. (2018), we develop a simple model to capture the interaction between resource revenues and tax instrument selection. We account for the behaviour of an office-minded incumbent who collects three sources of revenues; two taxes and federal transfers. These revenues differ in their visibility. Regarding taxes, while one tax instrument is fully observed, the other is only partially internalised by voters. We are thinking in terms of two widely used taxes or contributions in local governments in Argentina, the property tax and the business tax. The latter is plausibly less salient. In order to get re-elected, the local mayor in this framework can disguise her ability by exploiting the lack of visibility of both federal transfers and the less-salient tax. We develop two propositions. First, non-salient tax bases will be exploited more intensively. This is a consequence of political advantages from using opaque tax structures. Second, after an unexpected increase in federal transfers, the incumbent will reduce both taxes, but the substitution will be more pronounced for the most visible tax. Forces operating in this scenario are similar to the previous case, by switching from visible sources, voters' ignorance of the mayor's ability can be exploited.

The theoretical model is inspired by the growing literature related to tax salience. Given that governments have available a set of taxes with different levels of visibility, voters would systematically underestimate government budgets. Previous studies have focused on electoral competition gains resulting from exploiting different tax bases (Bracco et al.,

2018; Bordignon et al., 2017). But local taxes are just one portion of municipal revenues. Federal transfers are the building block of local budgets. In Argentinian municipalities, federal and provincial grants represent nearly 48% of total revenues (Lopez Accotto et al., 2016). In spite of their preponderant relevance, federal transfers have not been analysed in their theoretical settings. We add to this literature by studying the interaction between taxes and exogenous federal funding.

The second contribution is testing the main implications of this model in Argentinian municipalities. We work with a newly collected panel of 428 local governments over 2006-2017. One key addition is the disaggregation of subcomponents of own source municipal revenues (OSRs). Crucial for our theory, Contributions on Property and Contribution on Businesses are identified. To the best of our knowledge, there is no such comprehensive compilation of data for municipal governments in Argentina. For instance, in the work by Lopez Accotto et al. (2016), data is compiled for 277 local governments in 2013. In this chapter we not only increase the number of units, but also build a panel structure.

Several studies illustrate the complexity of finding a good quasi-experimental design with plausible exogenous variation in the influx of federal funds (for an insightful discussion on endogeneity issues, see Dahlberg et al. (2008)). This paper exploits a naturally conceived experiment in Argentina. In March 2009, the Federal Government created by presidential decree the "Federal Solidarity Fund - FFS (by its Spanish acronym)". Formed by 30% of soy export tariffs, this funding was channelled to provinces, and then to municipalities, using fixed two-decades-old arbitrary coefficients in the Federal Tax-sharing Agreement (FTSA). Using difference-in-differences, we compare winners and losers resulting from its disproportional design. We provide some causal estimates of the impact of the FFS on tax effort and tax selection. For those municipalities that received a disproportional inflow of funds after 2009, results suggest there was a reduction between 3.38% and 5.01% percentage points in contributions that fall on property for a 10% deviation in our measure of windfall intensity. Being partially compensated by an increase in easy-to-collect indirect taxes, there was no significant effect on total own source revenues.

There is a recent strand of literature that explores misuses of federal transfers. Caselli and Michaels (2013) argue that there was little improvement in public good quality spending, or in living standards, when Brazilian municipalities experienced exogenous increases in revenues from higher oil prices. Rather than boosting spending on productivity-enhancing public goods, "extra" funds were spent on embezzlement, self-enrichment and vote buying. Similarly, for the municipal context in Brazil, Gadenne (2017) discusses the differential impact of tax revenues and transfers. While the former improved quantity and quality of municipal education infrastructure, the later had no impact on public good provision. In the same institutional setting but following a different empirical strategy, Brollo et al. (2013) find evidence that a positive variation of 10 per cent in federal transfers raised local corruption by 16 per cent and increased the probability of re-election by 7% in municipalities in Brazil. According to Ferraz and Monteiro (2014), municipal-level oil windfalls in Brazil helped incumbents remain in power. Litschig and Morrison (2013) show that re-election probability improved by about ten percentage points in 1988 elections for those

local governments who received extra funds for being just over the population threshold. We contribute to this literature by adding a more subtle and indirect channel by which tax selection results biased towards opaque tax sources after the influx of funds.

This chapter relates to the literature on vertical fiscal imbalances in developing countries. There is some evidence that these imbalances are more pronounced in non-OECD countries (Besfamille and Lockwood, 2007). This mismatch between expenditures and revenues can be exploited by local authorities by exporting taxation (or receiving federal transfers)(Inman, 2003). An interesting point is raised by Krane et al. (2004). If local service demand increases subnational governments may attempt to "(a) transfer the costs upward, (b) export the costs, (c) seek revenues from superior levels of government, or (d) adopt (or seek permission to adopt) less visible sources". Argentina shows a large provincial vertical fiscal imbalance (Artana et al. (2012), Tommasi et al. (2001), Ardanaz et al. (2014)), but due to empirical limitations, very little research has been done for the municipal level. In this chapter we acknowledge the relevance of this mismatch between taxes and expenditures in local municipalities, but we explore the forces behind a relaxation of certain tax pressures. Moreover, we closely look at the interaction between local taxes and federal transfers. This behaviour can have pervasive repercussions on tax-benefit linkages and accountability; fiscally independent governments can act as rentier states, taxing very little to their constituencies and extracting the benefits of public spending.

This chapter is organised as follows. In Section 2.2, a principal-agent model with career concerns is carefully studied. Next, in Section 2.3 the empirical strategy is set out; this section includes a detailed explanation on the institutional setting, the identification strategy and the baseline findings. Finally, Section 2.4 provides the conclusions.

2.2 Theoretical Model

In this section we closely follow Bracco et al. (2018) in modelling tax salience. The structure of the model is principal-agent with career concerns as studied by Persson and Tabellini (2000). The main contribution is that an exogenous source of revenue is added in the form of federal transfers. In the face of a newly greater budget, we explore the consequences on a selected set of tax instruments. An office-minded incumbent will reduce both types of taxes after the increase in transfers, but the most salient tax will experience grater reductions.

An elected mayor rules in a representative municipality. There are two periods $t = 1, 2$, and the incumbent allocates the local budget into public good provision G_t using the following production function;

$$G_t = (\tau_{1t} + \tau_{2t} + F_t) \exp(a_t) \tag{2.1}$$

Municipal revenues depend on two tax instruments, tax on property and tax on business (τ_{1t} and τ_{2t}), an exogenous source of revenue in the form of federal transfers F_t, and the ability of the incumbent, a_t. We assume ability is a random but permanent feature of the incumbent. At the end of the first period, voters can re-elect the incumbent with an estimated known ability, a_1^e, or vote for an opposition' candidate with unknown ability but drawn from the same distribution, with mean zero..

We make two realistic assumptions regarding tax instruments. First, while property tax (τ_1) is completely observed, we assume that τ_2, tax on business, is partially rationalised[1]. Voters are only aware of the salient part of the tax, a proportion s ($0 \leq s \leq 1$). The second assumption is that voters only observe v ($0 \leq v \leq 1$) amount of exogenous transfers (F) received by the mayor. In the context of fiscal federalism, with multiple layers of government, this is a plausible assumption for Argentinian municipalities. Federal governments can use a number of different instruments to make local citizens aware of federal funded projects. These assumptions create a systematic error in forecasting mayor's ability that she will try to exploit.

During the first period, nature draws ability of the incumbent a^M, and given the level of transfers F_1 and tax policy (τ_{11}, τ_{21}), G_1 is determined by equation (2.1). Using the level of public spending, voters try to calculate the mayor's ability and they compare it to the expected ability of a challenger. The incumbent is re-elected if her observed ability is greater than that of the challenger. In the second period, the winner selects a new tax policy (τ_{12}, τ_{22}), and G_2 is provided.

The incumbent in office exploits this apparent contradiction in being fully aware of public good consumption and rationally bounded in terms of tax policy. Bracco et al. (2018) offer a possible explanation in terms of "cognitive bias". The cost of calculating the actual amount of the less-salient tax makes them unwilling to invest resources on it.

[1]This is simplification for algebraic purposes. It can easily be extended to both taxes being non-fully observable. The only assumption needed is that tax on property would be more visible than business tax.

This is particularly important for tax on business. While property tax is directly paid by households on a monthly basis, in municipalities in Argentina, taxes on businesses are mostly formed by a variation of turnover tax, or sales tax. This tax cascades and it is rolled into the price of products (Section 2.3.1 provides a more detailed explanation of the particularities of these two taxes in the context of Argentinian municipalities).

Voter's Utility: There is a large number (a continuum of mass 1) of identical voters. The representative voter maximises the following utility:

$$u(G_t, c_t) = w(G_t) + c_t^i - X_i \tag{2.2}$$

The utility from public good consumption $w(G_t)$ is monotonically increasing and concave. Ideological preferences captured by X_i are uniformly distributed over $[\eta - \frac{1}{2\zeta}, \eta + \frac{1}{2\zeta}]$. ζ is a measure of the dispersion of ideological preferences. η captures the possibility of a popularity shock, for convenience uniformly distributed as well over the interval$[-\frac{1}{2\xi}, \frac{1}{2\xi}]$. This popularity shock has a mean of 0, and a density of ξ.

Assuming exogenous income y, private consumption is given by,

$$c_t^i = y - \tau_{1t} - \tau_{2t} - \frac{1}{2}\tau_{1t}^2 - \frac{1}{2}\tau_{2t}^2$$

On top of the income loss from taxes (τ_{1t} and τ_{2t}), we add two convex cost functions, $\frac{1}{2}\tau_{1t}^2$ and $\frac{1}{2}\tau_{2t}^2$, to model distortions associated with the administrative burden of tax collection.

Quasi-benevolent Mayor: The incumbent is concerned with voter's welfare, weighted by λ ($0 < \lambda \leq 1$), but also values office V_{it}.

$$\max_{\tau_{1t}, \tau_{2t}} \quad U^M = \lambda(w(G_t) + y - \tau_{1t} - \tau_{2t} - \frac{1}{2}\tau_{1t}^2 - \frac{1}{2}\tau_{2t}^2) + \gamma_{it} V_{it} \tag{2.3}$$

Without loss of generality, we take $V_{it} = 1$ and we solve the problem backwards. γ_{it} is the probability of re-election. The incumbent will try to exploit the visibility of tax instrument to affect the likelihood of retaining office. For simplicity, we will use an explicit utility from public good consumption in the form natural logs;

$$w(G_t) = ln(G_t) = ln(\tau_{1t} + \tau_{2t} + F_t) + a_t \tag{2.4}$$

Second Period: In this period there is not re-election incentive, $\gamma_{it} = 0$. Therefore, the incumbent in office selects τ_{1t}, τ_{2t} to maximise (2.3). The first order conditions are given by;

$$\begin{aligned} \frac{\partial U^M}{\partial \tau_{12}} &= \frac{1}{(\tau_{12} + \tau_{22} + F_2)} - 1 - \tau_{12} = \quad 0 \\ \frac{\partial U^M}{\partial \tau_{22}} &= \frac{1}{(\tau_{12} + \tau_{22} + F_2)} - 1 - \tau_{22} = \quad 0 \end{aligned} \tag{2.5}$$

The tax strategy in period two does not depend on ability. However, mayor's ability positively affects voter's utility. Combining (2.1) and (2.3), ability of incumbent increases public good provision;

$$\frac{\partial U^M}{\partial a_2} = \lambda \frac{\partial w(G_t)}{\partial a_t} = \lambda > 0 \tag{2.6}$$

Given the structure of the model, the decision of voters is simple; They will always re-elect above-average incumbents. During the first period, an estimation of mayor's ability will be obtained based on observed G_1. Then, considering political preferences, and full knowledge of the uniform distribution of abilities, the voters will select second period incumbent. The mayor in office is fully aware of this voting decision and will try to exploit the salience of different tax instruments to portrait herself as competent.

$$\tilde{\gamma}_i = \begin{cases} 1 & \text{if } a^e \geq X_i \\ 0, & \text{otherwise} \end{cases}$$

Her probability of re-election then is given by $\text{Prob}[\tilde{\gamma}_i = 1] = \text{Prob}[a^e \geq X_i]$[2]. Given the uniform distribution of η, the probability for the incumbent of winning γ_i is,

$$\gamma_i = \frac{1}{2} + \xi a^e \tag{2.7}$$

The estimated ability a^e is inferred by voters in period one. For that purpose, they use $w(G_1)$ which is affected by the biased estimate of the municipal budget. Considering a log form, this estimation comes from the following expression;

$$w(G_1) = ln(G_1) = ln(\tau_{11} + \tau_{21}^e + F_1^e) + a^e \tag{2.8}$$

The estimation error comes from the lack of salience of both the business tax (τ_{21}^e) and federal transfers (F_1^e). This is a persistent error because voters consistently link their imperfect estimations to what they can observe. Thus, for business tax voters only incorporate the salient part ($\tau_{21}^e = s\,\tau_{21}$), and for transfers ($F_1^e = v\,F_1$). This causes that some portion of the budget is incorrectly imputed to a^e. The actual utility from public good corresponds to;

$$w(G_1) = ln(G_1) = ln(\tau_{11} + \tau_{21} + F_1) + a_1 \tag{2.9}$$

[2]A voter will compare $a^e - X_i \geq 0$, the estimated utility from the ability of current incumbent, corrected by ideological preferences, with the expected utility of a challenger $E(U_2(a)) = 0$. Using the uniform distribution of X_i, the shares of votes is given by

$$V = \frac{1}{2} + \zeta[a^e - \eta]$$

The incumbent will need more than $\frac{1}{2}$ of votes if he is to remain in office $\frac{1}{2} + \zeta[a^e - \eta] \geq \frac{1}{2}$ or $a^e \geq \eta$. By uniform distribution of η, with mean zero and density ξ we get,

$$\gamma_i = \frac{1}{2} + \xi a^e$$

Therefore, combining (2.9) and (2.8), the part attributed to the ability of the incumbent for public good consumption in first period is;

$$a^e = ln(\tau_{11} + \tau_{21} + F_1) - ln(\tau_{11} + s\tau_{21} + vF_1) + a_1 \tag{2.10}$$

This is more clearly observed in the partial effect of the tax instruments on perceived ability;

$$\begin{aligned}
\frac{\partial a^e}{\partial \tau_{11}} &= \frac{1}{(\tau_{11} + \tau_{21} + F_1)} - \frac{1}{(\tau_{11} + s\tau_{21} + vF_1)} < 0 \\
\frac{\partial a^e}{\partial \tau_{21}} &= \frac{1}{(\tau_{11} + \tau_{21} + F_1)} - \frac{s}{(\tau_{11} + s\tau_{21} + vF_1)} \\
\frac{\partial a^e}{\partial F_1} &= \frac{1}{(\tau_{11} + \tau_{21} + F_1)} - \frac{v}{(\tau_{11} + s\tau_{21} + vF_1)}
\end{aligned} \tag{2.11}$$

While increases in τ_{11} reduce the mayor's estimated ability, changes in both τ_{21} and F_1 have uncertain effects. This is due to the concavity of $ln()$ and $0 < s, v < 1$.

First Period: Given that we are in period 1, we drop the time subscripts. The Mayor in office will maximise:

$$\begin{aligned}
\max_{\tau_1, \tau_2} \quad & U^M = \lambda\Big(w(G) + y - \tau_1 - \tau_2 - \frac{1}{2}\tau_1^2 - \frac{1}{2}\tau_2^2\Big) + \frac{1}{2} + \xi a^e \\
s.t. \quad & w(G) = ln(G) = ln(\tau_1 + \tau_2 + F) + a \\
& a^e = ln(\tau_1 + \tau_2 + F) - ln(\tau_1 + s\tau_2 + vF) + a \\
& \tau_1 \geq 0 \\
& \tau_2 \geq 0
\end{aligned} \tag{2.12}$$

Using subscript to represent partial derivative, the FOC for τ_1 is:

$$\begin{aligned}
U^M_{\tau_1} = \frac{\partial U^M}{\partial \tau_1} &= \lambda\Big[\frac{1}{(\tau_1 + \tau_2 + F)} - 1 - \tau_1)\Big] + \xi\Big[\frac{1}{(\tau_1 + \tau_2 + F)} - \frac{1}{(\tau_1 + s\,\tau_2 + v\,F)}\Big] \\
&= \frac{(\lambda + \xi)}{(\tau_1 + \tau_2 + F)} - \frac{\xi}{(\tau_1 + s\,\tau_2 + v\,F)} - \lambda - \lambda\tau_1 = 0
\end{aligned} \tag{2.13}$$

Similarly, the FOC for τ_2 is given by;

$$\begin{aligned}
U^M_{\tau_2} = \frac{\partial U^M}{\partial \tau_2} &= \lambda\Big[\frac{1}{(\tau_1 + \tau_2 + F)} - 1 - \tau_2\Big] + \xi\Big[\frac{1}{(\tau_1 + \tau_2 + F)} - \frac{s}{(\tau_1 + s\,\tau_2 + v\,F)}\Big] \\
&= \frac{(\lambda + \xi)}{(\tau_1 + \tau_2 + F)} - \frac{\xi s}{(\tau_1 + s\,\tau_2 + v\,F)} - \lambda - \lambda\tau_2 = 0
\end{aligned} \tag{2.14}$$

These two FOC are different from those in second period (Equation (2.5)). The difference arises from the fact that setting τ_1 and τ_2 also involves the probability of winning the

election. This probability is affected by voters incorrectly attributing some public good consumption to mayor's ability.

Setting (2.13) equal to (2.14), we obtain,

$$(\tau_2^* - \tau_1^*) = \frac{\xi(1-s)}{\lambda(\tau_1^* + s\tau_2^* + vF)} \tag{2.15}$$

From this expression we obtain the main propositions,

Proposition 1: *When one tax instrument is not fully observed by voters, ($s < 1$), the less-salient tax (τ_2^*) will be set to a higher level than the fully observed tax τ_1^*.*

Proof Proposition 1: This result derives directly from Equation (2.15). Given that $\xi, \lambda > 0$ the RHS will be always positive for $s < 1$.

During the first period, the mayor in office will exploit voter's incorrect estimation of her ability, weighted against the marginal costs of raising both taxes. The key driver of this result is ($s < 1$), as equal visibility of both taxes will equalise tax levels. The next proposition explore further consequences of having less salient taxes.

Proposition 2: *For tax salience s in the interval $(s^*, 1]$, an increase in federal transfers F, will widen the gap between both tax instruments $(\tau_2^* - \tau_1^*)$.*

Proof Proposition 2: As a first step, assume that both tax instruments are fully observable such as $s = 1$. In that case, we have by Equation (2.15) that $\tau_1^* = \tau_2^* = \tau$. Subsequently, for cases where $s < 1$, differentiating the tax gap Equation (2.15) with respect to s, we obtain the inverse relationship (to facilitate notation we take $\tau_i = \tau_i^*$ for $i = 1, 2$, the optimised taxes),

$$\frac{d(\tau_2 - \tau_1)}{ds} = -\frac{\xi(\tau_1 + \tau_2 + vF)}{\lambda(\tau_1 + s\tau_2 + vF)^2} < 0 \tag{2.16}$$

The gap between taxes increases as a consequence of reductions in tax salience. For that to be possible, τ_1 has to fall at a greater pace than τ_2.

The next step is to totally differentiate (2.15) to get the partial effect of F on each tax base,

$$\frac{\Big[(\tau_2 - \tau_1) - (\tau_1 + s\tau_2 + vF)\Big]}{v(\tau_2 - \tau_1)}\frac{d\tau_1}{dF} + \frac{\Big[s(\tau_2 - \tau_1) + (\tau_1 + s\tau_2 + vF)\Big]}{v(\tau_2 - \tau_1)}\frac{d\tau_2}{dF} = -1 \tag{2.17}$$

Rearranging, and setting;

$$\begin{aligned} A &= -\frac{v(\tau_2 - \tau_1)}{(\tau_2 - \tau_1) - (\tau_1 + s\tau_2 + vF)} \\ B &= -\frac{s(\tau_2 - \tau_1) + (\tau_1 + s\tau_2 + vF)}{(\tau_2 - \tau_1) - (\tau_1 + s\tau_2 + vF)} \end{aligned}$$

We obtain the following expression for the combined effect of federal transfers.

$$\frac{d\tau_1}{dF} = A + B\,\frac{d\tau_2}{dF}, \quad \begin{cases} A, B > 0 & \text{if} \quad (\tau_2 - \tau_1) < (\tau_1 + s\tau_2 + vF) \\ \text{Undefined} & \text{if} \quad (\tau_2 - \tau_1) = (\tau_1 + s\tau_2 + vF) \\ A, B < 0 & \text{otherwise} \end{cases} \tag{2.18}$$

Therefore, in the vicinity of $s = 1$, by the continuity of the FOCs in s, there is an s^* such as that $(\tau_2 - \tau_1) < (\tau_1 + s^*\tau_2 + vF)$ and $A, B > 0$. Furthermore, given that $B > 1$, $|\frac{d\tau_1}{dF}| > |\frac{d\tau_2}{dF}|$.

The intuition of this result is as follows. An increase in F affects both the current utility for public good consumption and the probability of re-election, through unobserved imputed ability ($\frac{\partial a^e}{\partial F_1}$). Why would the incumbent reduce taxes? After all, by doing this she would be counterbalancing both of these mentioned effects. The reduction in taxes is due to the fact that for a given level of public goods G, the extra funding from F allows the incumbent to alleviate deadweight losses from taxes.

The mayor faces an option between two tax bases to reduce. By Equation (2.15), the level of tax salience s governs this decision. While one tax still generates a trade-off in terms of re-election probabilities, the fully accounted tax does not. It necessarily implies that the less salient tax will be used more intensively. This generates a tax gap. However, deadweight losses impose a limit on this gap. Within the interval where these administrative costs are not binding, more specifically, when both taxes are similarly used, the incumbent will reduce both taxes but the reduction will be more pronounced for the fully visible tax. This will be the case when s is close to one.

2.3 Empirical Strategy

2.3.1 Institutional Framework. Municipal Revenues in Argentina

Argentina is a federal country with three overlapping tiers of government: Federal, Provincial (24) and Municipal (2284). Provinces should guarantee local autonomy, but in some jurisdictions, it has not been fully delegated yet[3]. When there is autonomy, local governments are permitted to dictate their own constitution (*Municipal Charters*), otherwise they are bound by Provincial Law (*Ley Orgánica*).

There is wide heterogeneity in fiscal municipal structure. Table 2.1 shows the municipal budget composition aggregated at the provincial level. Current revenues represent an average on 89.3% of total revenues, almost entirely explained by the combined collection of Own Source Revenues (OSRs) and Provincial/Federal Transfers (25.6% and 54.6% respectively). When other current revenues are important, it is because municipalities receive funding from royalties. On the other side of the balance sheet, municipalities spend most of their budget in Current Expenditures, nearly 76.2% of Total Expenditures where 47.8% is Personnel Expenses, that is salaries and public wages. Nonetheless, Capital Expenditures are also an important destiny of municipal funds, reaching 23.8% of Total Expenditures.

Own source municipal revenues (OSRs) derive from a constellation of contributions and taxes. Two tax bases stand out and are broadly used; property and businesses. Both tributes are collected in different ways, partially because they overlap with provincial and even with federal tributes[4]. For those municipalities where property tax has not been fully decentralised, "Contributions on Property" are formed by a charge for services related to lighting, street cleaning, waste management, and other similar services; sometimes labelled as a levy on real state (*Tasa General de Inmuebles*). Across municipalities, this tax receives different names; such as General Services or Council Fees, Lighting and Cleaning Fees (*Alumbrado, Barrido y Limpieza*). The tax base also varies across municipalities, but it is ultimately always associated with the property value. According to (López Accotto et al., 2015), 77% of municipalities use either the "fiscal" value property, taken as a proportion of market value, or area-based assessment in general expressed as lineal front meters of the property, or a combination of both. Sometimes, the charge is related to the location of the property within the city. Highest rates apply for properties near the city centre and the rate decreases in relation to some sort of zonification (concentric rings in some cases).

[3]Municipalities should be autonomous jurisdictions, following the mandate in Art.123 of the reformed constitution in 1994. Institutional, bureaucratic or administrative capabilities has not been decentralised in municipalities in the provinces of Buenos Aires, City of Bs Aires, Mendoza, La Pampa and Santa Fe.

[4]Property is taxed by the three tiers of government; first as a variation of wealth tax (*Bienes Personales*) by the federal level, then as a property tax by provinces (sometimes urban areas are delegated to local governments and rural areas remain provincial tax base), and finally by municipal governments either as property tax or as a contribution. Similar considerations apply for contributions on business as it closely shares the tax base with VAT (Federal) and with Turnover Tax (Provincial).

Table 2.1: Aggregated Municipal Budget Composition at the Provincial Level

Province	Total Revenues										Total Expenditures			
	General Composition		Disaggregation of Current Revenues			Disaggregation of Own Source Revenues					General Composition		Disaggregation of Current Expenditures	
	Current Revenues	Other Revenues	Own Source Revenues (OSRs)	Provincial & Federal Transfers	Other Curr. Revenues	Contrib. on Property	Contrib. on Business (Health & Safety Tax)	Property Tax	Turnover Tax	Other Mun. Revenues	Current Expenditures	Capital Expenditures	Personnel	Other C. Spending
Buenos Aires	89.7%	10.3%	32.3%	49.0%	8.4%	7.3%	4.8%			20.2%	84.2%	15.8%	47.9%	36.3%
Catamarca	99.0%	1.0%	15.2%	74.8%	9.0%	2.6%	8.2%			4.5%	82.8%	17.2%		
Chaco	92.2%	7.8%	27.8%	58.1%	6.4%	1.9%	3.2%	2.0%		20.6%	76.6%	23.4%		
Chubut	75.2%	24.8%	20.1%	17.3%	37.7%	3.9%	6.2%	3.0%	4.7%	2.4%	65.7%	34.3%		
Cordoba	85.5%	14.5%	47.2%	28.6%	9.6%	8.3%	13.5%			25.5%	75.9%	24.1%	34.9%	40.9%
Corrientes	86.1%	13.9%	23.3%	60.9%	1.9%	3.2%	0.7%	3.8%		15.5%	75.3%	24.7%		
Entre Rios	93.8%	6.2%	25.4%	59.5%	8.9%	3.0%	20.0%			2.4%	80.4%	19.6%	44.8%	35.6%
Formosa	100.0%	0.0%	17.2%	82.5%	0.3%						71.4%	28.6%		
Jujuy	81.9%	18.1%	13.0%	64.6%	4.3%	3.2%	1.2%			8.6%	80.3%	19.7%	55.7%	24.6%
La Pampa	83.3%	16.7%	34.4%	43.3%	5.7%	7.2%	0.5%			26.7%	95.2%	4.8%	54.7%	40.4%
La Rioja	96.5%	3.5%	20.1%	71.4%	5.0%						72.1%	27.9%		
Mendoza	97.8%	2.2%	16.1%	68.0%	13.7%	5.6%	2.6%			7.8%	84.7%	15.3%		
Misiones	99.1%	0.9%	49.9%	48.0%	1.3%	6.9%	29.3%			13.6%	76.1%	23.9%		
Neuquen	66.8%	33.2%	13.0%	46.6%	7.2%	3.4%	4.1%			5.5%	81.6%	18.4%	54.2%	27.4%
Rio Negro	91.4%	8.6%	29.5%	51.7%	10.2%	8.0%	5.9%			15.6%	75.2%	24.8%	54.7%	20.6%
Salta	90.7%	9.3%	17.4%	53.9%	19.5%	4.1%	7.3%	2.1%		3.9%	74.4%	25.6%	43.4%	31.0%
San Juan	97.4%	2.6%	25.8%	57.9%	13.7%	9.1%	3.4%			13.4%	76.9%	23.1%	41.2%	35.8%
San Luis	83.3%	16.7%	25.7%	55.1%	2.5%	3.1%	3.2%			19.4%	56.6%	43.4%	30.9%	25.7%
Santa Cruz	67.0%	33.0%	16.4%	26.4%	24.1%		0.9%	1.5%		14.0%	65.9%	34.1%	57.6%	8.3%
Santa Fe	94.1%	5.9%	44.7%	43.5%	5.9%	10.7%	15.4%			18.6%	78.5%	21.5%	50.0%	28.5%
Santiago del Estero	97.8%	2.2%	10.5%	85.3%	2.0%						68.5%	31.5%		
Tierra del Fuego	95.3%	4.7%	19.2%	71.0%	5.1%	2.2%	0.8%	3.0%		13.2%	82.0%	18.0%	52.7%	29.3%
Tucuman	90.7%	9.3%	44.2%	39.0%	7.4%	5.9%	28.6%			9.7%	72.5%	27.5%	45.9%	26.6%
Total	89.3%	10.7%	25.6%	54.6%	9.1%						76.2%	23.8%	47.8%	29.4%

Source: Collected Data Set.

Notes: This Table contains municipal fiscal data aggregated at the provincial level in percentage to total revenues and total expenditures. *Current Revenues* sums up receipts classified by the nature of fund flows. *Other Revenues* are originated in capital sales (assets for instance) and other receipts. *Own Source Revenues* collects a number of different contributions, licences, permits, user fees, and taxes. *Provincial and Federal Transfers* consolidate grants from the provincial and the federal government and *Other Current Revenues* includes funding from royalties among others. *Contributions on Property* comprehend rates for public services for lighting and street cleaning, some municipalities charge it as one single concept (ABL (*Alumbrado, Barrido y Limpieza*)) and other governments differentiate it in different user fees. *Contributions on Business - Health and Safety Tax* is a fee applied to business sales, it resembles a turnover tax. *Property tax* is applied by some jurisdictions. Municipalities in Chubut also apply *Turnover tax*. Licences, permits and other user fees are included in *Other Municipal Revenues*. The last four columns are calculated as a proportion of total expenditures. *Total Expenditures* are divided into *Current Expenditures* and when possible, I also include *Personnel Expenditures*.

Table 2.2: Tax Base Comparisons

Province	City Tax Code	Tax Base			
		Contributions on Property	Property Tax	Contributions on Businesses	Turnover Tax
Chaco	Resistencia	Fixed minimum based on property location plus percentage rate property value.	Property value		
Chubut	Rawson	Property front meters, type of street and use (industry, business, etc.).	Property value	Fixed minimum based on building area (sq. metres) and activity plus turnover	Turnover
Corrientes	Corrientes	Property front meters and use (industry, business, etc).	Property value		
Formosa	Formosa	Property area (squared meters), type, location and use (industry, business, etc).	Property value		
Salta	Salta	Property value	Property value		
Santa Cruz	Caleta Olivia	Property value	Property value		
Tierra del Fuego	Ushuaia	Property front meters, location, category and improvements.	Property value		

Source: Selected Municipal Tax Codes.
Notes: This Table compares city tax codes of municipalities in provinces where tax collection has been decentralised. In cases where municipalities can collect Property Tax, the tax base definition has been contrasted with that of Contributions on Properties. Chubut has also decentralised Turnover Tax to municipalities. In this case, this tax is compared with Contributions on Businesses.

Local governments also apply local business tax. In what we have labelled "Contributions on businesses", we include the so-called *Charge for Health and Safety Inspections*. This charge is generated by services related to security, health and safety in local industries and businesses. Although the tax base varies across municipalities, it is typically applied as a local tax on gross receipts. Less universally, some local governments also consider the number of employees, squares metres, localization, some sort of fixed amount of sales, or a combination of the previous. Following López Accotto et al. (2015), 75% of local governments use turnover as tax base.

The theoretical model distinguishes between direct and indirect taxation, and these two taxes are used as proxies. In addition to the previous mentioned contributions, some municipalities apply Property and Turnover Tax. For instance, in Table 2.2 we can observe that Property tax has been decentralised in 7 provinces. A close examination to local tax codes shows that both, Contributions and Property Tax use valuation of the property as tax base. Ranging from the exact same tax base, such as in Salta (Salta) or Caleta Olivia (Santa Cruz), to indirectly capturing the value by combining property location, front metres, area, type and use. In the province of Chubut, turnover tax has also been decentralised. In this case, there is also a clash of similar tax bases with Contributions on Business. Both taxes are rooted in the turnover, with minor rates for contributions and a fixed minimum based on building area.

2.3.2 Data

The database covers an unbalanced panel of 428 local governments in Argentina (distributed in 23 provinces) over 2006-2017. It contains information on 14 fiscal variables covering municipal own source revenues (OSRs), federal and provincial transfers, and government expenditure. Table 2.3 presents the summary statistics. A detailed explanation

Table 2.3: Municipal Fiscal Data, Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Own-source Municipal Revenues pc	3,179	321.5	237.9	5.4	2,501.2
Municipal Contributions on Property pc	2,286	60.5	87.9	0.0	1,316.1
Municipal Contributions on Business pc	1,547	52.5	70.3	0.0	622.9
Municipal Tax on Property pc	357	50.2	60.7	0.0	502.1
Municipal Turnover Tax pc	278	78.7	81.3	0.0	479.0
Automatic Transfers pc	3,703	726.3	536.6	0.0	3,721.2
FFS Transfers pc	2,669	50.7	43.7	0.8	432.9
Royalties pc	820	303.0	366.6	0.0	2,046.5
Discretionary Transfers pc	2,279	131.1	226.2	0.0	3,858.3
Personnel Expenses pc	2,413	706.2	627.5	76.5	6,270.4
Current Revenues pc	3,128	1,243.5	721.2	0.0	6,072.4
Current Expenditures pc	2,193	1,243.6	947.1	154.2	8,684.1
Total Revenues pc	3,251	1,686.4	2,922.6	208.7	106,862.2
Total Expenditure pc	3,576	1,651.4	2,790.7	192.9	106,862.2
Municipal Population	4,221	69,980.2	162,865.5	50	1,775,816

Note: This Table displays summary statistics for the main variables of interest. Constant values are in Argentinian pesos in 2007 ($1 ARS peso=U$S 0.3203).

of data sources can be found on Appendix B.1.

As mentioned in the previous section, there is wide heterogeneity in municipal budgets. The first clear pattern is that municipalities rely heavily on provincial and federal transfers (*Automatic Transfers pc*). OSRs are second order when it comes to sources of revenues. The second observation is that Contributions on Property and on Business are similar in size to FFS transfers, so we can potentially observe substitution effect for these sources of revenues. It is worth mentioning that the relatively small number of observations for Tax on Property, Turnover Tax and Royalties are due to the fact that these taxes are not widespread. Moreover, Turnover Tax is only collected at the municipal level in the province of Chubut. Royalties are also limited to a small number of provinces. When present in municipal budgets, they constitute a relevant source of revenue.

Table 2.4 provides an aggregated overview of the data set. According to the 2010 National Census of Population, Households, and Housing (INDEC), there were 2284 local governments in the country distributed in 23 provinces, plus the Autonomous City of Buenos Aires. In terms of coverage, the 428 units in the sample account for 77% of total country population. The bulk of information is grouped around 2009, the year where the Federal Solidarity Fund (FFS) was implemented. This is the result of having made every effort to have pre and post FFS creation data, in order to have fiscal variation in the panel structure. The sample continues up to 2017.

Table 2.4: Collected Data Set

						Panel Data Distribution												
Province	***Population 2010***	***Local Governments***$^{+}$	***Local Governments in Sample***	***Population Covered***	***% Population Covered***	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Buenos Aires	15,625,084	135	135	15,625,084	100%			134	134	134	134	134	135	135	135	40	54	59
Catamarca	367,828	36	1	159,703	43%		1	1	1	1	1	1	1	1	1	1	1	
Chaco	1,055,259	68	2	322,310	31%			2	2	2	2	2	2	2	2	2	2	1
Chubut	509,108	47*	27	496,389	98%		25	26	26	27	27	27	27	26	25	25	24	22
Cordoba	3,308,876	427*	19	2,030,851	61%		2	9	10	10	10	11	11	11	10	13	13	17
Corrientes	992,595	72*	3	479,993	48%		2	2	2	2	3	3	3	3	3	2	2	3
Entre Rios	1,235,994	274*	78	1,145,353	93%			76	76	77	77	78	78	78	78	78	78	78
Formosa	530,162	55*	2	275,724	52%				1	1	2		1					
Jujuy	673,307	60	3	368,199	55%		2	1	1	1	1	1			1	1	2	1
La Pampa	318,951	80	3	173,044	54%			2	3	3	3	2	2	3	2	2	2	2
La Rioja	333,642	18	1	180,995	54%		1			1							1	1
Mendoza	1,738,929	18	18	1,738,929	100%		9	9	11	16	16	16	15	12	13	13	13	13
Misiones	1,101,593	75	3	407,607	37%			1	2	2	2	2	2		3	2	3	3
Neuquen	551,266	57*	37	532,220	97%		32	33	32	26	30	25	16	2	31	25	30	2
Rio Negro	638,645	76	5	372,095	58%		1	3	5	5	5	5	4	5	5	4	5	4
Salta	1,214,441	60	15	828,120	68%		1	12	7	3	12	6	8	2	2	1	1	1
San Juan	681,055	19	3	276,653	41%				1	1	2	2	1	2	2	1	1	1
San Luis	432,310	68*	49	305,849	71%			27	35	2	45	47	44	40	47	41	38	35
Santa Cruz	273,964	27*	3	168,418	61%				1		2	2	2	1	1			1
Santa Fe	3,194,537	363	16	1,929,259	60%	1	7	10	14	12	13	13	13	13	10	11	10	13
Santiago del Estero	874,006	117*	2	359,859	41%				1	2	2	1	1	1	1	1	1	1
Tierra del Fuego	127,205	5*	2	123,068	97%			1	2	2	2	2	2	2	2	1	1	1
Tucuman	1,448,188	112*	1	548,866	38%				1	1	1					1	1	
Sub-total	**37,226,945**	**2,269**	**428**	**28,848,588**	**77%**	**1**	**83**	**349**	**368**	**331**	**392**	**380**	**368**	**339**	**374**	**265**	**283**	**259**
City of Buenos Aires	2,890,151	15																
Total	**40,117,096**	**2,284**																

Source: $^{+}$ National Institute of Statistics and Censuses (INDEC, in its Spanish acronym) 2016, National Census of Population, Households, and Housing 2010, and Collected Data Set. * Areas classified as rural zones, disputed zones (in Corrientes), and Ranquel Country (in San Luis), are not included in the number of local governments, but their population is distributed in the corresponding province. Rural zones are defined as areas of population less than 2,000 and on "open country", combined they sum up 470,909 habitants.

Notes: This Table shows a general overview of the collected dataset. In the first part of the Table, the number of municipalities in sample is contrasted to the total, including percentage of population covered. In the second part, a distribution per province and year is detailed.

In Appendix B.1, we use sample control to check how closely the dataset resembles the population of local governments in the country. We contrast the distribution of three groups of variables, potentially associated with municipal tax collection, between the sample and the entire set of municipalities. These variables contain information on human capital, property and basic services at the municipal level. We find that discrepancies between both datasets are reduced when we consider local governments greater than 10,000 habitants.

Lastly, one of the key contributions of this newly collected database is that it covers the principal subcomponents of own source municipal revenues (OSRs); Contributions on Property and Contribution on Businesses. Collapsing this data also posed some challenges mainly because of registration issues. What we call Contributions on Property receives a number of different labels across municipalities, sometimes as one single concept or separated into sub-concepts. As discussed earlier, to a certain extent, all these classifications use some variation of the value of the property as a base for the tax. Similarly, Contributions on Businesses is in effect a local tax on gross receipts. A local turnover tax, with different tax rates per activity. In order to make these bases comparable, local legal dispositions have been scrutinised to check for similarity across tax bases definitions.

2.3.3 Winners and Losers of FTSA 23,548

The empirical strategy exploits the particular way the Federal Solidarity Fund (FFS) was distributed to provinces. According to the presidential decree, these funds were going to be apportioned using coefficient-shares pre-established in the Federal Tax-sharing Agreement (FTSA), Law 23,548. The system generates enormous asymmetries. For instance, in per capita terms in 2009, Tierra del Fuego received 6.5 times more than Buenos Aires and 11.8 times compared to the City of Buenos Aires.

The root of these disparities lies in the fact that provincial shares are not defined by formula in the FTSA. They are fixed and the result of political negotiations between 1985-1987 that ended up with the sanction of *"transitory"* Law 23,548 in 1988. Meant to last for only one year, this not-so-transitory Law has survived for more than 30 years. An effective deadlock was imposed[5]. This generates an FTSA system that is perceived as a close-end, unconditional, lump-sum grant (Besfamille et al., 2017). There is no bargaining in Congress for these resources and, given that it is not defined by objective indicators, there is no incentive to affect institutional or economic variables to get more funding. A number of political and incentive problems can be traced back to the disproportional influx of FTSA funds some provinces receive (for instance, Gervasoni (2010)).

From the contrast between what constitutes an "optimal" distribution and actual coefficients we can obtain winners and losers of the current regime. A number of studies have attempted to establish what would be an appropriate distribution of federal funds

[5]The Reform requires the approval of both federal chambers and each provincial Legislature. The deadlock has been so successful in preventing structural modifications to secondary distribution, that even though by Constitutional mandate in 1994 a new regime should have been passed no later than 1996, actual coefficients are still based on Law 23,548.

in compliance with the Constitution[6] (for a survey, see Piffano (2004)[7]). However, these preferences are strongly influenced by institutional and political factors. To account for this, we use the last legislation related to FTSA; the Law 20,221 in 1973[8]. In this law, the secondary distribution is based in three factors: 25% by development gap (using Human Development Index -HDI), 10% by demographic dispersion, and 65% by population. A very relevant point is that these coefficients were the starting point for the above-mentioned negotiations between 1985-1987, hence they reflect direct winners and losers from the current system.

By comparing these two laws we obtain our *"Windfall Intensity"*(W_k) variable, where the sub-index k reflects provincial variation. In Table 2.5, we contrast coefficients in Law 20,221 with those used to distribute FFS funds in 2009. Thus, *"Windfall Intensity"* is a correction factor, a ratio between both coefficients. Those provinces with a windfall intensity less than one lost in negotiations, and otherwise. W_k takes the form;

$$\text{Windfall Intensity} = W_k = \frac{\text{Coefficients Law 20,221}}{\text{Coefficients Law 23,548}} \quad \text{for} \quad k = 1, ..., 24$$

Two points stand out from Table 2.5. The first one is that most provinces managed to keep similar coefficients in 1988, as WI is compressed around one. The second issue is that Buenos Aires is the greatest loser from the actual regime. Buenos Aires received 21% less of what it would have obtained if Law 20,221 were still in use. At the expense of this jurisdiction, smaller provinces ended up in a much better situation after 1988. The case of Tierra del Fuego is exemplary. This province received 0.4% of federal funds in 1973, and that proportion had escalated to 1.2% in 2009, a threefold increase[9].

As a second stage, once provinces received the FFS funds, they were required to redistribute "at least" 30% to municipalities. In the diagram in Figure 2.1, an overview is displayed on the flow of funds reaching fictional Municipality "A". As a first step, 30% of FFS were distributed to provinces using coefficients in Federal Law 23,548 (1988). This is where the exogenous disproportional influx of funds is generated for the reasons mentioned before. In the second step, at least 30% of funds received by the provinces

[6]In the Constitutional reform in 1994 it was established that federal transfers should be *"equitable, committed to solidarity and will prioritize the achievement of an equivalent degree of development, quality of life and equal opportunities."* (Article 75, subsection 2).

[7]In general, most of these proposals put an important weight on Population, either directly or indirectly. There is also agreement on the use of development indexes to address inequalities across jurisdictions, such as Human Development Index (HDI) or the Unsatisfied Basic Needs Index (UBN). It is also acknowledged the necessity of encouraging provincial fiscal effort and therefore the importance of including a measure of own-source revenues or expenditure allocation (see Annex B.2 for a comparison for three selected proposals).

[8]This Law was passed by the military government but ratified and extended for ten years by democratic Congress (Porto, 2004).

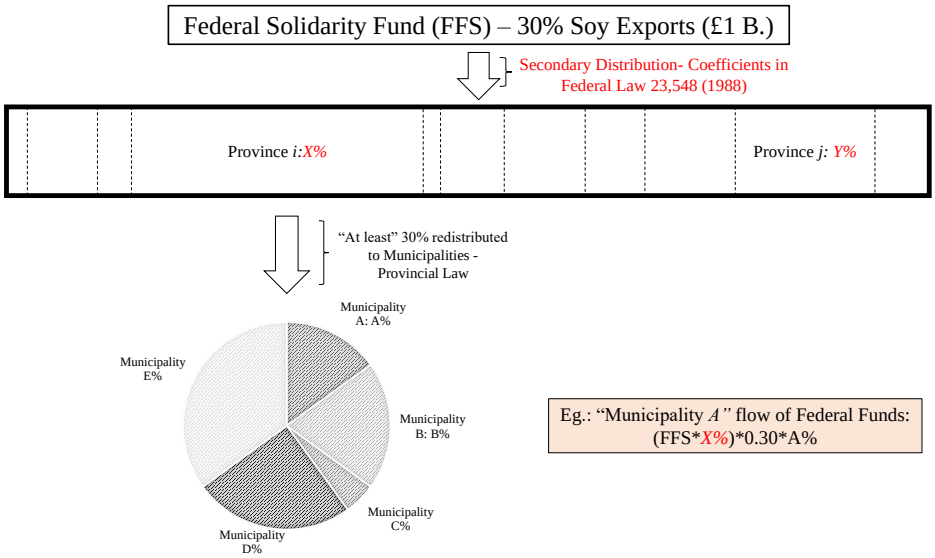
[9]Both Laws, 20,221 and 23,548, are redacted in somewhat an intricate way when it comes to the distribution of funds to the City of Buenos Aires (municipality at that moment), and Tierra del Fuego. In Law 20,221 it is established that the City of Buenos Aires and Tierra del Fuego would get 1.8% and 0.2% of the portion accrued to the Federal Government. On the contrary, in Law 23,548, 0.7% of total collected funds would go to Tierra del Fuego and 1.4% to the City of Buenos Aires. For the sake of comparison, coefficients have been normalised to 1 in Table 2.5.

Table 2.5: Deviations from the Optimal

Province	Coefficients		Deviations	
	Distribution FFS (A)	Law 20,221 (B)	Law 20,221	Windfall Intensity =(A)/(B)
Buenos Aires	0.212	0.269	-21.08%	0.789
Catamarca	0.027	0.019	43.74%	1.437
Chaco	0.048	0.040	21.58%	1.216
Chubut	0.015	0.018	-14.93%	0.851
Cordoba	0.086	0.085	0.38%	1.004
Corrientes	0.036	0.036	-1.22%	0.988
Entre Rios	0.047	0.044	7.60%	1.076
Formosa	0.035	0.022	59.97%	1.600
Jujuy	0.027	0.021	29.44%	1.294
La Pampa	0.018	0.017	4.91%	1.049
La Rioja	0.020	0.017	20.87%	1.209
Mendoza	0.040	0.045	-11.27%	0.887
Misiones	0.032	0.028	12.21%	1.122
Neuquen	0.017	0.016	1.61%	1.016
Rio Negro	0.024	0.022	10.36%	1.104
Salta	0.037	0.036	2.87%	1.029
San Juan	0.033	0.025	33.13%	1.331
San Luis	0.022	0.017	30.89%	1.309
Santa Cruz	0.015	0.014	10.60%	1.106
Santa Fe	0.086	0.087	-0.76%	0.992
Santiago del Estero	0.040	0.039	3.56%	1.036
Tierra del Fuego	0.012	0.004	200.79%	3.008
Tucuman	0.046	0.044	5.12%	1.051
City of Buenos Aires (CABA)	0.024	0.036	-33.34%	0.667
Total Provinces + CABA	1	1		

Note: Two distributions of federal funds are displayed in this Table, FFS apportionment based on FTSA Law 23,548, and Law 20,221. The coefficients in Law 20,221 from 1973 were formed in 25% by development gap (Development Human Index), 10% by demographic dispersion, and 65% by population. In the last column, Windfall Intensity variable is calculated

Figure 2.1: Distribution of FFS Scheme Presidential Decree 206/2009



Note: This Figure shows the two stages that take the FFS to reach Municipality "A". The differential impact is created in the first stage, where funds are apportioned to provinces using the coefficients in FTSA 23,548. Then, provinces redistribute "at least" 30% to municipalities. In this second stage, provincial laws were normally used.

was redistributed to municipalities using local Laws. A relevant point here is to prove that there were no negotiations between provinces and municipalities for these funds, as it would weaken the point of exogeneity being originated in the initial redistribution. In the next subsection, provincial handling of these funds is closely analysed.

2.3.3.1 Description of FFS Distribution per Province

The empirical strategy relies on the disproportional influx of funds resulting from using FTSA to apportion funds to provinces. Given that provinces further decentralised FFS to municipalities, it is important to rule out any involvement of municipalities in this decision. Table 2.6 shows a detailed account of the legal instrument used by provinces to adhere (and to receive) FFS transfers and the form of distribution to municipalities. Nearly 80% of provinces used a provincial Decree. This portrays a picture of an agile and expedite legal process only involving the executive branch. Laws, on the other hand, require negotiation in the legislature where municipalities might have some influence. Nonetheless, when Laws were used, they were dictated before the end of March, also in super-fast negotiations.

As a result, apportionment to municipalities rarely differs from already cemented Laws of provincial distribution of funds or "Coparticipations". Two types of deviations are found. First, local governments in some jurisdictions received more than 30% of FFS (Chubut 32.8%, Neuquen 30.8% and Salta 50%). Second, some provinces established new coefficients of distribution of funds. In Neuquen, 29.199% of funds were distributed using

Table 2.6: FFS Apportionment to Local Governments

Province	Legal Instrument	Date	Apportionment to Municipalities*	Distribution %
Buenos Aires	Decree 440	01/04/2009	Law 10559 (1988) - Coparticipation	30%
Catamarca	Decree 280	27/03/2009	Law 5174 (2005) - Coparticipation	30%
Chaco	Decree 535	20/03/2009	Law 3188 (1986) - Coparticipation	30%
Chubut	Law II 109	31/03/2009	Law II 6 (1974) - Coparticipation	32.80%
Cordoba	Decree 369	01/04/2009	Law 8663 (1998) - Coparticipation	30%
Corrientes	Decree 399	19/03/2009	Law 5152 (1996) - Coparticipation	30%
Entre Rios	Decree 758	26/03/2009	Law 8492 (1991) - Coparticipation	30%
Formosa	Law 1532	26/03/2009	Law 766 (1998) - Coparticipation	30%
Jujuy	Decree 2861	27/03/2009	Proportion "similar" to Provincial Coparticipation - Law 5329 (2002)	30%
La Pampa	Law 2477	26/03/2009	Law 1065 (1988) and Law 2460 (2008) - Coparticipation	30%
La Rioja	Decree 357	25/03/2009	Established new coefficients in the Law, but they resemble those in Decree 757 (1982) - Coparticipation	30%
Mendoza	Law 8028	26/03/2009	Law 6396 (1996) - Coparticipation	30%
Misiones	Decree 292	26/03/2009	Law 2535 (1988) - Coparticipation	30%
Neuquen	Decree 739	31/03/2009	29,199% according to Provincial Law 2148 (1993) - Coparticipation; 1,602% following new coefficients established in the Decree	30.80%
Rio Negro	Decree 82	24/03/2009	Law 1946 (1985) - Coparticipation	30%
Salta	Decree 1368	25/03/2009	30% according to Decree 798 (1978) - Coparticipation; 20% according to new coefficients established in the present Decree	50%
San Juan	Law 7972	23/03/2009	Law 7947 (2008) "Provincial Budget"	30%
San Luis	Decree 418	01/04/2009	Law 5537 (2004) - Coparticipation	30%
Santa Cruz	Decree 517	01/04/2009	Law 1494 (1982) - Coparticipation	30%
Santa Fe	Decree 486	31/03/2009	Law 7457 (1975) - Coparticipation	30%
Santiago del Estero	Decree 198	26/03/2009	Law 6426 (1998) - Coparticipation	30%
Tierra del Fuego	Decree 636	27/03/2009	Law 191 (1983) - Coparticipation	30%
Tucuman	Decree 14/3	23/03/2009	Law 6316 (1991) - Coparticipation	30%

Notes: This Table details the legal instrument, the date, and the percentage used by provinces to redistribute FFS to municipalities. Most provinces followed previous laws, but some cases sanctioned new legal instruments.

Law 2,148 (1993), and an additional 1.602% was used to create a "Compensatory Fund" to be distributed among 8 municipalities (out of 57). Similarly, Salta distributed 30% using pre-dated Coparticipation Law, and the additional 20% following new coefficients[10].

This would pose a particular challenge to the empirical strategy. Either by receiving a bigger share of FFS funds or by getting extra funding caused by coefficient modification, some municipalities are directly receiving more transfers as a result of the provincial decree, not only as a consequence of the application of Federal Tax Share Agreement. It is possible that these negotiations might confound the channel of FFS effect. The most straightforward way of dealing with this is by excluding these municipalities from our working sample. As it will be shown in the following sections, this improves results but

[10]Although La Rioja and San Juan set new coefficients, these procedures were standard. In La Rioja, there is no Law regulating distribution of provincial funds. The criteria followed for FFS resembled that of Decree 757, dated 1982. In a similar case, in the absence of a provincial Law, San Juan distributed FFS funds according to 2009 Budget, sanctioned in 2008. (for a detailed explanation of provincial laws for transfer of funds to municipalities see Díaz Frers (2013)

does not affect main conclusions.

2.3.4 Main Findings

In this section, the differential impact of federal transfers on municipal revenues is examined. The identification strategy relies on the exogenous effect of FFS generated by apportioning funds using the FTSA agreements. We apply event case difference-in-differences analysis for winners and losers of the current FTSA scheme, the source of exogenous treatment. Following Borusyak and Jaravel (2017), we estimate the following model:

$$T_{ikt} = \alpha_0 + \alpha_1(W_k * POST_t) + \alpha Z_{it} + \mu_i + v_t + \varepsilon_{ikt} \tag{2.19}$$

Where i stands for municipality, located in province k at year t. $T_{ikt} = (\frac{T}{P})_{ikt}$ is the dependent variable in per capita logs, and involves different sources of municipal revenues. W_k "Windfall Intensity" in logs, combines exogenous deviations in FTSA coefficients as in Table 2.5 at the provincial level, it is our continuous policy variable[11] $POST_t$ is the "treatment" variable, the application of the FFS fund, which takes one for all jurisdictions after 2009 and zero otherwise. Z_{it} is a vector of covariates such as log of GGP per capita and Automatic Transfers per capita (in logs), one of the main sources or revenues for Municipalities. Jurisdiction (μ_i) and time fixed effects (v_t) are included. The years under analysis cover 2006-2015 period. In December 2015, the Federal Government started a process of shrinking FFS resources, triggered by a gradual reduction in the export duty rate, followed by an altogether elimination in 2018. All standard errors are clustered at the municipal level.

As explained before, we are interested in the effect FFS had on municipalities that disproportionally benefited from its creation. The term $W_k * POST_t$ captures that interaction. Two important aspects are worth mentioning for our baseline results. First, for the sake of getting an intuitive insight regarding substitution or complementarity of tax bases, I use municipalities with complete revenue data. Given that there were different degrees of accessibility of data, the database contains more observations for Total Revenues, than for OSRs or for Contributions on Property. In order to account for that, I use municipalities with complete data on composition of revenues. In the robustness section I drop this restriction and show that the main results are unaffected by this. Secondly, in the baseline regressions we omit small towns of less than 10,000 habitants. There are both theoretical and empirical grounds to do so. Theoretically, the framework portraits a model where the incumbent "hides" behind less visible tax sources. For small municipalities this no longer holds, as the local mayor is presumably well known for all. Additionally, transparency for small municipalities is very weak. By including them I would possibly be uncovering some other effects related to different institutional designs. On empirical grounds, during the data collection stage, I only intensively searched for municipalities greater than 10,000. This does not mean that there are no small towns in the sample though. The minimum town size with available fiscal data is 50 people (see Table 2.3). In

[11] We express W_k in logs to facilitate interpretation of coefficients.

the robustness section B.4, we relax these two restrictions by using the entire unbalanced dataset and by including 5,000 and 0 population thresholds. Main results are unaffected.

The baseline set of results are displayed in Table 2.7. Equation (2.19) is estimated for four different sources of municipal revenues. While Panel A is run without covariates, in Panel B the same regression includes Log of Automatic Transfers per capita and Provincial Gross Geographic Product per capita. The first row of the table recovers $\hat{\alpha}_1$, the behaviour after 2009 product of differential windfall intensity. The coefficients -0.338 and -0.501 for the column of Log Contributions on Property per capita indicate that after removing mean municipal and common year effects, there is a fall between 3.38% and 5.01% percentage points in this revenue source for a 10% increase in windfall intensity after 2009. In the same direction, Total Revenues experienced a reduction of 1.37%, but this effect vanishes when covariates are included. These finding suggest that there actually was a substitution of revenues after 2009, where the extra FFS funding was used to alleviate Property contributions, and with no effect on Own-source municipal collections.

Table 2.7: Impact of 2009 Windfall on Municipal Revenues, 2006 - 2015

Panel A: No Control Covariates				
	(1) Log Own-source Revenues pc	(2) Log Contributions on Property pc	(3) Log Contributions on Business pc	(4) Log Total Revenues pc
Windfall Intensity (logs) × POST	0.0947	-0.338^{+++}	-0.144	-0.137^{++}
	(0.0852)	(0.126)	(0.241)	(0.0600)
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1516	1500	1314	1394
Number of municipal clusters	209	212	194	208
Panel B: Control Covariates				
	(5) Log Own-source Revenues pc	(6) Log Contributions on Property pc	(7) Log Contributions on Business pc	(8) Log Total Revenues pc
Windfall Intensity (logs) × POST	0.135	-0.501^{++}	-0.137	-0.0603
	(0.106)	(0.237)	(0.255)	(0.0598)
Log Provincial GGP pc	-0.203	0.772	0.150	-0.350^{+}
	(0.237)	(0.771)	(0.592)	(0.181)
Log Automatic Transfers pc	0.0427	-0.0340	0.140	0.516^{+++}
	(0.0900)	(0.210)	(0.307)	(0.0809)
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1447	1432	1265	1339
Number of municipal clusters	207	209	191	206

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table presents our baseline calculations of Model (2.19) for different municipal revenues, without covariates in Panel A, and including provincial GGP and automatics transfers in Panel B. Municipal and year fixed effects are included.

In terms of the behaviour of municipal revenues, it is interesting to analyse the initial impact and subsequent adaptation to the windfall. For that purpose, in Figure 2.2 we re-estimate Equation 2.19 with covariates, and sequentially expand the period of study. In Plot 2.2a the interaction term ($W_k * POST_t$) on Contributions on Property for year 2009 (α_1) only includes observations over the period 2006-2009. For 2010, I run Equation 2.19 adding one extra year of observations (that is 2006-2010)[12]. For a more visual perspective, I also include 95% confidence intervals. While Contributions on Property seem to have shifted to a new permanent path of smaller revenues, Total Incomes show a sharp decline in 2009, followed by a three year recovery. As a consequence, over the period 2006-2015 there is no significant change. Both Contributions on Business and OSRs reveal a somewhat erratic pre-2009 behaviour, and no conclusive effect afterwards.

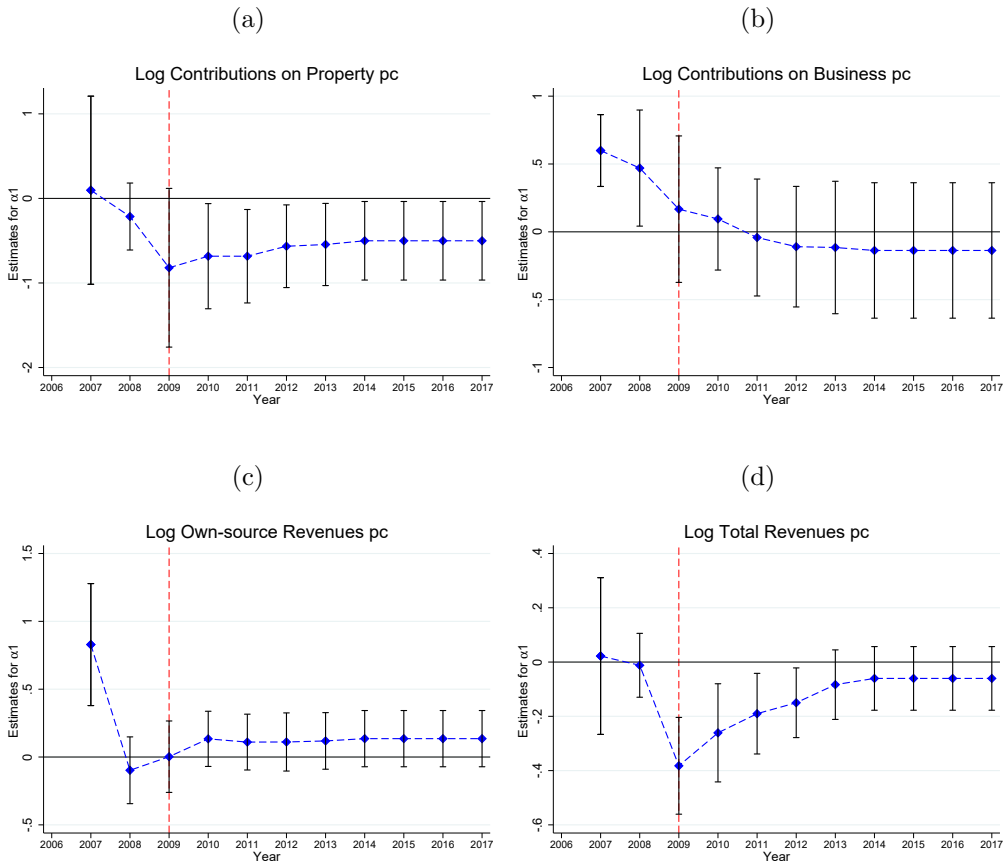
Recovering post intervention causal effects requires parallel trends and no anticipatory behaviour assumptions to be satisfied. Given the unexpected nature of the creation of FFS, the simultaneity and the form it was distributed, we can rule out any sort of anticipatory reaction. For the parallel trends' requirement, in the Appendix B.3, a combination of visual tools with the more rigorous lead and lags method are used. From this analysis it emerges that these assumptions hold. Lastly, in Appendix B.4 we try several different specifications to see how robust are these findings[13]. In these checks we do not observe any important alteration of results, thus evidence seems to corroborate the reduction of Contributions on Property after 2009.

Taken together, findings from this Section suggest that there was a significant change on municipal revenues after the influx of FFS funds, driven by the reduction of Contributions on Property. We connect this result to the theoretical model by noting that disproportional winners of current system reduced some visible and accountable tax bases, because they can rely on more obscure and less transparent fiscal revenues. Given that Contributions on Property tax collection demands stronger investments in fiscal capacity building, there can be long term effects from this substitution.

[12]For the period that goes from 2006 to 2008, the point estimate is given by simulating 2007 or 2008 as the first year under of the application of FFS. A similar analysis will be performed in the placebo test section.

[13]These alternatives include extending the data set to account for incompleteness by using an unbalanced panel, running placebo falsification test for years 2007 and 2008, expanding the sample to smaller municipalities (less than 10,000), controlling for provinces where the FFS was distributed following new patterns, including provincial fixed effects, restricting the sample to using only executed budget data, exploring the similarity of tax bases when municipalities could also apply Property Tax and Turnover Tax, changing our Windfall Intensity measure to per-capita influx of funds, and comparing those municipalities at the tails of the distribution (top 25% and bottom 25% in Windfall Intensity).

Figure 2.2: Post-windfall Revenue Behaviour : Selected Dependent Variables, Covariates



Note: These Figures portrait post-FFS adaptation for the four municipal revenues studied in this section. Each point estimate (and the 95% confidence intervals) uses Model (2.19) but sequentially expanding the period including that specified year.

2.4 Conclusions

The application of the FFS fund in 2009 seems to have permitted some municipalities in Argentina to exploit the benefits of unearned income. In this chapter we have argued that local governments that received disproportional inflow of funds have reduced municipal direct taxation. This can be potentially damaging for accountability at the subnational level as weak tax-benefit linkages can have pervasive effects and they can be difficult to revert.

Local mayors can exploit opaque tax structures in different ways. We have explored these options in the theoretical model. By building a career concerns model, where the local mayor can run for re-election, having three sources of revenues can give an edge in the electoral contest. The incumbent in our model exploits the lack of visibility in some tax instruments, in federal transfers, and in her unknown ability. One possibility is to base their local budget on less visible tax sources in such a way that some portion of public good consumption is confounded by voters and assigned to mayor's ability. The other possibility is to use extra budget due to transfers to relax taxing pressures. By doing this, the incumbent would be seen as an efficient administrator and capable politician, which increases the chances of re-election.

The empirical findings seem to support this behaviour in those municipalities located in provinces winners from the Federal Share Tax Agreement. By using a newly collected dataset of 428 local governments over 2006-2017, we explored the unexpected creation of Federal Solidarity Fund in 2009. The influx of funds to local governments was immense. In some cases, it matched the amount collected by principal components of own-source municipal revenues. The most important finding was that while total budget did not increase after FFS, these extra sources were used to reduce the visible Contributions on Property. These results were consistent and robust to a number of checks.

While Argentinian fiscal structure is special in many ways, the results of this chapter can be linked to the flourishing literature on effects of federal transfers in Brazil and other subnational governments. This literature points out to interesting directions for future research. It is natural to think about the political benefits of resource windfalls (re-election probabilities, candidate selection, and corruption).

The importance of strengthening local budget constraints has been highlighted in the literature (for instance in Bird (2011)). The increase in funding for local governments can wipe out some benefits of decentralisation if some perverse institutional features are caused by loose budgets and unaccountable politicians. It is the reinforcement of the pervasive effects that we have explored in this chapter by observing the tax structure change due to extra funds. The decrease in direct taxation that we observe for local governments in Argentina diminishes one channel by which citizens can effectively keep their politicians at bay.

Chapter 3

Inequality Shaping Institutional Design. Municipal Charters in Argentina

Abstract

This chapter explores the effect of socio-economic segregation on the probability of sanctioning Municipal Charters (MC) for municipalities in Argentina. Using Census data for years 2001 and 2010, we first develop municipal segregation measures for three variables; education levels, unsatisfied basic needs, and overcrowded households. We obtain the Gini Segregation Index (G) and the Information Theory Index (H) taking advantage of the disaggregation of municipalities in census tracts units. Subsequently, exploiting the timing of plausibly exogenous provincial constitutional reforms granting municipalities the right to adopt MC, we analyse the time to reform and the main factors driving this decision. The findings indicate a positive and consistent association between segregation indexes and the likelihood of adopting a charter; the more unequal distribution of socio-economic characteristics, the swifter the municipality will have its MC sanctioned.

3.1 Introduction

This chapter is concerned with the effect of local segregation on the likelihood of adopting Municipal Charters (MC) in Argentinian municipalities. Local Constitutions, or Municipal Charters, constitute one the most important pillars under which some democratic countries are organised. They define political institutions and reflect local preferences. Being an agreement on political choices, certain frictions on conflicting interests arise. Is segregation a driving force in shaping municipal charters? Do unequal cities prefer a more developed institutional landscape by having its own *"Carta Orgánica"*?

Previous studies have looked at factors explaining the sanction of municipal charters in the US (Maser, 1985, 1998; McDonald and Gabrini, 2014). Maser (1985, 1998) develops a theoretical model of "Constitutional Contracts" where alternative forms of governments are seen as competing investments. Given that these "relational contracts" create a system of rewards and penalties, each citizen will have a defined preference over these outcomes; Municipal charters will be an aggregation of individual preferences into social choices. Theoretically, local heterogeneity, or city income inequality, will be a factor influencing the adoption of specific constitutional rules; such as safeguards (for instance, recall provisions). Contributing to this literature, and using a similar method to our paper, McDonald and Gabrini (2014) estimate the probability of adopting a charter in 67 counties in the State of Florida. Their findings highlight the importance of economic factors, but inequality is not modelled. To date, the existing account of empirical evidence has been mixed regarding the impact of socio-economic characteristics, especially inequality, on this constitutional event. Furthermore, the literature on this topic has been disperse and centred in the US.

In this paper, we provide an assessment on whether segregation in education levels, poverty and unsatisfied basic needs is correlated to having MC in Argentina. Citizen's preferences over institutions translate into constitutional settings in intricate ways. Given the likely endogeneity of Constitutions to economic fundamentals, it is challenging to empirically answer such questions. In order to address that, I exploit differential time gaps (in years) between the plausibly exogenous recognition of municipal autonomy, granted by provincial constitutional reform, and the year when the municipality sanctioned its Municipal Charter. I proceed in three steps. First, I obtain measures of segregation at the subnational level using Census 2001 and Census 2010 data. Second, I study the process of sanctioning municipal charters across provinces. Nineteen out of twenty-four provinces allow their municipalities to sanction their MC, but nearly half of the eligible municipalities have adopted one (178 out of 409). It stands out that there are important provincial factors that drive municipal reforms, as 132 non-reformers (32%) are concentrated in provinces with 0 MC events[1]. Lastly, Cox proportional hazards model is used to analyse the effect of both the time to reform and the segregation levels in Argentinian municipalities.

The contributions of this study are twofold. First, this chapter adds to the new and growing literature that attempts to measure segregation in Argentina using Census data. A number of papers measure local socio-economic characteristics, but they are generally

[1] In Entre Rios, Formosa, La Rioja, Santa Cruz, and Tucuman.

case studies based in one city. In this chapter, segregation indexes are generated for more than 400 localities. Rodríguez (2019) is closely related to our work in developing measures of income affluence to a large number of municipalities, 789 cities, but his work is centred around correcting flaws of segregation measures for places with small number of census tracts. While his point is taken in our study, the institutional limits imposed by provinces to dictate MC, usually more than 10,000 habitants, leave us with medium to large cities. This means that we work with municipalities with large number of census tracts, averaging out, or at least alleviating, any bias in our measures. Moreover, a conformed panel structure naturally emerges from using Census tracts from 2001 and 2010 rounds. These segregation measures derive from three variables that capture socio-economic conditions; household head's education levels, unsatisfied basic needs, and overcrowded households.

The second contribution is to empirically analyse the connection between segregation and institutional change. To the best of my knowledge, for the very same empirical hurdles mentioned above, the correlations between MC sanctioning and economic segregation have not been explored for municipalities in Argentina. The timing of reform is a crucial element in our analysis. Resembling a survival framework, where a clock starts counting when provinces grant MC for the first time and stops at the time of reform, duration analysis and its rich empirical apparatus seem appropriate to explore these correlations. For the two calculated indexes, Gini Segregation Index (G) and Information Theory Index (H), I estimate the Cox proportional hazards model. The baseline results point out to an increase in the likelihood of sanctioning MC between 4.9% and 6.6% for a unit change in the Gini Segregation Index.

Municipal autonomy is for some subnational entities the culmination of hard-fought institutional decentralisation. There is an extensive body of research that deals with the pervasive effects of decentralisation on local accountability, corruption, clientelism and elite capture (for a survey see Mookherjee (2015); Mansuri and Rao (2012)). This literature is far from conclusive. An interesting point raised by Bardhan and Mookherjee (2000) highlights that elite capture at the local level seems difficult to predict vis a vis the centralised alternative. The authors build a model that considers electoral competition and local elites exercising lobby. It is the multiplicity of factors that affect the likelihood of capture (interest-group cohesiveness, voters' awareness, electoral competition and heterogeneity), that makes the final equilibrium hard to pin down. However, we are interested in the reverse channel; the connection that runs from socio-economic residential segregation, spatial and income inequalities, to institutional change.

This paper also relates to the research that explores the economic fundamentals behind democratic transitions and democratic consolidation. This literature is vast and varied, but the closest to our framework are the studies of Acemoglu and Robinson (2000, 2001, 2008), Acemoglu et al. (2007), Lagunoff (2009), and Ticchi and Vindigni (2010). This set of papers, both empirical and theoretical, give a preponderant role to economic conditions that facilitate endogenous institutional change. The conflicting role of polarisation, inequality and elite capture is particularly relevant. We add to this literature by exploiting the exogenous exposition of some municipalities to self-selection of a major constitutional

event, the sanctioning of MC, and the forces that play a role in this.

The remainder of the chapter is organized as follows. First, I start by reviewing the extensive scholarship on how inequality (and segregation) influences institutions. Second, using Census data for 2001 and 2010, I present newly developed measures of income segregation for municipalities in Argentina. Third, I use the Cox semi-parametric Survival Model to estimate the relationship between inequality and the probability of sanctioning municipal charters. Finally, I conclude.

3.2 Conceptual Framework

There are many reasons why municipal charters may be related to socio-economic segregation at the local level. In this section we explore four strands of literature. First, we present research related to the consequences of local segregation. Even though a diverse number of effects have been analysed, we find that institutional consequences have been overlooked. Second, we connect the endogenous institutional change literature and its main drivers. The body of research linking economic fundamentals with democratic processes is vast and robust, but its application to different menus of institutional reforms (subnational constitutions) is less spread. Third, this diverse scale of organisation in some countries is connected to the decentralisation literature. In this strand of research, the role of vested-interest groups and the likelihood of elite capture has been extensively analysed. Nonetheless, rather than exploring the effects of programs or countries when decentralising, we argued in favour of the other direction, going from local socio-economic characteristics to institutional settings. Finally, we explore the "Constitutional Contract Theory" that sees municipal charters as aggregation of local preferences. Not only this work is concentrated in one country, the US, but also we observe that empirical results are far from conclusive.

3.2.1 Local Segregation and Diverse Outcomes

Although a large body of literature focuses on outcomes related to residential segregation, very little research has been done on institutional consequences. A great deal of previous research is focused in the US, but has connected segregation with different outcomes such as racial sorting (Massey and Denton, 1988; Reardon and Bischoff, 2011; Reardon et al., 2008, 2015), social upward mobility (Chetty et al., 2018; Bergman et al., 2019) and even voting patterns (Williamson, 2008; Hersh and Nall, 2016). Reardon et al. (2015) finds that households with similar income but racial/ethnic differences are located in different neighbourhoods. For instance, middle class black households are generally located in poor areas. The political connection is relevant to our work on institutional change. Williamson (2008) explores the connection of local uses and characteristics, such as housing stock and car-oriented suburbs, and their association with conservative political outlooks in counties in the US. Similarly based in the US, Hersh and Nall (2016) connects partisanship in the local area with racial composition, rather than with the economic context.

This literature normally makes use of data aggregated at census tracts level. A recent application to mapping social mobility in the Unites States has been developed by Chetty et al. (2018). The "Opportunity Atlas", available for public use, estimates children's economic outcomes using Census data[2]. The authors find that children's success in adulthood is substantially affected by neighbourhood conditions. Moreover, by studying families who moved with young dependants, the authors are able to provide a causal link between relocation and upward mobility for children. Local conditions seem to matter. Studying the very same "Opportunity Atlas", Bergman et al. (2019) analyse why

[2]See `https://www.opportunityatlas.org/`

low-income families stay in low-opportunity areas. The researchers offer a natural explanation; high-income areas impose barriers to moving, such as discriminatory housing practices. Simply overcoming these frictions can be welfare enhancing in terms of upward social mobility. Therefore, the residential mix is an important feature of some places, and it is only natural to wonder about its institutional consequences. Nonetheless, little research has connected these two areas.

3.2.2 Inequality and Institutional Change

Endogenous institutional change has also been analysed in the literature. There is a large body of research dealing with elite capture and the selection of forms of government (Lijphart, 1992; Easter, 1997; Nakaguma, 2015; Robinson and Torvik, 2016). The majority of previous studies focuses in two main dimensions of constitutional design, majoritarian versus proportional representation electoral systems, or between presidential and parliamentary government. Related to our work, political elites can actively pursue different institutional settings in their model.

A strand of this literature connects economic fundamentals with democratic transitions. In an influential paper, Acemoglu and Robinson (2000) argue that democratization processes, such as franchise extension, can be analysed as strategic setting by ruling elites to prevent social unrest or revolution. Inequality plays a pivotal role in increasing the chances of revolution, inducing elites to democratise to attenuate it. Acemoglu and Robinson (2001) extend this model to switches between democracy and autocracy observed around the world, especially in Latin America and Africa. The origin of transitions results from the fact that in democracies, poor might target elites through taxation, and rich will try to mount a coup to regain power. Consolidation of democracy in such scenarios is more difficult. In their model, inequality again seems to play a crucial role; concentrated economic power in small groups will increase political instability. Acemoglu et al. (2007) associate income inequality with political inequality. A small portion of society may have disproportionate institutional power. Using historical data in Cundinamarca municipalities in Colombia, and the mayors' political affiliation, the authors find that land inequality (land Gini), is negatively correlated to political inequality. Surprisingly, the authors also find a positive association between land inequality and economic development. Lagunoff (2009) develops a theoretical model with endogenous institutional reforms to study the drivers of change. Political institutions are modelled as social choices, as such they can either be stable or admit reform. Crucially, one of the nice features of this model is the conception of the dynamic political game, where wealth accumulation can play a pivotal role altering the stability of the system. Ticchi and Vindigni (2010) build a theoretical model to link income inequality with constitutional selection. While a majoritarian model of constitution seems to be preferred by unequal countries, consensual democracies emerge from more uniform societies. In a majoritarian democracy, fiscal policy simply in the form of taxation is set by an elected leader directly. The main takeaway in this literature is that constitutions, and institutions more generally, are intrinsically affected by economic fundamentals.

3.2.3 Decentralisation and Elite Capture

Even though decentralisation has been expected to improve public services by tailoring them to local preferences (see Oates (2008)), a growing literature has raised some awareness on its negative effects (comprehensive surveys on this include Mookherjee (2015); Mansuri and Rao (2012)). One of the most studied problems concerns elite capture, the idea that certain vested interest-groups can redirect and appropriate local institutions to benefit them in corrupt manners. However, an interesting point raised by Bardhan and Mookherjee (2000) compares elite capture at the local level versus the centralised alternative. The authors develop a theoretical model that incorporates electoral competition and lobbying by local elites. A number of factors can affect the likelihood of capture, ranging from interest-group cohesiveness, voters' awareness, electoral competition and heterogeneity in local districts. Given these multiplicity of factors, final outcomes are far from clear. Interestingly, voter ignorance, cohesiveness of interest groups and high income inequality may increase the risk of local capture.

A great deal of empirical work has examined the effects of decentralisation. Some interesting applications to subnational governments are centred in India. Bardhan et al. (2009) study the effect of political decentralisation on political awareness, participation and distribution of benefits in West Bengal, India. They find that the participatory levels are higher in educated affluent groups, but clientelist networks also help to understand the remarkable stability of the government in that province. Uneducated, land-poor and socially backwards groups are prone to clientelism. Evidence in this regard is not conclusive. For instance, in another application to West Bengal, India, Bardhan and Mookherjee (2006*b*) find that targeting of decentralised welfare programs (credit programs and agricultural minikits - seeds, fertilizers and pesticides-) was not influenced by higher poverty, land inequality or low caste composition. Nandwani (2019) analyses the impact of a decentralised program aimed to address grievances in India, the PESA (Panchayats Extension to the Scheduled Areas), on the likelihood of insurgence of a minority economically segregated ethnic group, the Scheduled Tribes (STs). Using a diff-in-diff empirical design, the author finds that the program (PESA) ended up captured by groups within the tribes and *increased* insurgency. Another example of how decentralisation of some programs, if not adequately implemented considering local institutions, can backfire. A very relevant point is raised by Bardhan and Mookherjee (2006*a*). Elite capture of decentralised programs, and its effects on local accountability, cannot be fully internalised without properly exploring the financing connection of such services. The authors develop a theoretical model in which they explore not only provision of these services, but also the way they are financed (user fees, taxes or federal grants). It is shown that user-fee-financing can limit the amount of resource misallocation.

While the preponderant role of institutional quality in the likelihood of elite capture is clear, the constitutional setting reflects the balance of power within a society. Vested interest-groups may appropriate institutional processes, specially at the subnational level. For instance, Dal Bó and Di Tella (2003) consider an extreme form of "nasty" groups, and how such organisations can exert pressure on policy makers. Such groups may use threat, legal harassment or even direct violence. They key point in their model is that these special

groups can redirect policies into their benefit. By making policy outcomes endogenous, the authors are able to capture why some reforms or initiatives may be delayed or never adopted. Martinez-Bravo et al. (2017) explores the extent to which powerful elites can influence politics at the local level. The authors use a quasi-random experimental design in districts in Indonesia, where local mayors (Soeharto's regime mayors) were allowed to stay in power before being replaced during a democratic transition. Those districts that experienced longer exposure to old-regime mayors exhibited worse outcomes, in terms of public good provision and property right enforcement, even after a decade of being replaced. Furthermore, these districts showed weaker political accountability.

Sanctioning municipal charters is ultimately an act of civic engagement. However, self-selection of participants can reduce their representativeness. In their book, Mansuri and Rao (2012) mention that "(P)articipants in such civic activities tend to be wealthier, more educated, of higher social status (by caste and ethnicity), male, and more politically connected than non-participants. In addition, by surveying nearly 500 articles, the authors find certain regularities in terms of the relationship between elite capture and inequality. " '"Capture"' (also) tends to be greater in communities that are remote from centres of power; have low literacy; are poor; or have significant caste, race, or gender disparities".

3.2.4 Alternative Explanations. Theory of Constitutional Contracts

Finally, there is scattered literature that analyses the causes of adoption of local charters in the US, at the municipal level Maser (1985, 1998); Feiock and Yang (2005) or at the county level McDonald and Gabrini (2014). Maser (1985) explores theoretically and empirically the fundamentals behind having charters. His theory of "Constitutional Contracts" where municipal charters are seen as social agreement between citizens is compelling. Changes in economic conditions will affect local demands and therefore the cost-balance of adopting a charter. Maser (1998) further develops this theory. When aggregating social preferences cooperation problems may arise in the form of coordination, division and defection. In this framework, income inequality is a factor that explains specific constitutional rules; local heterogeneity will increase the chance of the municipal charter having safeguards. However, the empirical evidence provided in his work does not find a significant role for inequality. Closely related, Feiock and Yang (2005) study the probability that recall provisions, designed to remove public officials, are included in local charters in US cities. The authors find that adopting this important constitutional safeguard is correlated with the distribution of wealth. McDonald and Gabrini (2014) correlates the likelihood of reforms with socio-economic and political variables. Their methodology resembles our work in the use of "event history approach" (EHA), but the driving channels are different. The authors do not give wealth concentration a role in their analysis, while our work takes account of it. In general, studies undertaken so far provide conflicting evidence concerning the impact of inequality in this constitutional event.

In summary, it has been shown from this review that there are a few strands of literature that connect local segregation to institutional/constitutional change. The four channels explored are immense in range and scope, so I have tried to summarise what I

believe to be closely related to the purpose of this chapter. The rich, wealthier, concentrated elites, along with socio-economic factors, are drivers of change. The repercussions in the institutional setting can therefore be multiple and diverse. In the next section, I proceed to develop the empirical method and its application to the municipal framework of Argentinian municipalities.

3.3 Empirical Strategy

In the previous section we explored the theoretical fundamentals that connect income segregation or inequality to constitutional change. In this section we focus on an application to the institutional setting of Argentinian municipalities, where local governments can dictate their own Municipal Charters (MC). Two initial findings stand out. The first one is that many municipalities sanctioned their MC when were allowed to; albeit at a slow pace (average time to reform is 11 years), and the process being highly influenced by provincial constraints. The second result is that those municipalities that reformed first were more segregated and unequal. In this section, I proceed in three steps. First, I describe the institutional organization of the country. Then I get into detail about how to measure income segregation by using Census data. Once inequality measures are obtained, I proceed to use survival analysis method to study the effect of local disparities in constitutional change.

3.3.1 Provincial Constitutional Reforms and Municipal Autonomy

In order to dictate their own municipal charters, local autonomy must be granted in provincial Constitutions. For historic circumstances, most provinces did not acknowledge municipal autonomy, and therefore adopting MC was banned. In the second column in Table 3.1, I include the year in which provinces reformed their constitution and permitted municipal charters for the first time. As we can observe, even though the country experienced political and institutional turmoil for more than 50 years, over 1930-1983, some democratic milestones were achieved. Seven provinces recognised municipal autonomy before 1983 (Hernández, 2003). However, only one municipality managed to obtain its own MC in 1961, Santiago del Estero. All other municipalities dictated MC after 1983[3].

Once the right institutional setup is granted, municipalities have to meet additional requirements to dictate MC. In general, they involve population thresholds, but they can also include specific requirements such as; complying with provincial plans[4], meeting legal definitions for "cities" or "municipalities"[5], or having a minimum number of registered voters[6]. In some provinces, these requirements have been relaxed in time. The province of Catamarca first reformed in 1993, and established a population threshold of 4,000, then in 2007, this threshold was reduced to 1,000 habitants. Lastly, five provinces do not permit municipal autonomy. Municipalities in these jurisdictions have to follow provincial laws when it comes to institutional, political and constitutional affairs.

[3]It is worth mentioning that the municipalities of Rosario and Santa Fe in the province of Santa Fe dictated their municipal charters in 1933, by-product of the provincial constitutional reform in 1921. However, in 1935, this Constitution was abolished and so did the municipal charters. Santa Fe is currently one of the 5 provinces that do not permit MC.

[4]Formosa and its *Plan Regularizador*.

[5]Cordoba and Rio Negro are examples of this. In Cordoba, *Coronel Moldes* was classified as "city"" by Provincial Decree without meeting the population threshold. Similar cases can be mentioned for *Comallo* or *Ministro Ramos Mexia* in the province of Rio Negro.

[6]Province of Chubut. To be considered elector, it is a requirement to be taxpayer and resident. In the empirical section this is proxied by adult population (defined as 18 plus).

Table 3.1: Provincial Constitutional Reforms and Municipal Charters Requirements

Province	Municipal Autonomy in Prov. Constitutions	Requirements to dictate *"Carta Orgánica"*	Eligible Municipalities	Dictated "Carta Orgánica"	Average Years to Reform (After 1983)
Buenos Aires	(1994)	Not permitted	-	-	-
City of Buenos Aires	(1996)	Not permitted	-	-	-
Catamarca	1966	Population of 10,000	8	8	33.6 (15.6)
Chaco	1994	Population of 20,000*	12	2	12
Chubut	1957	1,000 of registered electors[1]	20	5	7
Córdoba	1987	Population of 10,000**	48	24	11.25
Corrientes	1993-2007	Population of 4,000 in 1993[2] - Population of 1,000 after 2007	30 (1993) - 64 (2007)	12 before 2007 - 37 after 2007	14.22
Entre Rios	2008	Population of 10,000	21	0	-
Formosa	1957	Population of 1,000[3]	36	0	-
Jujuy	1986	Population of 20,000	6	5	2
La Pampa	(1994)	Not permitted	-	-	-
La Rioja	1986	No threshold[4]	18	0	-
Mendoza	(1916)	Not permitted	-	-	-
Misiones	1958	Population of 10,000*	26	11	43.4 (17.4)
Neuquén	1957	Population of 5,000*	14	12	39.3 (12.3)
Rio Negro	1957	Population of 2,000**	38	30	36.9 (9.9)
Salta	1986	Population of 10,000*	25	16	8.5
San Juan	1986	Population of 30,000*	7	7	10.7
San Luis	1987	Population of 25,000	2	2	3
Santa Cruz	1994	Population of 1,000	15	0	-
Santa Fe	(1962)	Not permitted	-	-	-
Santiago del Estero	1960	Population of 20,000*	5	5	32.8 (16.7)
Tierra del Fuego	1991	Population of 10,000	2	2	13
Tucumán	2006	Population of 5,000**	42	0	-
Total			409	178	19.1 (11)

Source: Ministry of Treasury, Sub-secretary for Relations with Provinces, Direction of Tax Coordination with Provinces.
Notes: This Table contains institutional requirements for Municipal governments to dictate their own Municipal Charters *"Carta Orgánica"*.
* Also defined as first-category municipalities by provincial Constitution.
** Provincial Constitution establishes that "cities" or "municipalities" can dictate Municipal Charter. Provincial Laws usually establish a population threshold for such categories. In Cordoba, some urbanizations were labelled as cities by Provincial Decree without meeting the population threshold (Coronel Moldes, Decree Nr. 1127 (1979), with 9,010 habitants in 2010 Census). In Rio Negro, Comallo and Ministro Ramos Mexia are recognised as municipalities.
[1] Proxied using adult population (defined as 18 plus).
[2] The Constitution establishes that localities with 15,000 *must* sanction Municipal Charter (Art. 158), and it is optional for 4,000 habitants (Art. 159).
[3] Municipalities with *"Plan Regularizador"*. To access *Plan Regularizador*, there is a population threshold of 1,000.
[4] No further requirements for Municipalities to dictate *"Carta Orgánica"*.

The last column of Table 3.1 shows that the average time to reform has been 19.1 years. This time is almost halved to 11 years if we start counting from 1984. This is a relevant point. It has been already discussed that the country only gained democratic stability after 1984. This set forth an ongoing process of provincial reforms that among other things facilitated municipal autonomy. For that reason, using 1984 as starting point in the survival analysis section is sound. Results are unaltered if I consider the entire period, but from an institutional perspective results are more comparable if I restrict the analysis after 1984.

To date, a total of 178 municipalities have a Municipal Charter[7]. While in some provinces all compliers have reformed, in provinces such as Entre Rios, Formosa, La Rioja, Santa Cruz and Tucuman, MC are yet to be dictated. This points out to two distinct features. First, it is clear that there are important provincial factors that influence municipal behaviour when it comes to sanctioning MC (132 non-reformers, 32% of eligible municipalities, are located in these provinces with 0 MCs). They range from strictly legal limitations, to soft institutional constraints[8]. Second, given that in those provinces where municipalities indeed proceeded to dictate MC the percentage of compliance is high, time to reform becomes actually relevant. This gives substantial support to a "survival" type of analysis of MC reforms.

3.3.2 Data Description

3.3.2.1 Use of Census Tracts

We use Census tract counts from 2001 and 2010 censuses. Unfortunately, income related questions are not part of Census questionnaires, although a wide range of household characteristics are provided. In particular, we will try to approach income concentration by using the counts in the Census tracts of three main variables; Heads of household that finished secondary studies (5 years after primary education level), Unsatisfied Basic Needs (UBN), an indicator of poverty stratification in the area[9], and Overcrowded Dwellings, defined as households with more than 3 people per room. These predictors have been widely used in the literature as proxies for income (for an application in Argentina, see Rodríguez (2013, 2019); Gasparini et al. (2019), for Chile, Rodríguez Vignoli (2001)).

[7] See Appendix C.1 for a detailed explanation on sources and year of reforms.

[8] In Tucuman for instance, even though the Constitution permit MC, the legal procedure has not been regulated yet and therefore municipalities have not proceed to reform.

[9] In Argentina, INDEC considers a household as having UBN if it meets one of the following characteristics:

- Households with more than three persons per room (overcrowding);
- Households that live in housing of unsuitable type;
- Households with no kind of toilet.
- Households with children of school age not attending school (lack of access to basic education);
- Households with four or more persons per employed member and whose household's head is low level education (less than second grade of primary education).

The literature clearly points out to two main flaws when using Census tracts to study spatial segregation; the Checkerboard Problem and Modifiable Area Unit Problem (MAUP) (Reardon and O'Sullivan, 2004; Rodríguez, 2013, 2019). The checkerboard problem arises when ignoring the spatial allocation of people' characteristics. MAUP originates from the fact that population is grouped in Census tracts, and statistical measures can be affected by its size, as smaller tracts will imply more homogeneous distribution and vice-versa. This last flaw has been specially highlighted by Rodríguez (2013, 2019) for Argentina, and some solutions have been put forward, such as re-grouping smaller areas or redistributing population. We are not particularly concerned with these biases for two reasons. First, census tracts are not built considering household's characteristics, rather they are a tool for logistic organisation of Census (INDEC 2015[10]). Additionally, given that there are institutional limits to dictate MC, essentially population thresholds, our sample of municipalities imply medium to large urban agglomerations, partially averaging out the MAUP bias. The mean number of census tracts for analysed municipalities is 33.5 units, with a maximum reaching 1361 tracts for the city of Cordoba.

Socio-economic residential segregation (SRS) has been studied for Argentinian municipalities, either as case studies or as comprehensive measures of local spatial inequalities. Applications of SRS to case studies can be found in Rodríguez (2016, 2017), for Greater Buenos Aires Agglomeration and the City of Buenos Aires, Perren et al. (2015) for the city of Neuquén, or Molinatti (2013) for the city of Córdoba. Closest to our work in measuring segregation we can mention two papers by Rodríguez (2013, 2019). Rodríguez (2019) compiles the evolution of SRS in 789 cities using three Census (1991, 2001 and 2010). His research is centred around sorting the methodological concern of MAUP in segregation indexes. Furthermore, the author studies the evolution of SRS and explores its correlation with income inequality for a subset of 34 cities where data is available. Similarly, exploiting information in Census tracts, Martínez (2009, 2018) develop dynamic socio-territorial indicators to study patterns of intra-urban inequality in the city of Rosario, one of the biggest agglomerates in the country. Lastly, Groisman (2009) uses the Permanent Household Survey, a different source of data, to study segregation across age cohorts to study persistence and perpetuation of SRS between 2002-2007.

3.3.2.2 Measuring Local Segregation

Income segregation captures the separation of individuals on income within an specific area. Being a complex multidimensional phenomenon, income segregation is strongly linked to income inequality (Reardon and Bischoff, 2011). At the subnational level, it is likely that segregation will be a visible and influential force behind local policies.

There are a number of segregation indexes available to the researcher (for a comprehensive discussion see Tivadar (2019)). In this section, we will only analyse the evenness dimension, simply defined as the distribution of population (on specific characteristics) in the area. Following Reardon and Firebaugh (2002); Reardon and O'Sullivan (2004)) I will use two broadly accepted indexes; the Gini Segregation Index (G) and the Information

[10]https://geoservicios.indec.gov.ar/codgeo/index.php?pagina=definiciones

Theory Segregation Index (H) based on Theil and Finizza (1971); Theil (1972). This selection of measurements is based on two criteria. First, I use the Gini for being broadly accepted, easy to interpret and of generalised use in the literature. Secondly, the Information Theory Index (H) presents a number of desirable properties in term of satisfying axiomatic index characteristics (Reardon and Firebaugh, 2002)[11].

In addition to our segregation measures, Table 3.2 includes descriptive statistics for 4 additional variables that intend to capture economic local conditions. These are municipal population, and a grouping of "human capital variables" that include the percentage of people with UBN, the percentage of overcrowded households, and a measure of literacy in the area, the percentage of people with reading and writing comprehension.

3.3.2.3 A Tale of Two Municipalities

To better appreciate the empirical method, in this subsection I have selected two municipalities in the province of Cordoba as an example; *Villa Carlos Paz* and *San Francisco*. Both local governments have similar population, but only *Villa Carlos Paz* has dictated its Municipal Charter. This institutional landmark was achieved in 2007, 20 years after the provincial reform in 1987 that permitted MCs.

The most relevant variables are in table 3.3. This table is subdivided in two panels, A and B, containing variables for Census 2001 and 2010 respectively. Census 2001 is particularly representative in this case, because it portraits the situation of both municipalities before the reform in *Villa Carlos Paz*. While there are not significant differences in most of the variables, segregation indexes are higher in the reformer municipality. This unevenness in the distribution in household head's education level or in Unsatisfied Basic Needs (UBN) is captured both by the Gini Segregation Index and by the Information Theory

[11] Based on (Reardon and Firebaugh, 2002), I use the "SEG" Stata package developed by Reardon and Townsend. According to the authors, the Gini Segregation Index (G) is calculated as;

$$G = \sum_{m=1}^{M} \sum_{i=1}^{J} \sum_{j=1}^{J} \frac{t_i t_j}{2T^2 I} |\pi_{im} - \pi_{jm}|$$

The Information Theory Index (H), based on Theil and Finizza (1971); Theil (1972), derives from,

$$H = \sum_{m=1}^{M} \sum_{j=1}^{J} \frac{t_j}{TE} \pi_{jm} \ln \frac{\pi_{jm}}{\pi_m}$$

Where,

- t_i: number of cases (counts) in unit i (census tract i)
- π_m: proportion in group m (proportion of households with UBN)
- π_{im}: proportion in group m, of those in unit i (proportion of households with UBN in census tract i)
- I: Simpson's Interaction Index ($I = \sum_{m=1}^{M} \pi_m(1 - \pi_m)$);
- E: Theil's Entropy Index ($E = \sum_{m=1}^{M} \pi_m \ln(\frac{1}{\pi_m})$)
- T: Total number of cases

Table 3.2: Descriptive Statistics Municipalities

	2001 Census			2010 Census		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
A- Household Head's Education						
- Gini Segregation Index (G)	404	0.364	0.140	409	0.335	0.132
- Information Theory Segregation Index (H)	404	0.083	0.052	409	0.074	0.048
B- Unsatisfied Basic Needs						
- Gini Segregation Index (G)	404	0.329	0.129	409	0.354	0.143
- Information Theory Segregation Index (H)	404	0.069	0.044	409	0.074	0.048
C- Overcrowded Households						
- Gini Segregation Index (G)	404	0.374	0.157	409	0.375	0.156
- Information Theory Segregation Index (H)	404	0.073	0.049	409	0.071	0.046
Percentage with -at least one- UBN	404	0.083	0.052	409	0.149	0.088
Percentage of overcrowded households	404	0.231	0.109	409	0.064	0.043
Percentage with reading and writing comprehension	404	0.808	0.052	409	0.908	0.029
Population	405	29,230	80,821	409	32,331	85,825

Note: This Table presents a summary of segregation indexes, Gini (G) and Information Theory (H) for three variables, Household Head's Education in Panel A, Unsatisfied Basic Needs in Panel B and Overcrowded Households in Panel C. Additionally, four relevant covariates are included. All these statistics are portrayed for Census 2001 and 2010.

Segregation Index. In Panel B, for Census 2010, these patterns are repeated, although they are not as clear-cut as in 2001.

Using data from Census 2001, Figures 3.1 and 3.2 offer a visual appreciation of the previous results. Figure 3.1 shows the percentage of households in which the head of the family achieved education level higher than secondary school, allocated by Census tracts[12]. The difference in shades in both cities stands out. In Carlos Paz, the contrast between some areas is sharper than in San Francisco. While we observe darker blues in north-eastern or centre areas and whiter colours in the south or western areas in Figure 3.1a, these contrasts are not observed or less abrupt in Figure 3.1b. Figure 3.2 shows the distribution of households not meeting any of the conditions for UBN distributed by Census tracts in these two municipalities. We can reach similar conclusions regarding the segregation in both cities. The contrast is less pronounced and less abrupt in Figure 3.2b than in Figure 3.2a. Even more, the spatial location of these two variables seems fairly similar to Figure 3.1.

[12]In 2001, *Villa Carlos Paz* was conformed by 72 Census tracts or blocks groups, while *San Francisco* was divided in 76. The polygons contain an average of 230 households and vary in shape.

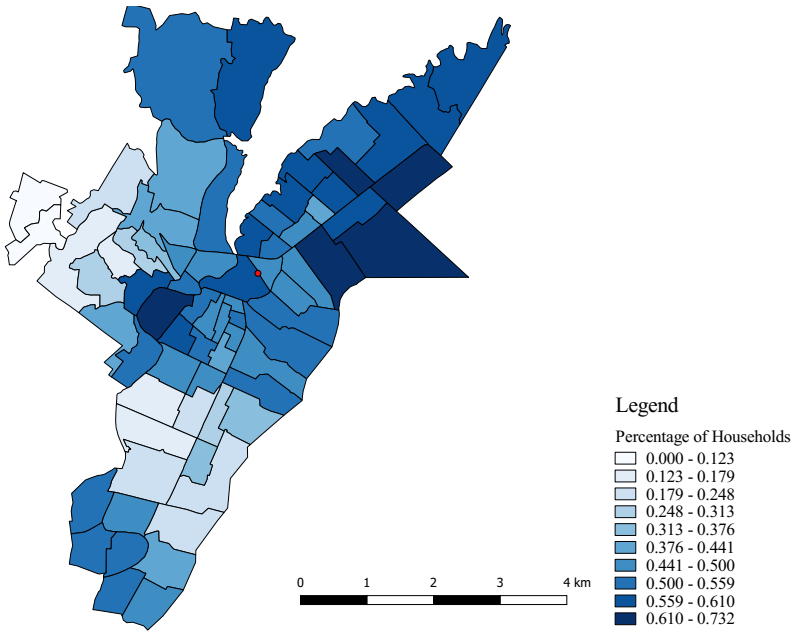
Table 3.3: Distribution of Indicators for *Villa Carlos Paz* and *San Francisco*, Córdoba

	Villa Carlos Paz	*San Francisco*
Year dictated Municipal Charter	2007	-
"Survival" (years from provincial reform in 1987)	20	-
Panel A: Variables Census 2001		
Population	56,407	58,983
Number of Census tracts	72	76
Percentage with -at least one- UBN	0.072	0.095
Percentage of overcrowded dwellings	0.031	0.032
Percentage with reading and writing comprehension	0.893	0.883
Gini Segregation Index (G)		
-Segregation on Household Head's Education	0.368	0.321
-Segregation on Unsatisfied Basic Needs	0.468	0.402
Information Theory Segregation Index (H)		
-Segregation on Household Head's Education	0.085	0.058
-Segregation on Unsatisfied Basic Needs	0.092	0.071
Panel B: Variables Census 2010		
Population	62,750	62,211
Number of Census tracts	87	84
Percentage with -at least one- UBN	0.043	0.026
Percentage of overcrowded dwellings	0.025	0.012
Percentage with reading and writing comprehension	0.952	0.946
Gini Segregation Index (G)		
-Segregation on Household Head's Education	0.42	0.34
-Segregation on Unsatisfied Basic Needs	0.58	0.65
Information Theory Segregation Index (H)		
-Segregation on Household Head's Education	0.105	0.069
-Segregation on Unsatisfied Basic Needs	0.136	0.168

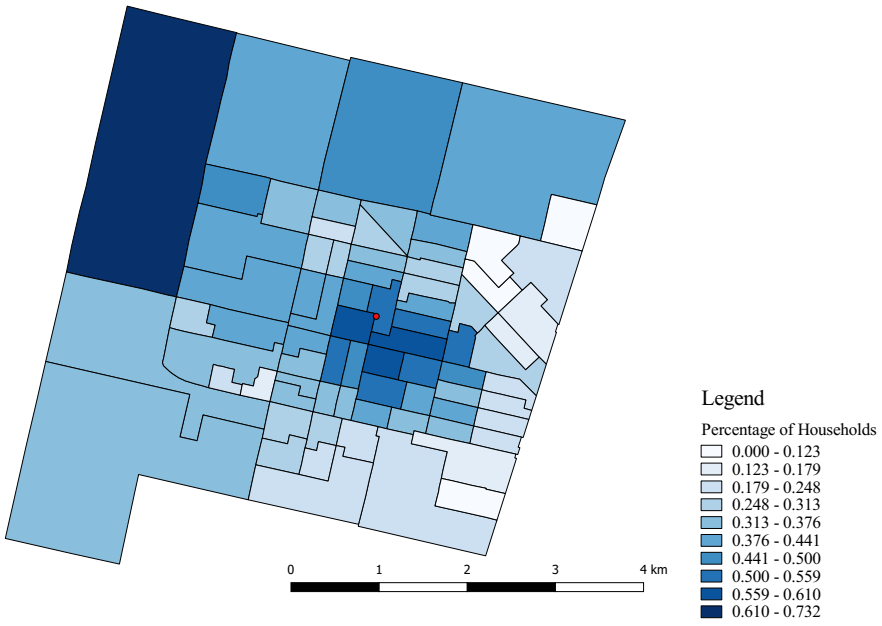
Notes: This Table portraits an example for two cities in the province of Cordoba that have followed opposite paths in terms of Municipal Charter reforms. While Villa Carlos Paz reformed in 2007, San Francisco remains without MC. The table compares a number of variables using 2001 and 2010 Census, and the calculated measures of segregation using the Gini Segregation Index (G) and Information Theory Segregation Index (H).

Figure 3.1: Concentration of Household Head's Education Levels

(a) *Villa Carlos Paz*, Córdoba



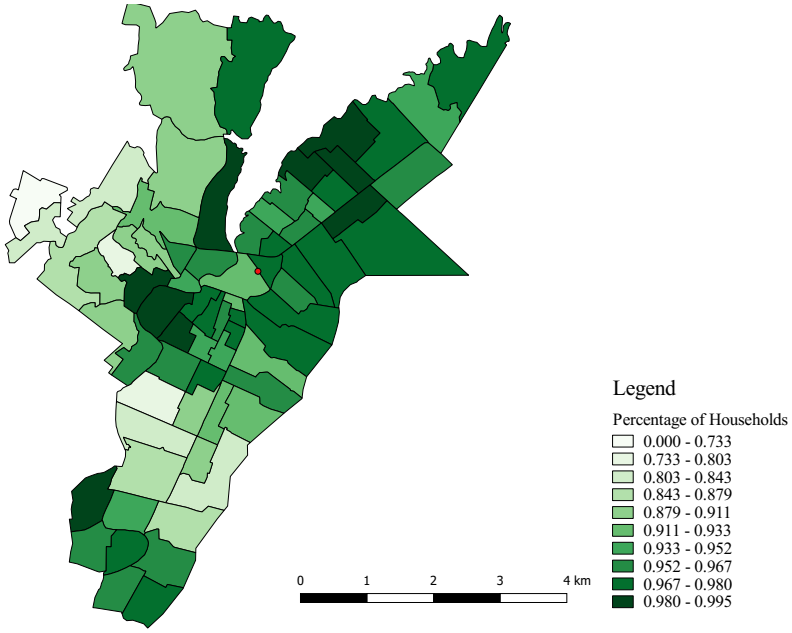
(b) *San Francisco*, Córdoba



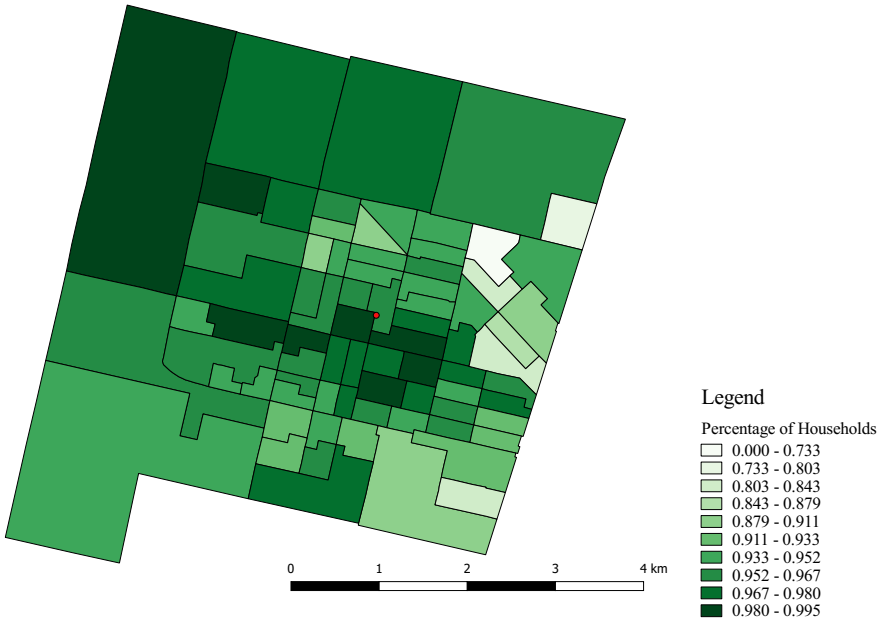
Note: This Figure shows the spatial location by Census tracts of percentages of household head's with education levels greater than secondary school. Two municipalities in the provinces of Córdoba are displayed, both with similar population but with different segregation indexes.

Figure 3.2: Concentration of Households with no Unsatisfied Basic Needs

(a) *Villa Carlos Paz*, Córdoba



(b) *San Francisco*, Córdoba



Note: This Figure replicates the previous two municipalities in Córdoba, but in this case, the segregation indexes are calculated on the percentage of people with no Unsatisfied Basic Needs.

3.3.3 Cox Semi-parametric Model

To determine whether institutional change, in the form of the sanction of municipal charters, is influenced by segregation, I analyse 409 municipalities that were in legal and in institutional conditions to adopt MC. This process can be approached as a survival model, where failure is MC reform, and the units (municipalities) start treatment when provinces permit MC for the first time. The identification strategy relies in the plausibly exogenous provincial decision to reform the Constitution. We base this in three observations. First, the span that covers provincial reforms is ample (Chubut in 1957 and Entre Rios in 2008 (see Table 3.1)). If municipalities were a driving force behind provincial reforms, we would not expect such divergence in timing. Second, even in the case of constitutional reforms at the provincial level, municipal autonomy was not always a central point and it was not always granted thereafter (for instance, Buenos Aires in 1994). Third, the institutional limits, normally population thresholds, leave out a considerable number of municipalities and prevent them from adopting charters. By exploiting this, we use the Cox proportional hazards model. Our main empirical specification presents the following structure:

$$h(t) = h_0(t) \exp(\beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k) \tag{3.1}$$

The Cox regression models the likelihood of sanctioning Municipal Charter as a function of time (from provincial reform) and municipal specific covariates. These x_k variables include provincial dummies, local population, and a set of "human capital" municipal variables; including the percentage of people with UBN, of overcrowded households and of literacy levels.

We try to exploit the cross-sectional nature of the dataset using each Census in the following way. First, we run the first set or regression using only data on Census 2001. This is far from ideal, as we would like to have information pre-dating MC sanctioning. Unfortunately, despite my best efforts, data for Census 1991 was not accessible. For those municipalities that reformed between 1991 and 2001, the segregation measures will be ex-post reform. Second, in order control for this, I restrict the analysis only to those municipalities that reformed after 2001. This allows us to further argue in favour of the channel that goes from segregation measures to institutional reforms, rather than otherwise. Finally, in an attempt to get the clearest possible picture in terms of segregation and population just before reforms[13], for those municipalities that either reformed after 2010 or haven't reformed yet, Census 2010 data is used.

The first set of results obtained from the semi-parametric Cox model are displayed in Table 3.4. This table is divided in three panels A, B, and C. In Panel A, the two indexes of segregation, Gini and Information Theory Index, are calculated on the counts within the Census tract of heads of households with more than secondary education. Panel B shows the results using the counts of households with Unsatisfied Basic Needs, and Panel C uses the number of Overcrowded Households in the area. For each index, two alternative models were calculated, one including only a set of provincial dummies and the other adding municipal covariates.

[13]Population thresholds might be binding in one Census and not in the following.

The results seem to support the hypothesis that inequality is a driving force of MC sanctioning. Higher segregation is positively correlated with the likelihood of enacting Municipal Charter, and this relationship is significant at 1%. Moreover, these findings are robust to different segregation indexes and model specifications. Given that indexes are scaled from 0 to 100, the quantitative results in column (1) imply that an increase in one point in Gini increases the hazard of sanctioning municipal charters by 4.9%. Alternatively, in column (11), for an unit change in the Information Theory Segregation Index, the probability of MC jumps to 14.4%[14].

These findings are best summarised in Figure 3.3. For the Gini Segregation Index, in Panel 3.3a, the hazard is constructed by selecting both the 10% and 90% values in the decile distribution of Gini, and generating the instantaneous hazards for each measure. That gives us the "High" and "Low" segregation hazard rates in every period of time. For this theoretic municipality with high segregation, i.e., the top 90% of the distribution, there is roughly 4.4% chance of sanctioning Municipal Charter in its 15th year without reform. This hazard is 1.6% at the same period for a low-segregation municipality. Panel 3.3b plots the same estimations but for the Information Theory Index (H).

The overall fit of the model is good. Both the inclusion of provincial dummies and municipal covariates is validated by the Wald test of joint significance. This is corroborated by the selection of the preferred model using the Akaike information criterion (AIC), which hits smaller values in specifications that include the full set of covariates. Lastly, the proportional hazards test does not hold for most of the specifications in Table 3.4. This points out certain problems with using the Cox proportional hazard. However, somewhat reassuringly, when interacting offending variables with time the results are not altered (see Appendix C.2 for further analysis on this important issue).

3.3.3.1 Reformers After 2001

As previously mentioned, the next step was to restrict the analysis to those municipalities that sanctioned MC after 2001. What we are trying to avoid is the confounding factor of reverse causality driven by inequality being measured after reforms. In this subsample, segregation measures were taken before MC reforms, in Census 2001, and thus reinforcing one direction of the correlation.

In Table 3.5, Cox model (3.1) is re-estimated using all covariates but only for the sub-period after 2001. The number of municipalities in the sample is reduced to 301, 75 of which would reform MC at some point between 2001 and 2017[15]. Overall, results are fairly consistent with baseline specifications in their significance levels. When comparing

[14]Following Box-Steffensmeier and Jones (2004), I use of the following formula:

$$\%\Delta h(t) = [\frac{e^{(\beta_i(x_i=X_2))} - e^{(\beta_i(x_i=X_1))}}{e^{(\beta_i(x_i=X_1))}}]$$

For instance, in column (1) Table 3.4, the coefficient associated with the Gini Segregation Index of 0.0483 implies that one standard deviation from the mean, from 36.4 to 50.4 (+14), increases the likelihood of MC reform in 96.6%.

[15]There is one municipality that drops from the regressions due to not having segregation measures.

Table 3.4: Survival Analysis, Dictated Municipal Charter *"Carta Orgánica"*

Dep. Var.: Survival time to Municipal Charter sanction	(1)	(2)	(3)	(4)
Panel A: Segregation on Household Head's Education				
Gini Segregation Index (G)	0.0483^{+++}	0.0432^{+++}		
	(0.00680)	(0.00745)		
Information Theory Segregation Index (H)			0.101^{+++}	0.0815^{+++}
			(0.0165)	(0.0186)
Municipal population -in ten thousands-(2001)		0.0148^{+++}		0.0156^{+++}
		(0.00494)		(0.00509)
Percentage with -at least one- UBN (2001)		-0.00611		-0.00717
		(0.0283)		(0.0274)
Percentage of overcrowded dwellings* (2001)		-0.0250		-0.0153
		(0.0330)		(0.0327)
Percentage with reading and writing comprehension (2001)		0.136^{++}		0.134^{++}
		(0.0563)		(0.0534)
Provincial Dummies	Yes	Yes	Yes	Yes
Pseudo R^2	0.133	0.157	0.127	0.150
AIC	1727.7	1688.6	1739.4	1703.9
	(5)	(6)	(7)	(8)
Panel B: Segregation on Unsatisfied Basic Needs				
Gini Segregation Index (G)	0.0648^{+++}	0.0489^{+++}		
	(0.00680)	(0.00764)		
Information Theory Segregation Index (H)			0.161^{+++}	0.116^{+++}
			(0.0167)	(0.0198)
Municipal population -in ten thousands-(2001)		0.0117^{++}		0.0114^{++}
		(0.00476)		(0.00476)
Percentage with -at least one- UBN (2001)		-0.00749		-0.0141
		(0.0272)		(0.0261)
Percentage of overcrowded dwellings* (2001)		-0.0172		-0.00721
		(0.0335)		(0.0324)
Percentage with reading and writing comprehension (2001)		0.0821		0.0884^{+}
		(0.0538)		(0.0506)
Provincial Dummies	Yes	Yes	Yes	Yes
Pseudo R^2	0.148	0.157	0.142	0.153
AIC	1689.9	1679.5	1710.7	1697.3
	(9)	(10)	(11)	(12)
Panel C: Segregation on Overcrowded Households				
Gini Segregation Index (G)	0.0537^{+++}	0.0430^{+++}		
	(0.00667)	(0.00674)		
Information Theory Segregation Index (H)			0.135^{+++}	0.102^{+++}
			(0.0163)	(0.0178)
Municipal population -in ten thousands-(2001)		0.0153^{+++}		0.0143^{+++}
		(0.00453)		(0.00455)
Percentage with -at least one- UBN (2001)		0.00766		-0.000695
		(0.0263)		(0.0255)
Percentage of overcrowded dwellings* (2001)		0.0165		0.0116
		(0.0312)		(0.0311)
Percentage with reading and writing comprehension (2001)		0.124^{++}		0.123^{++}
		(0.0512)		(0.0489)
Provincial Dummies	Yes	Yes	Yes	Yes
Pseudo R^2	0.149	0.159	0.141	0.153
AIC	1697.1	1686.5	1712.1	1689.2
Nr. of Subjects	401	401	401	401
Nr. of Failures	174	174	174	174

Robust standard errors in parentheses

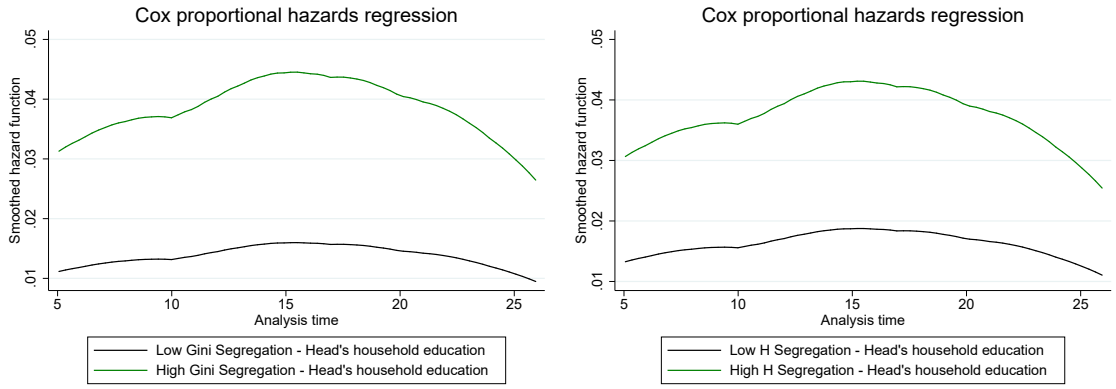
$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Source: National Institute of Statistics and Censuses (INDEC, in its Spanish acronym) National Census of Population, Households, and Housing 2001.

Notes: This table shows the Cox estimates for three different dimensions of income segregation; Household Head's Education Level, Unsatisfied Basic Needs, and Overcrowded Households. Two segregation indexes are used, the Gini (G) and the Information Theory Index (H), and two alternative specifications are estimated, one only including provincial dummies and the other accounting for a full set of municipal covariates. Results point out to a significant positive effect of segregation on the likelihood of reforming municipal charters.

Figure 3.3: Hazard Rate at Top 90% and Bottom 10%. Household Head's Education

(a) *Gini Segregation Index (G)* (b) *Information Theory Segregation Index (H)*



Note: This Figure portraits the differential hazard rate valued at the top 90% and the bottom 10% of the distribution of both indexes; the Gini Segregation Index (G) and the Information Theory Segregation Index (H).

the quantitative results no clear patter arises. In some cases the impact on the hazard increases (Gini Index for household education level changes from 4.3% to 4.8%), while in others it decreases (Gini Index for overcrowding households move from 4.3% to 3.2%).

3.3.3.2 Using Census 2001 and 2010

Finally, we try to exploit both censuses 2001 and 2010. For those municipalities that reformed after 2001, we get all our measures as close as we can to the year of reform. An important point is worth mentioning here. The inclusion of covariates in this last specification adds a lot of noise. During Census 2001, the country was navigating through one of its most pronounced economic crisis. Therefore, it is expected to find an overall improvement in our "human capital" variables in the measurement in 2010. Reassuringly, the most relevant findings are consistently observed, albeit with a slight modification in the quantitative impact.

Table 3.5: Survival Analysis after 2001, Dictated Municipal Charter *"Carta Orgánica"*

	A- Head Education Level		B- Unsatisfied Basic Needs		C- Overcrowded Households	
	(1)	(2)	(3)	(4)	(5)	(6)
Gini Segregation Index (G)	0.0485^{+++}		0.0442^{+++}		0.0322^{+++}	
	(0.0102)		(0.0147)		(0.0118)	
Information Theory Segregation Index (H)		0.0824^{+++}		0.120^{+++}		0.0821^{++}
		(0.0247)		(0.0439)		(0.0390)
Full Set of Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Provincial Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Subjects	301	301	301	301	301	301
Number of Failures	74	74	74	74	74	74
Pseudo R^2	0.235	0.223	0.224	0.221	0.221	0.218

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Source: National Institute of Statistics and Censuses (INDEC, in its Spanish acronym) National Census of Population, Households, and Housing 2001.

Notes: This Table replicates model specifications in Table 3.4 but restricting the sample to those municipalities that reformed after 2001. The six specifications include full set of covariates and provincial dummies (not shown).

Table 3.6: Survival Analysis using Census 2001 and 2010, Dictated Municipal Charter *"Carta Orgánica"*

	A- Head Education Level		B- Unsatisfied Basic Needs		C- Overcrowded Households	
	(1)	(2)	(3)	(4)	(5)	(6)
Gini Segregation Index (G)	0.0273^{++}		0.0277^{++}		0.0417^{+++}	
	(0.0119)		(0.0132)		(0.0130)	
Information Theory Segregation Index (H)		0.0470		0.0818^{++}		0.123^{+++}
		(0.0326)		(0.0367)		(0.0405)
Full Set of Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Provincial Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Subjects	305	305	305	305	305	305
Number of Failures	74	74	74	74	74	74
Pseudo R^2	0.267	0.264	0.267	0.266	0.277	0.274

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Source: National Institute of Statistics and Censuses (INDEC, in its Spanish acronym) National Census of Population, Households, and Housing 2001.

Notes: This Table replicates model specifications in Table 3.4 but restricting the sample to those municipalities that reformed after 2001. The six specifications include full set of covariates and provincial dummies (not shown).

3.4 Conclusions

This study set out to assess the connections between local segregation and institutional change, in the form of adopting municipal charters, in Argentinian municipalities. We provided evidence that segregation in education levels, poverty and household overcrowding was consistently correlated to the likelihood of sanctioning MC. In particular, we observed that when municipalities were exposed to the possibility of sanctioning, granted by provincial reforms, it was a matter of time until they tailored local preferences by adopting the written institutional document.

In the conceptual framework, we have examined four potential channels that relate local segregation to institutional change. First, we showed related research on how local conditions determine a number of outcomes. Second, we discussed the endogenous institutional change literature and the role of inequality in explaining democratic transitions. Third, we explored the idea that elite capture and several other maladies can have their origins in the decentralised structure of a country. And lastly, we acknowledged the "Constitutional Contract Theory" where charters are seen as aggregations of citizen preferences.

This chapter breaths life into these mechanisms in two ways. The first one, and our main conclusion, is that there is a strong and consistent correlation between segregation and the likelihood of sanctioning MC. Exploiting the timing of exogenous provincial reform of Constitutions, we observe that higher socio-economic segregation significantly increases the chances of reforming. The second one is that provincial factors are relevant to the adoption of municipal charters. When countries are organised in more than one tier of government, it is not unusual to find discrepancies across the institutional organisation of provinces (or states). In this chapter, we show that provinces play a significant role in explaining MC reforms.

A number of future directions for research are signalled. The current study is limited to 2001 and 2010 Census, but the addition of the 1991 round seems natural. This will increase the strength of results by adding more municipalities with a picture of pre-reform segregation levels. Furthermore, in this work we have been silent regarding the particular provisions included in the 178 new charters. Municipal charters can potentially influence a number of important policy outcomes, such as type of nomination to run for elected officials, council size, partisanship in elections, or executive powers (Maser, 1985). Additionally, modern MCs regulate gender parity, minority representation, or environmental regulations. Future lines of research can explore the connections between these two areas. Another methodological extension of the present study could involve instrumenting socio-economic segregation in order to disentangle causal mechanisms.

Improving the quality and quantity of local services has long been a concern for developing countries. A number of factors influence and define the scope of local institutions. In this chapter we explored a constitutional method by which citizens adapt provisions to local preferences. If not considered carefully, this process may end up being captured by local powerful groups and the gains from decentralisation may diminish. As a policy

implication, it is relevant to be aware of the intricate workings of local urban inequalities. A sound analysis made by Bardhan and Mookherjee (2006*a*) points out that decentralisation is a two-sided process; not only local services are important, but also the way these programs are financed.

Appendix A

Appendix Chapter 1

A.1 Provincial Fiscal Data

Fiscal data for provinces comes from three different sources:

1. School of Economics - Buenos Aires University (FCE-UBA) - Public Administration Research Centre (*Centro de Investigaciones en Administración Pública (CIAP)*):
    - Period 1983-1990: *Ejecución por clasificación económica metodología ampliada 1983*, Executed Budget based on National Bureau of Fiscal Coordination with Provinces - Ministry of Economics of Argentina (DNCFP- MECON).
    - Period 1991-2002: *Ejecución por clasificación económica. Metodología nueva 1991-Cuadro 1.1.1.6*, Executed Budget based on National Bureau of Fiscal Coordination with Provinces - Ministry of Economics of Argentina (DNCFP-MECON).
    - Period 2003-2004(2011): *Ejecución por clasific. económica 2003-2010 Cuadro 1.1.1.7a* Executed Budget based on National Bureau of Fiscal Coordination with Provinces - Ministry of Economics of Argentina (DNCFP-MECON).
    - Period 1990-2011(2012): *1.3.1.- Recursos tributarios provinciales a partir de 1990*, Executed Budget based on National Bureau of Fiscal Coordination with Provinces - Ministry of Economics of Argentina (DNCFP-MECON). Information disaggregated on tax revenues per province.
2. National Bureau of Fiscal Coordination with Provinces - Ministry of Economics of Argentina (DNCFP-MECON):
    - Period 2005-2014: Series on Provincial Accounts: The information in MECON from 2005-2014 includes both Social Security Contributions (*Contribuciones a la Seguridad Social*) and Social Security Expenditure (*Prestaciones de la Seguridad Social*). In order to make it comparable with previous sources, data on social contributions was omitted.
    - Period 2012-2013: yearly tax revenues disaggregation.

3. Revenue data year 2014: A combination of provincial sources, including the General Accountant Office, Revenues Office (*Rentas*), the Argentinian' Association of Budget and Public Financial Administration (*ASAP*), and in some cases, estimations based on third quarter data on 2014 from National Bureau of Fiscal Coordination with Provinces - Ministry of Economics of Argentina (DNCFP-MECON).

A.2 Macroeconomic Variables

A.2.1 Gross Geographic Product (GGP)

The data on provincial GGP was especially challenging. Each province has its own statistics institute, and therefore methodology varies (e.g., year used as base for the constant series). Updated information availability was also an issue. For instance, 2005 is the last year of GGP data for the province of Santa Cruz. In the next subsection, we discuss how we dealt with constant and current values for GGPs. Source and specific clarifications are summarised in Tables A.2.1.1 and A.3.

A.2.1.1 Constant Gross Geographic Product

The predominant base year for most of provincial series was 1993. However, given that the National Institute of Statistics and Censuses (INDEC, in its Spanish acronym) updated the base year for the National GDP series to 2004, some provinces have updated their base since (City of Buenos Aires, Entre Rios and Neuquen). In such cases, I maintained 1993 but applied yearly growth rates from new bases. Most of the information from 1993 to 2012 was compiled by the Ministry of Industry of Argentina, based on provincial sources[1]. The data from 1982 to 1993 was obtained from both Russo (1997) (from 1970 to 1995) and Porto (2004) (from 1971 to 2001). This data was collapsed using yearly growth rates.

The issue of non-updates was difficult to deal. Most provincial centres did not have information for 2014, and some provinces stopped publishing as far as 2006. Fortunately, along with GGP calculations, local provincial institutes elaborate local economic activity indicators, based on real and monetary variables (for a survey on compound indexes for Argentina refer to Jorrat (2005) or Muñoz and Trombetta (2015)). When this information was available, the GGP was adjusted using the yearly growth rate in this indicator. Otherwise, we used the Provincial Index for Economic Provincial Activity (IPAE for the Spanish acronym), elaborated by Direction of Statistics, Census and Documentation of the Province of Formosa[2].

A final hurdle was to adapt the different types of GGPs. When possible, market price GGP was used. The main difference between producer's prices GGP and market prices

[1]The following link contains a detail of sources: `https://docs.google.com/spreadsheets/d/17lNxSmsYsQ40DdIy2Tjb9hMhlBjadAQAOpzIRzytIL0/edit?usp=sharing`. Last accessed October 2019.

[2]Last accessed October 2019 using capture August 2016 in Wayback Machine: `http://web.archive.org/web/20160808162907/https://www.formosa.gob.ar/estadisticas/indicadoresactividad`

GGP are Federal taxes (VAT and Income Tax) [3].

$$\text{GGP market prices} = \text{GGP producer's prices} + \text{Taxes}$$

$$\text{GGP basic prices} = \text{GGP producer's prices} - \text{Taxes}$$

All the relevant information is summarised in Table A.1.

[3]From collected sources, both taxes represent an average of 9% of market GGP.

Table A.1: Constant GGP Series Details

Province	Type of PBG	Source
Buenos Aires	GGP market prices	1982-1991 Russo (1997); 1992 Porto (2004); 1993-2013 Provincial Statistic Institute; 2014 estimated based on ITAE Provincial Activity Indicator
Catamarca	GGP market prices	1982 -1992 Russo (1997);1993-2006 Ministry of Industry; 2007-2014 estimated by yearly growth rate of IPAE
Chaco	GGP market prices	1982 -1992 Russo (1997);; 1991-2004 Ministry of Industry; 2005-2014 estimated using IMACH Provincial Activity Indicator
Chubut	GGP market prices	1982 -1992 Russo (1997);1993-2014 Provincial Statistic Institute
Ciudad de Bs. As.	GGP market prices	1982 -1993 Russo (1997);1993-2004 City of Buenos Aires Statistic Institute; 2005-2014 Provincial Statistic Institute series base year 2004
Cordoba	GGP producer prices	1982 -1992 Russo (1997); 1993-2014 Provincial Statistic Institute
Corrientes	Unknown	1982 -1992 Russo (1997); 2014 estimated as average quarterly in the Provincial Statistic Institute web page
Entre Ríos	GGP producer prices	1982 -1992 Russo (1997); 1993-2004 Provincial Statistic Institute - 2005-2014 Provincial Statistic Institute series base year 2004
Formosa	Unknown	1982 -1992 Russo (1997); 1993-2007 Ministry of Industry -2008-2014 estimated by yearly growth rate of IPAE
Jujuy	GGP market prices	1982 -1992 Russo (1997); 1993-2008 Ministry of Industry; 2007-2014 estimated by yearly growth rate of IPAE
La Pampa	GGP producer prices	1982 -1992 Russo (1997); 1993-2008 Ministry of Industry; 2009-2014 estimated by yearly growth rate of IPAE
La Rioja	Unknown	1982 -1992 Russo (1997); 1993-2012 Provincial Statistic Institute; 2013-2014 estimated by yearly growth rate of IPAE
Mendoza	Unknown	1982-1985 Russo (1997); 1986-1990 Provincial Statistic Institute series base year 1986; 1991-2014 Provincial Statistic Institute series base 1993
Misiones	GGP market prices	1982-1990 Russo (1997); 1991-2007 Ministry of Industry; 2008-2014 estimated by yearly growth rate of IPAE

Table A.1 – Continued from previous page

Province	Type of PBG	Source
Neuquen	GGP Basic prices	1982-1992 Provincial Statistic Institute series base year 1986; 1993-2004 Provincial Statistic Institute series base year 1993; 2005-2013 Provincial Statistic Institute series base year 2004; 2014 estimated by yearly growth rate of IPAE
Río Negro	Unknown	1982 -1992 Russo (1997); 1993-2008 Ministry of Industry; 2009-2014 estimated by yearly growth rate of IPAE
Salta	Unknown	1982 -1992 Russo (1997); 1993-2009 Ministry of Industry; 2010-2014 estimated by yearly growth rate of IPAE
San Juan	Unknown	1982 -1992 Russo (1997); 1993-2010 Ministry of Industry; 2011-2014 estimated by yearly growth rate of IPAE
San Luis	Unknown	1982 -1992 Russo (1997); 1993-2007 Ministry of Industry;2008-2014 estimated by yearly growth rate of IPAE
Santa Cruz	GGP market prices	1982 -1992 Russo (1997); 1993-2005 Ministry of Industry; 2006-2014 estimated by yearly growth rate of IPAE
Santa Fe	Unknown	1982 -1992 Russo (1997); 1993-2013 Provincial Statistic Institute series base year 1993- 2014 estimated using ISAE
Santiago del Estero	GGP producer prices	Russo (1997); 1993 Provincial Statistic Institute - 1994-2007 Ministry of Industry; 2008-2014 estimated by yearly growth rate of IPAE
Tierra del Fuego	Unknown	1982 -1992 Russo (1997); 1993-2007 Provincial Statistic Institute series base year 1993; 2008-2014 estimated by yearly growth rate of IPAE
Tucuman	GGP market prices	1982 -1992 Russo (1997); 1993-2014 Provincial Statistic Institute series base year 1993

Notes: In this Table we find a detailed account of the sources for Constant Gross Geographic Product. We use a combination of Russo (1997), provincial statistic institutes and IPAE (Provincial Activity Index), elaborated by the Institute of Statistics in Formosa.

A.2.1.2 Current Gross Geographic Product

Compilation of current GGP series faced similar issues; swaps in the base year, economic instability (including hyperinflation and three changes in the national currency from 1982 to 1992), and lack of updates. Based on the constant series, we obtained the current values using the GDP Deflator (Implicit Price Deflator (GDP-IPD)). We also employed the current series in Ministry of Industry of Argentina public file[4], and provincial statistic institutes. In following Table A.3, there is a detailed explanation of different sources for each province.

A.2.2 Population

Based on the INDEC, and Census performed every 10 years, 1980, 1991, 2001 and 2010, the province population for each year was adjusted at a constant rate coincident with the decade variation.

A.2.3 Inflation Rate

Over the 30 years covered by the dataset, there were periods of great instability in the economy, including hyperinflation and change in currency. In the following Table A.2 we can observe the relation between currencies. After 2010, 2001-2010 variation is used.

Table A.2: Currencies in Argentina

Used from	Currency name	Relation to	Divided by
01/01/1992	Pesos		
18/06/1985	Australes	Pesos	10,000
01/06/1983	Pesos Argentinos	Pesos	10,000,000
01/04/1970	Pesos Ley 18188	Pesos	100,000,000,000

We halted the use of official price indexes from INDEC after 2007, because the institute was intervened by the government, and the CPI was blatantly modified (reduced) thereafter. For that reason, we used the price index from the Billion Price Project at MIT (see (Cavallo, 2013) for more details). The index base is 31/10/2007 and we have used this year as base for constant values.

[4]The next link contains a detail of sources: `https://docs.google.com/spreadsheets/d/17lNxSmsYsQ4ODdIy2Tjb9hMhlBjadAQAOpzIRzytILO/edit?usp=sharing`. Last accessed October 2019.

Table A.3: Current GGP Series Details

Province	Type of PBG	Source
Buenos Aires	PBG market prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2013 Provincial Statistic Institute; 2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Catamarca	PBG market prices	1982-1989 nominal growth rate adjustment using constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2006 Ministry of Industry; 2007-2014 (nominal growth rate adjustment using constant series adjusted by GDP-IPD
Chaco	PBG market prices	1982-1989 nominal growth rate adjustment using constant series adjusted by GDP-IPD; 1990-1991nominal growth rate adjustment based on CIAP (FCE-UBA); 1991-2008 Ministry of Industry; 2009-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Chubut	PBG market prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2011 Ministry of Industry; 2012-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
City of Bs. As.	PBG market prices	1982-1989constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2003 Provincial Statistic Institute, 2004-2014 nominal growth adjustment using current series different base year
Cordoba	PBG producer prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2014 Provincial Statistic Institute
Corrientes	Unknown	1982-1989constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2013 Provincial Statistic Institute

Table A.3 – Continued from previous page

Province	Type of PBG	Source
Entre Rios	PBG producer prices	1982-1989constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2003 Provincial Statistic Institute; 2004-2014 nominal growth adjustment using current series different base year
Formosa	Unknown	1982-1989constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2007 Ministry of Industry; 2008-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Jujuy	PBG market prices	1982-1989constant series adjusted by GDP-IPD; 1990-1992nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2006 Ministry of Industry; 2007-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
La Pampa	PBG producer prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2008 Ministry of Industry; 2009-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
La Rioja	Unknown	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2011 Provincial Statistic Institute; 2012-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Mendoza	Unknown	1983-1985 Provincial Statistic Institute change in currency; 1986-1990 nominal growth adjustment using current series different base year; 1991-2014 nominal growth adjustment using current series different base year
Misiones	PBG market prices	1990-1994 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2007 Ministry of Industry; 2007-2014 Provincial Statistic Institute; 2008-2014 nominal growth adjustment using current series different base year

Table A.3 – Continued from previous page

Province	Type of PBG	Source
Neuquen	PBG Basic prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2013 nominal growth adjustment using current series different base year; 2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Rio Negro	Unknown	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2008 Ministry of Industry; 2009-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Salta	Unknown	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2010 Ministry of Industry; 2011-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
San Juan	Unknown	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2010 Ministry of Industry; 2011-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
San Luis	Unknown	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2007 Ministry of Industry; 2008-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Santa Cruz	PBG market prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2005 Provincial Statistic Institute; 2006-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Santa Fe	Unknown	1982-1989 constant series adjusted by GDP-IPD;1990-1992nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2013 Provincial Statistic Institute; 2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD

Table A.3 – Continued from previous page

Province	Type of PBG	Source
Santiago del Estero	PBG producer prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1993 nominal growth rate adjustment based on CIAP (FCE-UBA); 1994-2013 Provincial Statistic Institute; 2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Tierra del Fuego	Unknown	1982-1989 constant series adjusted by GDP-IPD; 1990-1993 nominal growth rate adjustment based on CIAP (FCE-UBA); 1994-2001 nominal growth rate adjustment using CEPAL ; 2002-2007 Ministry of Industry; 2008-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD
Tucuman	PBG market prices	1982-1989 constant series adjusted by GDP-IPD; 1990-1992 nominal growth rate adjustment based on CIAP (FCE-UBA); 1993-2012 Provincial Statistic Institute; 2013-2014 nominal growth rate adjustment using constant series adjusted by GDP-IPD

Notes: This Table shows the sources used to compile the Current Gross Geographic Product per province. In general we rely on constant series adjusted by GDP-IPD (GDP Deflator), but also we use data from provincial institutes and Ministry of Industry of Argentina.

A.2.4 Provincial Differences

In Table A.4 we can observe the variability in terms of population, development, fiscal structure and political organisation in Argentinian' provinces. For instance, while the province of Buenos Aires concentrates the 38% of the population of the country, Tierra del Fuego only represents 0.36%. In terms of development, the City of Buenos Aires (*Ciudad de Buenos Aires*) and Santa Cruz enjoy a GGP per capita similar to developed nations. However, La Rioja and Formosa show a GGP per capita 7 times smaller than that of Santa Cruz. Formosa and La Rioja reach the lowest levels of Human Development Index (HDI). Furthermore, the preponderance of provincial public sector in GGP for these two jurisdictions is above 63% (72% in the case of Formosa). Clearly, there are substantial differences in terms of development and in fiscal structures.

A.2.5 Political Variables

What we describe as "political variables" includes the composition of both provincial and federal legislatures, and their politic affiliation. Most of the data comes from two sources, Calvo and Escolar (2005) and Tow (2016). However, some discrepancies were found. In such situations, provincial legislatures websites were accessed, even in some cases using "The Wayback Machine"- `http://http://web.archive.org/-`, an archive of old websites. Thus, a full data set was recovered for period 1983-2014.

Table A.4: Summary on Provincial Data

	GGP per capita - U$S dollars*	Share of Total Population	Population (2014)	Own-source revenue to GGP	Total Revenues to GGP (2014)	Own-source revenues per capita-U$S dollars*	Total Revenues per capita -U$S Dollars*	Human Development Index (2011)	Democratic Index (2010)
Buenos Aires	9,903	38%	15,855,846	7%	13%	717	1,327	0.751	3.8
Catamarca	9,213	1%	438,944	6%	36%	531	3,277	0.918	3.3
Chaco	5,254	3%	1,108,584	6%	59%	337	3,118	0.660	3.0
Chubut	15,098	1%	492,415	15%	25%	2,225	3,795	0.644	3.1
Ciudad de Bs. As.	33,569	7%	3,086,692	7%	8%	2,252	2,557	0.771	5.0
Cordoba	8,730	8%	3,515,242	9%	21%	776	1,842	0.778	3.8
Corrientes	4,722	3%	1,081,742	7%	39%	315	1,860	0.626	4.2
Entre Ríos	9,740	3%	1,333,393	6%	24%	624	2,346	0.734	4.0
Formosa	4,792	1%	587,831	5%	67%	224	3,226	0.598	2.9
Jujuy	5,246	2%	738,024	5%	45%	249	2,386	0.745	2.4
La Pampa	5,478	1%	358,487	21%	63%	1,137	3,446	0.841	3.3
La Rioja	4,220	1%	386,230	5%	73%	198	3,080	0.716	2.4
Mendoza	9,390	4%	1,841,650	9%	21%	889	1,998	0.777	4.5
Misiones	7,430	3%	1,181,712	7%	28%	491	2,099	0.690	2.5
Neuquén	15,935	1%	604,060	17%	28%	2,712	4,401	0.768	3.0
Río Negro	6,153	1%	617,769	17%	47%	1,036	2,886	0.806	3.6
Salta	4,762	3%	1,358,422	7%	35%	351	1,673	0.681	2.1
San Juan	5,541	2%	757,567	8%	47%	469	2,606	0.660	3.8
San Luis	7,243	1%	499,894	7%	33%	528	2,407	0.714	2.0
Santa Cruz	34,136	1%	252,102	11%	20%	3,709	6,825	0.807	1.9
Santa Fe	11,410	8%	3,373,159	5%	15%	590	1,749	0.762	4.2
Santiago del Estero	4,597	2%	918,920	5%	52%	222	2,387	0.600	1.9
Tierra del Fuego	16,463	0.359%	151,276	17%	40%	2,866	6,631	0.810	3.2
Tucumán	5,265	4%	1,587,523	10%	38%	512	1,999	0.758	3.2
Total Country	9,962		42,127,484					0.750	3.2
Source	Own estimations		INDEC Census 2010	Own estimations				UNDP**	Gervasoni (2009)

*Official exchange rate in 2014. ** United Nations Development Program (Programa de las Naciones Unidas para el Desarrollo, 2013)
Notes: This Table displays a summary on compiled provincial data. Population is adjusted using Census variation between 2001 and 2010.

A.3 Testing Cox Model Assumptions

In this section, we perform a wide range of tests on the assumptions on which the Cox model is based. Following procedures recommended by Box-Steffensmeier and colleagues (Box-Steffensmeier and Jones, 2004; Box-Steffensmeier and Zorn, 2001), we determine the most appropriate specification and then explore the important issue of the proportional hazards assumption. To make this section more readable, we identify specification by the numbers in Table A.5.

A.3.1 Model Selection

In what follows, we use a combination of tools to select the most appropriate model. They include the Wald test for joint significance of certain parameters, the link test for misspecification, and two subsections on analysis of Cox residuals and multicollinearity.

From the initial model (1) in Table A.5, we gradually incorporate new variables and test for joint significance of their parameters. As we can observe, the inclusion of political, economic and fiscal covariates in Model 2 and growth variables in Model 4 is validated by the Wald test. On the contrary, interactions among FTSA per capita, GGP per capita and Executive Constraints fail to reject the Null Hypothesis that their parameters are zero (Model 3). With this guidance, we use the link test to get an overall picture of general issues with the model. As Cleves et al. (2004) point out, the link test is a powerful tool for detection of misspecification in this context. Thus, by fitting the squared linear predictor and testing whether or not its coefficient is significant, the test finds no issues with Models 1, 2 and 4. Similarly, based on the log-likelihood function with a correction for the number of variables implemented, we see in Table A.5 that the lowest values for the Akaike's information criterion (AIC) and for the Bayesian information criterion (BIC) are related to the first specification, although model 2 and 4 are close in terms of AIC values. Consequently, we proceed only with these three models.

A.3.1.1 Residuals and Diagnostic Measures

The functional form of covariates is an important issue. Two widely used tools are implemented here, the analysis of both Martingale and Cox-Snell residuals (see Box-Steffensmeier and Jones (2004)). In Figure A.1, we explore four relevant variables of the model: FTSA per capita, GGP per capita, Executive Constraints and Adjusted Malapportionment. As we can observe, it is difficult to detect non-linearity for the variables by visual inspection. Similarly, the Cox-Snell residual allow us to study the goodness of fit of the model. If Cox regression model fits the data, then the true cumulative hazard conditional on the covariate vector has an exponential distribution with a hazard rate of 1 (Cleves et al., 2004). In Figure A.2 we can observe these residuals for the three selected specifications in Table A.5. Overall, Models 1 and 4 show better fit (some variability about the 45 degrees line is to be expected, especially in the right hand tail, as a consequence of censored observations).

Using the previous three models (1, 2 and 4) we test for the presence of influential val-

Table A.5: Model Specification Analysis

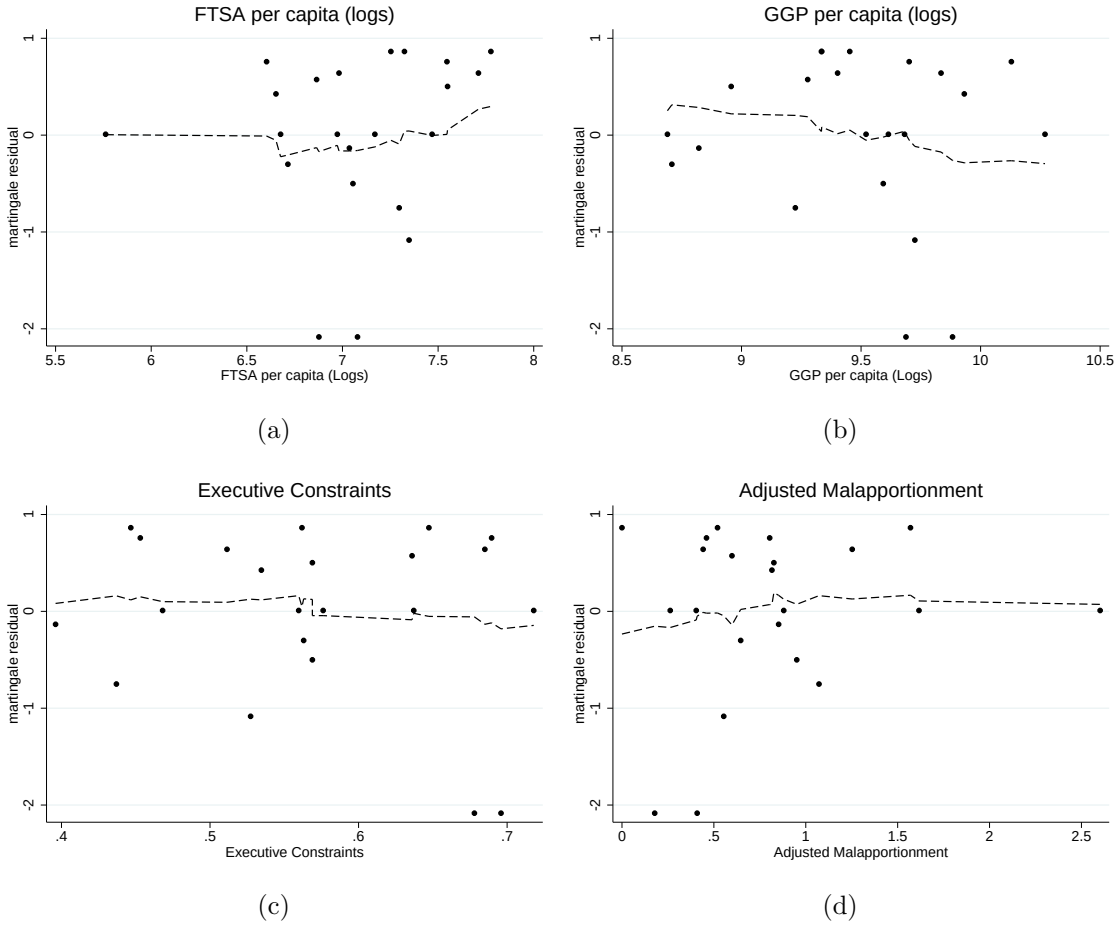
	(1)	(2)	(3)	(4)
FTSA per capita (Logs)	1.173^{+}	2.898^{++}	2.983^{++}	3.050^{+}
	(0.610)	(1.406)	(1.398)	(1.649)
GGP per capita (Logs)	-0.150	3.280^{+}	3.115^{++}	3.561^{++}
	(0.428)	(1.705)	(1.363)	(1.623)
Executive Constraints	-5.267	-9.739^{++}	-9.677^{++}	-11.12^{+++}
	(3.203)	(3.967)	(4.916)	(4.304)
Adjusted Malapportionment		-1.741^{+}	-1.389	-1.917^{+}
		(0.919)	(1.056)	(1.087)
Party Coincidence with President		0.315	0.397	0.229
		(0.429)	(0.465)	(0.429)
Human Development Index (HDI) Ranking		0.125	0.119^{+}	0.142^{+}
		(0.0781)	(0.0694)	(0.0803)
Discretionary Transfers pc (Logs)		0.933	0.996	0.653
		(0.618)	(0.679)	(0.683)
Total revenues per capita		-2.636^{+}	-2.776^{+}	-2.446^{+}
		(1.472)	(1.439)	(1.345)
FTSA per capita (Logs)(*) × GGP per capita (Logs)(*)			-1.676	
			(2.051)	
FTSA per capita (Logs)(*) × Executive Constraints(*)			2.265	
			(10.59)	
GGP per capita (Logs)(*) × Executive Constraints(*)			8.214	
			(9.454)	
Growth FTSA pc $(t-1)$				-7.675
				(4.756)
Growth difference GGP vs GDP $(t-1)$				9.219^{++}
				(4.566)
Growth GGP pc $(t-1)$				-9.555
				(7.307)
Growth discretionary transfers pc $(t-1)$				0.498
				(0.464)
Growth total revenues pc $(t-1)$				-0.659
				(3.685)
Observations	237	236	236	235
No. of subjects	22	22	22	22
No. of failures	20	20	20	20
Pseudo R^2	0.075	0.167	0.186	0.202
Wald test for joint significance $(Prob > \chi^2)$*		0.003	0.637	0.048
Akaike's information criterion (AIC)	94.9	96.0	100.2	102.5
Bayesian information criterion (BIC)	105.3	123.7	138.3	147.5

Standard errors adjusted by provincial clusters in parentheses.

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

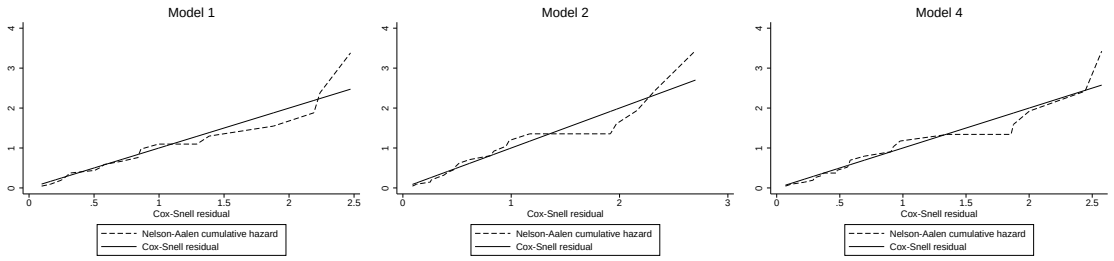
Notes: This Table shows a detailed disaggregation of specifications in Table 1.5. We estimate the effect of FTSA per capita (in logs) on the likelihood of relaxing term limits using the Cox Model. For simplicity, we use provinces as subjects of failure, but analysis can easily be extended to governors. The new additions to this table are some tests for model selection such as the Wald test, AIC and BIC. *The Wald test runs on added variables with respect to the previous specification. In Model 2, the Null Hypothesis (NH) is ($\beta_{AM} = \beta_{PCP} = \beta_{HDI} = \beta_{DT} = \beta_{TR} = 0$), where AM stands for Adjusted Malapportionment variable, PCP is for Party Coincidence with President, HDI for Human Development Index (HDI) Ranking, DT is for Discretionary Transfers pc (Logs) variable and TR is for Total revenues per capita. Similarly, in Model 3, the NH is ($\beta_{FTSA_GGP} = \beta_{FTSA_EC} = \beta_{GGP_EC} = 0$) for the parameters of interacting variables $FTSA$ FTSA per capita (Logs), GGP GGP per capita (Logs) and EC Executive Constraints. Finally, Model 4 tests the joint significance of ($\beta_{g\_FTSA} = \beta_{g\_GGPvsGDP} = \beta_{g\_GGP} = \beta_{g\_DT} = \beta_{g\_TR} = 0$) for parameters of variables g_FTSA growth FTSA pc $(t-1)$, $g\_GGPvsGDP$ growth difference GGP vs GDP $(t-1)$, and g_GGP growth GGP pc $(t-1)$, g_DT for growth of Discretionary Transfers $(t-1)$, and g_TR for growth of Total Revenues $(t-1)$.

Figure A.1: Martingale Residuals



Notes: These Figures plot the Martingale residuals on four relevant variables; FTSA per capita, GGP per capita, Executive Constraints and Adjusted Malapportionment. We would expect to observe no special distribution of residuals.

Figure A.2: Goodness of Fit and Cox-Snell Residuals



(a) (b) (c)

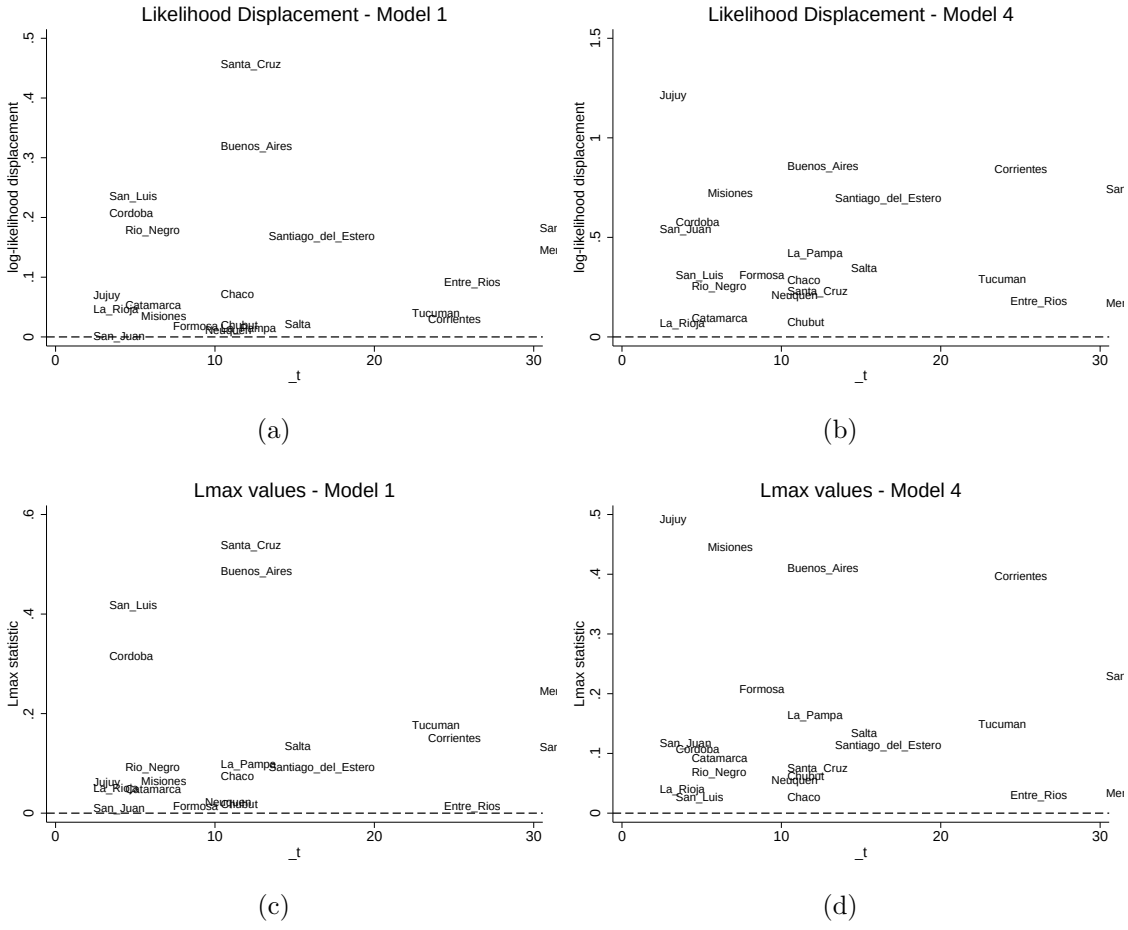
Notes: These Figures display the Cox-Snell residuals. The residuals should follow the 45 degrees line (an exponential distribution with hazard rate of 1), although some variability is expected at the tails. Models 1 and 4 closely follow this pattern compared to Model 3.

ues and outliers. For that exercise, and following Box-Steffensmeier and Jones (2004), we start by inspecting disproportionate influence on parameters of covariates (dfbeta Stata command), and the typical measures of influence; the likelihood displacement values (ldisplace Stata command) and LMAX values (Lmax Stata command). By using dfbeta we find there is no province consistently influencing parameters. Nonetheless, Buenos Aires, Santa Cruz and Jujuy seems to be poorly predicted jurisdictions. For instance, if I remove Jujuy from the dataset, the likelihood of Model 4 improves 12% (-33.6 vs -38.2). However, given the reduced number of provinces, and given that the effects of the covariates and its significance (FTSA per capita significance drops to 12.6%) is not substantially affected, we have decided to keep this province in the analysis. It is worth mentioning that in light of Park and Hendry (2015) recommendations, special attention is given to the proportional hazard assumption and the effect of the inclusion of Jujuy, Buenos Aires and Santa Cruz.

A.3.1.2 Multicollinearity

One way of approaching the issue of multicollinearity is by studying the correlation matrix of coefficients in the Cox Model. Using Model 4, the most comprehensive specification, we find no evidence of high correlation among potentially problematic variables. For fiscal variables for instance, FTSA per capita (Logs) shows -0.32 correlation with Total revenues per capita and -0.29 with Discretionary Transfers, while the correlation between the latter two is -0.51. Political variables are also of concern as normally there is coincidence in the day of provincial and national elections. However, Executive Constraints and Adjusted Malapportionment exhibit 0.70 correlation. Lastly, as I mentioned before, HDI Ranking uses among its score determinants an estimation of GGP per capita, so it is natural to expect some correlation. However, since the ranking is constant for some years (until there is a new calculation; every four or six years), and it comes from different sources, we can rule out some potential problem of multicollinearity. Nonetheless, the correlation coefficient for GGP per capita and HDI Ranking is about 0.73, one of the higher correlated values. Multicollinearity does not seem to be an issue in this sample.

Figure A.3: Outliers in Models 1 and 4



Notes: These Figures present both the log-likelihood displacement and the Lmax-statistics applied to Models 1 and 4 to detect outliers. The provinces of Buenos Aires, Santa Cruz and Jujuy seem to be poorly predicted in models. This analysis is relevant when studying the proportional-hazards assumption.

A.3.2 Testing the Proportional-hazards Assumption

Finally, one of the most important assumptions when using Cox model is the proportionality of the hazard. Although there is not an unique way of verifying this assumption, before testing for non-proportionality, good econometric practice recommends checking for specification errors (and correct them) (Keele, 2010), and for influential observations (Park and Hendry, 2015). Since we have already done that in the previous subsections, the next step is to use Schoenfeld residuals test for proportional hazards. A violation of this assumption will imply coefficient bias and powerless significance tests (Box-Steffensmeier and Jones, 2004; Box-Steffensmeier and Zorn, 2001). For Models 1 and 4, the global test for proportionality finds no evidence of violation of the assumption[5]. However, for Model 2, some problems are detected. It fails the general test for proportionality and the individual Harrel's rho reveals some issues with FTSA per capita, GGP per capita and Adjusted Malapportionment.

There is not a clear recommendation on how to proceed in this circumstance. One option is to re-estimate Model 2 including the interaction of the three offending variables, FTSA per capita (Logs), GGP per capita (Logs), and Adjusted Malapportionment, with time (log(t)). When running this specification, we find jointly significance of these variables interacted with time. The point estimates are altered but not their sign or its significance (results not shown). Another option is to calculate Model 2 but without the outliers; La Rioja, Buenos Aires and Santa Cruz. For that matter, we run three new models (see Table A.6), each time omitting one different jurisdiction. Buenos Aires seems to be the province affecting the most the non-proportionality assumption, since when it is excluded the problem is partially solved[6]. Buenos Aires is undoubtedly an special jurisdiction within the sample: It is the most densely populated province (it conglomerates 38% of total country population), and it concentrates a great proportion of country's GDP. But most importantly, the province receives a lower share of Federal Transfers than it would have been determined based on population or any other indicator.

In terms of our preferred model, it is known that the proportional Schoenfeld residuals test for proportional hazard is sensible to misspecification or outliers (Keele, 2010; Park and Hendry, 2015). It seems to be the case here, and we have detected some problems with Model 2. These problems are partially amended either by excluding Buenos Aires or by interacting offending variables with time. Importantly though, the qualitative effects and significance of our variables of interest (FTSA per capita, GGP per capita and Executive Constraints) are not affected by this corrections. Even more, Model 1 and 4 satisfy proportional hazard assumption. For that reason, we have decided to work with Models 1 and 4, but keeping in mind potential issues with Model 2.

[5]Here, following Park and Hendry (2015), I have used rank of analysis time as the time-scaling function. It is worth mentioning that results are not affected by the time-scale specification chosen.

[6]General proportional test is passed but fails individually for FTSA per capita and Adjusted Malapportionment.

Table A.6: Controlling for Outliers

	(1)	(2)	(3)
FTSA per capita (Logs)	2.537	3.193^{++}	3.768^{+++}
	(1.708)	(1.354)	(1.099)
GGP per capita (Logs)	2.791	3.909^{+++}	3.771^{++}
	(1.715)	(1.390)	(1.870)
Executive Constraints	-11.11^{+++}	-10.53^{++}	-9.950^{++}
	(4.090)	(4.393)	(4.482)
Adjusted Malapportionment	-2.102^{++}	-0.982	-2.042^{++}
	(0.967)	(1.454)	(0.978)
Party Coincidence with President	0.200	0.510	0.224
	(0.477)	(0.453)	(0.507)
Human Development Index (HDI) Ranking	0.0848	0.134^{+}	0.147
	(0.0654)	(0.0683)	(0.0960)
Discretionary Transfers pc (Logs)	1.387^{++}	0.920	1.090
	(0.596)	(0.673)	(0.680)
Total revenues per capita	-2.741^{+}	-2.827^{+}	-2.985^{+}
	(1.458)	(1.509)	(1.671)
Observations	234	226	227
No. of subjects	21	21	21
No. of failures	19	19	19
Omitted outlier	Jujuy	Santa Cruz	Buenos Aires
Pseudo R^2	0.199	0.195	0.209

Standard errors adjusted for provincial clusters in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table includes re-estimations of previous specifications but excluding potential outliers. We first omit Jujuy, then Santa Cruz and finally Buenos Aires. The effect of FTSA per capita in the likelihood of reform remains positive and significant (except when we exclude Jujuy). It is worth mentioning that some of this loss of significance is expected due to reduced cross-sectional variation.

A.4 Time-series Cross-section Data with Binary Dependent Variable

In this section, we explore different alternatives for studying time-series cross-section data with binary dependent variable (BTSCS) Discrete time survival analysis can easily be adapted to fit this purpose[7]. We can define the probability of an event occurrence as $\Pr(y_{it} = 1) = \lambda_i$, and the probability of non-occurrence as $\Pr(y_{it} = 0) = 1 - \lambda_i$, then we can describe it as a function of covariates as follows:

$$\lambda_{it} = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + ... + \beta_k x_{ki} \tag{A.2}$$

We can adapt equation (A.2) to commonly used functions. One of them is the logit specification, which defines λ_i in terms of the log-odds ratio of the probability of an event occurrence to the probability of a non-occurrence.

$$\log(\frac{\lambda_i}{1-\lambda_i}) = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + ... + \beta_k x_{ki}$$

We are assuming that time baseline hazard is constant ($\hat{\lambda_i} = h_0(t) = \exp(\beta_0)$). If we would like to account for duration dependence, we can easily modify the model either by including time dummies or by transforming the values of the duration time (log transformation or polynomials)[8]. Following Allison and Christakis (2006), a general logistic

[7] In fact, it is identical to grouped duration data (Beck et al., 1998). Following Box-Steffensmeier and Jones (2004), the first thing to notice is that the probability of an event occurring at time t_i is,

$$f(t) = \Pr(T = t_i)$$

The survivor function for a discrete random variable T is given by,

$$S(t) = \Pr(T \geq t_i) = \sum_{j \geq i} f(t_j)$$

Where j denotes a failure time. Consequently, it can be shown that the hazard rate for discrete time case is,

$$h(t) = \frac{f(t)}{S(t)} = \Pr(T = t_i | T \geq t_i) \tag{A.1}$$

Working out the likelihood of the previous function, we get the same standard likelihood as for a binary dependent variable (in which the data is organised as individual-period data). We can include time-varying covariates to the hazard rate (A.1) for discrete time by treating the probability of failure as conditional on survival as well as covariates ($\Pr(T = t_i | T \geq t_i, x_{it})$).

[8] Actually, following Beck et al. (1998), if we depart from a continuous time Cox proportional hazard model as

$$h_i(t) = h_0(t) \exp(\beta x_{it})$$

Given that the baseline hazard for the Cox model is unspecified, we can treat the integral of the baseline as an unknown constant ($\alpha_{t_k} = \int_{t_{k-1}} h_0(\tau) d\tau$) and ($\kappa_{t_k} = \log(\alpha_{t_k})$). Modifying the index time we get

$$\Pr(y_{it} = 1) = 1 - \exp(-e^{\beta x_{it_k} + \kappa_{t_k}})$$

That is exactly a binary dependent variable with a Complementary log-log (Cloglog) link (A link function is a mathematical formulation of the probability of an event for binary response models). From there we can similarly get the logit link. The main message here is that the distinction between continuous time process and a purely discrete time analysis is not so clear-cut in practice.

model can be specified as:

$$\log(\frac{\lambda_{it}}{1-\lambda_{it}}) = \alpha_i + \gamma_t + \beta x_{it} \tag{A.3}$$

Where α_i captures time-invariant effect, and more often than not non-measurable characteristics of individuals (provinces in our analysis), γ_t represents an unspecified dependence on time, and x_{it} are time-varying covariates. Estimating the previous model by maximum likelihood we can eliminate parameter $\alpha_i' s$ from the estimating equations. The likelihood function takes the following form:

$$L = \Pi_i(\frac{\exp(\gamma_t + \beta x_{it})}{\Sigma_i \exp(\gamma_t + \beta x_{it})}) \tag{A.4}$$

A few things are worth mentioning with respect to the previous specification, also known as "conditional logistic regression"[9]. First, it only runs on those individuals (provinces) that experienced variation in the dependent variable. It means that we are only left with those jurisdictions that reformed the Constitution. In our working sample we are left with 20 out 22 provinces that reformed. We are inevitably losing precision in our estimates. Secondly, the term γ_t could be problematic and the conditional likelihood will not converge if the model includes any covariate that is function of time[10]. This is a major limitation to the fixed effect logit.

If we are willing to make assumptions related to the effect of time, specifically if we assume no dependence on time at all, $\gamma_t = 0$, then we can consistently obtain estimators of β without making any assumption on the relation of α_i and x_{it}. This is a suitable property, and we are going to trade that assumption either with some parametrization of time or with some specification on the distribution of α_i (random effect analysis).

[9]If we had repeated spells per individual, equation (A.4) can be calculated using the stratified partial likelihood for a Cox proportional hazards model, using software packages that allow for stratification. This estimator would have suitable properties (see Allison (1996) for instance). However, it is common to came across data-sets with once-for-all-failure type.

[10]Given the structure of the data, the events (or failures) always occur at the end. Therefore, any monotonic function of time will perfectly predict the event (Allison and Christakis, 2006). This problem is also known as Complete Separation.

A.5 Conditional Logit (Fixed Effects Logit) and Robustness Checks

In this section we explore the Conditional Logit as an alternative to the LPM and the Cox Model. By using the conditional logit specification we can obtain consistent, asymptotically normal estimators of β without any assumption on the distribution $D(\alpha_i|x_i)$. It is important to notice that the FE logit estimator $\hat{\beta}$, also known as Conditional Maximum likelihood estimator (CMLE), gives us the effect of each element of x_t on the log-odds ratio. We cannot estimate the partial effect on the response probabilities unless we plug in a value for α_i. In Table A.7 we replicate the same specifications as in Table 1.5, this time only for provinces to simplify presentation. FTSA per capita remains positive and highly significant across the 6 different specifications.

One interesting comparison can be done contrasting these results with the Cox model. First of all, the point estimate for FTSA per capita is larger in the FE logit model. This is a result of the combined effect of dropping two provinces from the sample, and the fact that we are measuring different odds ratios, in this case provincial specific. Another important observation is that main variables are not significant in most of the specifications. Within variation seems to vanish all marginal effect of the covariates selected.

Finally, in Table A.8 we repeat the alternatives discussed in the Cox model section. We include royalties, shorter periods of time and different failure events. We observe some slight modifications on results compared to Table 1.6, not in sign but in significance levels (including royalties does indeed reduce power of FTSA per capita, and there is no correlation to passing a Law calling for reform). However, the other two alternatives preserve significance. Even more, this overall reduction in explanation power can be due to working with a reduced number of units (only those who reformed).

Table A.7: Conditional Logit Applied to Provinces, Reformed Term Limits

	(1)	(2)	(3)	(4)	(5)	(6)
FTSA per capita (Logs)	1.653^{+++}	2.771^{+++}	5.070^{+++}	2.703^{++}	4.203^{+++}	5.919^{++}
	(0.590)	(0.870)	(1.740)	(1.180)	(1.429)	(2.362)
GGP per capita (Logs)	-0.0946	0.816	-0.899	-0.319	-0.344	-1.847
	(2.360)	(2.809)	(3.786)	(2.561)	(3.083)	(4.407)
Executive Constraints	-11.51	-9.671	-10.61	-8.422	-5.146	-7.335
	(7.449)	(7.546)	(7.291)	(8.261)	(7.367)	(7.449)
FTSA per capita (Logs)(*) × GGP per capita (Logs)(*)				2.247	2.665	0.326
				(2.557)	(2.576)	(3.191)
FTSA per capita (Logs)(*) × Executive Constraints(*)				-18.81	-20.74	-13.32
				(12.85)	(12.65)	(13.22)
GGP per capita (Logs)(*) × Executive Constraints(*)				5.275	7.979	9.507
				(15.85)	(16.36)	(18.20)
Control Covariates		Yes	Yes		Yes	Yes
Growth Covariates			Yes			Yes
Nr. of Subjects	20	20	20	20	20	20
Nr. of Failures	20	20	20	20	20	20
Observations	197	196	192	197	196	192

(*) Mean centred variables.

Standard errors adjusted for 22 clusters in provinces. $^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table displays an alternative binary dependent variable estimation. We use the Conditional Logit, also known as the fixed effects logit, to assess the impact of FTSA per capita (in logs) on the probability of relaxing term limits. We gradually include Control Covariates (*Discretionary Transfers pc (Logs), Total revenues per capita (Logs), Adjusted Malapportionment, Party coincidence with President, Human Development Index (HDI) Ranking*), and Growth Covariates (*Growth FTSA pc* $(t-1)$*, Growth difference GGP vs GDP* $(t-1)$*, Growth GGP pc* $(t-1)$*, Growth discretionary transfers pc* $(t-1)$*, Growth total revenues pc* $(t-1)$.). The positive impact of FTSA per capita is significant across the six models.

Table A.8: Exploring Alternatives, Conditional Logit

	Including Royalties		Before 1994	Different failure event	
	(1)	(2)	(3)	(4(*))	(5(**))
FTSA per capita (Logs)	24.89		2.069^{+}	2.494^{++}	0.947
	(17.16)		(1.202)	(1.111)	(1.245)
FTSA + royalties per capita (Logs)	-23.39	0.704			
	(16.94)	(0.865)			
GGP per capita (Logs)	2.449	0.271	-0.482	0.0681	0.621
	(2.109)	(3.011)	(4.046)	(3.475)	(3.727)
Executive Constraints	-8.625	-10.73	-1.193	-2.640	-29.57^{+++}
	(11.43)	(7.269)	(13.39)	(13.19)	(10.74)
Adjusted Malapportionment	0.148	0.0700	-2.216	-2.412	-2.989
	(1.235)	(1.440)	(1.677)	(1.648)	(2.283)
Party Coincidence with President	1.911	1.285	0.655	0.879	0.732
	(1.215)	(0.964)	(1.137)	(0.927)	(0.871)
Human Development Index (HDI) Ranking	-0.176	-0.121	-0.0753	-0.156	-0.0227
	(0.158)	(0.109)	(0.739)	(0.197)	(0.180)
Discretionary Transfers pc (Logs)	-0.0341	-0.0286	0.535	0.560	-0.897^{++}
	(0.491)	(0.367)	(0.539)	(0.447)	(0.379)
Total revenues per capita	2.617	0.0145	-6.282	-4.600	2.388
	(3.864)	(2.789)	(4.055)	(3.312)	(3.114)
Nr. of Subjects	20	20	15	20	20
Nr. of Failures	20	20	15	20	20
Observations	196	196	105	146	165
Pseudo R^2	0.305	0.111	0.162	0.143	0.311

Standard errors clustered by provinces.

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Notes: This Table presents replications of the alternatives used in the Cox Model section, but using the Conditional Logit. They include accounting for Royalties, reducing the period of analysis before 1994, and using two competing events; constitutional reforms and provincial call for reform. We gradually include Control Covariates (*Discretionary Transfers pc (Logs), Total revenues per capita (Logs), Adjusted Malapportionment, Party coincidence with President, Human Development Index (HDI) Ranking*), and Growth Covariates (*Growth FTSA pc* $(t-1)$*, Growth difference GGP vs GDP* $(t-1)$*, Growth GGP pc* $(t-1)$*, Growth discretionary transfers pc* $(t-1)$*, Growth total revenues pc* $(t-1)$.). Although some significance is lost in these specifications, the positive effect is observed across the five models. Furthermore, in models 3 and 4, the partial effect of FTSA per capita is significant.

Appendix B

Appendix Chapter 2

B.1 Collected Data Set

The multiple sources of municipal data are described in this Appendix. As a summary, we relied primary on municipal authorities when possible, but secondary sources, such as provincial organisms, were also immensely useful. The data collection process involved a wide variety of different sources. A detailed account of them can be found in Table B.1. In some provinces, municipal fiscal data was compiled either by provincial organisms or by the provincial audit office (*Tribunal de Cuentas Provincial*). Examples of the latter were Entre Rios and Mendoza, providing access to comprehensive municipal fiscal datasets. In Neuquen, local government statistics were collected and published by the Provincial Direction of Statistics. Similarly, for municipalities in Chubut, the Provincial Council for Fiscal Responsibility annually publishes municipal budgets. In Buenos Aires, the provincial government produces annual reports on its municipalities. By using supra-municipal sources, fiscal information on 294 local governments, in 5 provinces, was collected. Unfortunately, the remaining provinces did not offer open access to data sets.

The other portion of data was individually collected from municipal-specific sources. A thorough search was performed for the entire set of municipalities bigger than 10.000. This process was organised in two stages. As a first step, web scraping involved navigating through official web pages either from municipalities, from local legislative councils, or from the municipal audit office (if there was any). In general, the degree of transparency was extremely poor. When possible, *executed* budget information was recovered. In the absence of this, more accessible budget data was used[1][2]. As a second step, in a

[1] In some cases, even though we have labelled data as budget info, it consisted of a corrected estimation of the final executed budget, presented at some point of the fiscal year. This is rather normal as municipalities are required to present quarterly executed budgets, and projections of final budget are normally included in these reports. This constitutes a closer projection of the data. There is another important aspect related to the accuracy of this data, and it connected to budget modifications. For legal purposes, in order to modify municipal budgets, revenues estimations should be achieved within the fiscal period. Thus, if revenues were projected to increase then it implies that municipal authorities expected to accomplish this objective in that period.

[2] In some exceptional cases, only data for budget 2009 was recovered. We decided to dismiss such data on the grounds of it being biased. This was the first period under which the influx of funds hit

more direct approach, emails and phone calls were made. In some exceptional cases, such as local governments in Formosa or Chaco, the effort was more notorious. For these municipalities, letters were posted. Less cost effective, budgets on particularly non-transparent municipalities were collected in this way. This effort was done in order to alleviate concerns on municipal selection. It is important to mention a key web resource, the "The Wayback Machine"[3], a digital library with billions of stored web pages, which allowed us to recover data from deleted or unused old websites.

Because of the numerous sources used, it comes as no surprise some overlap in the data. Given the panel structure, in order to avoid unnecessary jumps in the series simply resulting from changes in sources, we prioritised time continuity within the local government. In Mendoza for instance, data on provincial/federal transfers (and royalties) and OSRs come from two different sources in order to favour time continuity of the data. Nonetheless, when possible, consistency of the data was achieved by drawing all variables from the same single data source.

In some cases, preserving time continuity of some variables become at odds with using single data sources. Behind these overlaps lurks the inconsistent registration of resources across municipalities, especially notorious when dealing with FFS funds and Royalties. For instance, FFS funds were registered either as capital revenue or as current revenue with equal chance. In one jurisdiction Royalties were registered as OSRs. In such cases, correction was made by dropping values on aggregated variables. Two simple collapsing restrictions were implemented; first, that the sum of OSRs and Provincial/Federal Transfers should not exceed Total Current Revenues. Secondly, Total Current Revenues should not be greater than Total Revenues.

Finally, Provincial Gross Geographic Product (GGP) information was borrowed from Chapter 1 dataset.

municipalities. Given that budgets are prepared in advance, between October and December of the previous year, the information for 2009 will be specially misleading for that year. By doing this, we dismissed data for 29 municipalities in 2009. This effect was especially important for Villa Mercedes, San Luis, where pre and post treatment effect involved budget data 2009. By deleting 2009, variation in that jurisdiction was lost.

[3] `http://http://web.archive.org/`.

Table B.1: Municipal Sources

Province	Municipalities in sample	Main Source	Secondary Sources
Buenos Aires	135	RAFAM - Sistema de Información Municipal Consolidada (SIMCo - https://www.simco.rafam.ec.gba.gov.ar/); Subsecretaría de Política y Coordinación Económica- Dirección Provincial de Coordinación Municipal (https://www.gba.gob.ar/economia/direccion_provincial_de_coordinacion_municipal_y_programas_de_desarrollo/transferencias_municipios)	Municipal Websites
Catamarca	1	Municipal sources accessed through phone calls and emails	Municipal Websites, phone calls, emails and letters to the provincial audit office (*Tribunal de Cuentas Provincial*)
Chaco	2	Phone calls, letters and emails	Municipal Websites
Chubut	27	Concejo Provincial Responsabilidad Fiscal- Gobierno de Chubut (http://www.chubut.gov.ar/portal/wp-organismos/cprf/)	Municipal Websites
Cordoba	19	Municipal Websites	Phone calls and emails
Corrientes	3	Municipal Websites	Phone calls and emails
Entre Rios	78	Provincial Audit Office (*Tribunal de Cuentas Provincial*)- Accessed through phone calls	Municipal sources, phone calls and emails
Formosa	2	Municipal Websites	Phone calls and emails
Jujuy	3	Municipal Websites	Phone calls, emails and formal applications
La Pampa	3	Municipal sources accessed through phone calls and emails	Municipal Websites
La Rioja	1	Municipal Websites	Phone calls and emails
Mendoza	18	Ley de Responsabilidad Fiscal - Tribunal de Cuentas Mendoza (http://app.tribunaldecuentas.mendoza.gov.ar/leyrespfiscal/Home.php); Presupuesto Provincial - Ministerio de Hacienda Provincia de Mendoza (http://www.hacienda.mendoza.gov.ar/presupuesto-2/)	Municipal Websites
Misiones	3	Municipal Websites	Phone calls, emails and formal applications
Neuquen	36	Dirección Provincial de Estadística y Censos, Provincia de Neuquen (http://www.estadisticaneuquen.gob.ar/index.php?sec=panel_publicaciones_IMB); Coordinación Provincial de Relaciones Fiscales con Municipios - Subsecretaría de Ingresos Públicos - Ministerio de Economía e Infraestructura de la Provincia del Neuquén (https://www.economianqn.gob.ar/municipios/contenido/transferencias)	Municipal Websites
Rio Negro	5	Municipal sources accessed through phone calls, emails and letters	Municipal Websites
Salta	15	Municipal Websites	Phone calls and emails
San Juan	3	Municipal Websites	Phone calls and emails
San Luis	49	Municipal sources accessed through phone calls, emails and letters; budget data for smaller municipalities in Provincial Legislature	Municipal Websites
Santa Cruz	3	Municipal Websites	Phone calls and emails
Santa Fe	16	Municipal Websites	Phone calls and emails
Santiago del Estero	2	Municipal sources accessed through phone calls, emails and letters	Municipal Websites
Tierra del Fuego	2	Municipal sources accessed through phone calls, emails and letters	Municipal Websites
Tucuman	1	Municipal sources accessed through phone calls, emails	Municipal Websites

Notes: This Table shows a detailed account of the municipal sources used in this dataset. In most cases, more than two sources were used, but it has been grouped in "Secondary Sources". Websites last accessed (October 2019).

Sample Control: Municipal Socio-economic Structure: In this Appendix, we use data from 2010 National Census of Population, Households, and Housing, to compare the distribution of three groups of variables between our sample and the entire set of municipalities. These variables are; Human Capital (considering Unsatisfied Basic Needs[4], and Education), Municipal Services (access to sewerage and water from piped network), Property Characteristics (overcrowded dwellings and irregular properties). These three dimensions can potentially affect municipal revenues.

Table B.2 displays selected variables means for both the sample and the entire population of municipalities. In Panel A, the working database containing 426 municipalities[5] is contrasted with the 2,227 governments for which there is Census data. I run a t-test for mean differences with unequal group variance. Overall, local governments in our sample have better human capital, show superior access to basic services and have better property characteristics. In Panel B, only municipalities greater than 10,000 habitants are considered. The most notorious effect is that all these mean differences are reduced. Nonetheless, it is worth mentioning that the panel structure of the database should account for all these structural differences.

[4]In Argentina, INDEC considers a household as having UBN if it meets one of the following characteristics:

- Households with more than three persons per room (overcrowding);
- Households that live in housing of unsuitable type;
- Households with no kind of toilet.
- Households with children of school age not attending school (lack of access to basic education);
- Households with four or more persons per employed member and whose household's head is low level education (less than second grade of primary education).

[5]Two municipalities were "created" after 2010: Lezama in Buenos Aires and Plottier in Neuquen.

Table B.2: Mean Differences for Local Governments in Sample

	Total		In Sample			
	Mean	n	Mean	n	Mean difference	Std. Error
Panel A: Total Sample and Population						
Dimension a: Human Capital in Local Governments						
Percentage with -at least one- UBN	0.128	2,227	0.093	426	0.034^{+++}	0.003
Percentage with reading and writing comprehension	0.912	2,227	0.925	426	-0.012^{+++}	0.001
Percentage on higher degree education*	0.093	2,227	0.131	426	-0.038^{+++}	0.003
Dimension b: Municipal Services						
Percentage connected to sewerage system	0.170	2,227	0.473	426	-0.303^{+++}	0.016
Percentage connected to regulated water piped network	0.692	2,227	0.851	426	-0.158^{+++}	0.010
Dimension c: Property Characteristics						
Percentage living in regular properties**	0.930	2,227	0.958	426	-0.027^{+++}	0.003
Percentage of overcrowded dwellings***	0.051	2,227	0.042	426	0.009^{+++}	0.001
Panel B: Municipalities greater than 10,000 hab.						
Dimension a: Human Capital in Local Governments						
Percentage with -at least one- UBN	0.108	459	0.080	257	0.028^{+++}	0.004
Percentage with reading and writing comprehension	0.921	459	0.932	257	0.010^{+++}	0.001
Percentage on higher degree education*	0.138	459	0.154	257	-0.015^{+++}	0.004
Dimension b: Municipal Services						
Percentage connected to sewerage system	0.437	459	0.551	257	-0.113^{+++}	0.021
Percentage connected to regulated water piped network	0.834	459	0.840	257	-0.006	0.015
Dimension c: Property Characteristics						
Percentage living in regular properties**	0.949	459	0.964	257	-0.014^{+++}	0.003
Percentage of overcrowded dwellings***	0.048	459	0.037	257	0.010^{+++}	0.002

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Source: National Institute of Statistics and Censuses (INDEC, in its Spanish acronym) National Census of Population, Households, and Housing 2010, and Collected Data Set.

Notes: This table compares total local governments in Argentina with in sample municipalities in the collected database. A two-sample t-test with equal variances is run to compare means for both groups across four dimensions of the data; Human Capital, Municipal Services, Property Characteristics, and Fiscal Structure.

* Whether the individual is taking or has taken superior education.

** Flats and houses.

*** More than 3 individuals per room.

B.2 Using a Different Measure of Windfall Intensity

In this Appendix, it is shown that even though different classifications of winners and losers can be chosen, there is in general coincidence on the provinces that benefit the most (and not) from current FTSA. For that purpose, in Table B.3 we add two proposals, one by Porto (2004) and the other by Vega et al. (2016). These alternatives shares try to comply with the constitutional mandate, and at the same time be feasible given the political constraints. Departing from actual coefficients, Porto (2004) gradually adjusts only by population, in a lapse of ten years. The City of Buenos Aires keeps 1.4% but it is detracted from secondary distribution. In practice this implies a reduction for this jurisdiction, since in the current regime the City obtains 1.4% of the common pool of resources[6]. In the work by Vega et al. (2016), two alternative proposals are studied. On the one hand, coefficients are estimated accounting for the comprehensive impact of the federal government, meaning that federal transfers and expenditures are included. On the other hand, the second proposal includes variables such as Population (65%), Development Gap (15%), Unsatisfied Basic Needs (10%), and a measure of Fiscal Responsibility (10%). This last indicator is novel in the sense of encouraging fiscal effort[7]. This is the proposal we include in the Table.

Table B.4 groups repeated winners and losers across the three alternatives. They are highlighted in bold letters. There are many provinces that obtained an advantageous position thanks to the FFS being distributed using the FTSA. In contrast, Buenos Aires and Chubut are the only two provinces on where there is coincidence of being the losers of the actual scheme. Furthermore, in the tails of the distribution, deviated more than 5% from each alternative, Buenos Aires is the only repeated jurisdiction. Regarding winners, the clear winners are Formosa, Catamarca, San Juan and Chaco (obtained more than 5% according to the three specifications). We give an important weight to the political and institutional voice in selecting the adequate alternative, for that reason, in the main body of analysis we only use deviations from Law 20,221.

[6] In December 2015, this 1.4% was increased by the Federal Government to 3.6%. Provinces obtain a percentage of the 57.7% of that common pool.

[7] It measures the ratio of current revenues to current expenditures, the proportion of personal expenditures in total expenditure, and provincial fiscal surplus.

Table B.3: Deviations from the Optimal, Alternative Proposals

	Coefficients				Deviation		
Province	Distribution FFS	Law 20,221*	Porto (2004)	Vega et al. (2016)	Law 20,221	Porto (2004)	Vega et al. (2016)
Buenos Aires	0.212	0.269	0.280	0.268	**-21%**	**-24%**	**-21%**
Catamarca	0.027	0.019	0.020	0.019	43%	33%	40%
Chaco	0.048	0.040	0.039	0.034	21%	23%	42%
Chubut	0.015	0.018	0.016	0.020	**-15%**	**-5%**	**-24%**
Córdoba	0.086	0.085	0.088	0.064	1%	**-3%**	34%
Corrientes	0.036	0.036	0.031	0.032	**-1%**	16%	12%
Entre Ríos	0.047	0.044	0.040	0.033	7%	18%	43%
Formosa	0.035	0.022	0.026	0.025	60%	35%	41%
Jujuy	0.027	0.021	0.025	0.025	30%	10%	10%
La Pampa	0.018	0.017	0.018	0.017	5%	1%	7%
La Rioja	0.020	0.017	0.021	0.019	20%	**-5%**	5%
Mendoza	0.040	0.045	0.039	0.041	**-11%**	3%	**-2%**
Misiones	0.032	0.028	0.033	0.033	12%	**-3%**	**-3%**
Neuquén	0.017	0.016	0.016	0.023	1%	5%	**-27%**
Rio Negro	0.024	0.022	0.021	0.023	10%	16%	6%
Salta	0.037	0.036	0.034	0.036	3%	9%	3%
San Juan	0.033	0.025	0.026	0.024	33%	25%	36%
San Luis	0.022	0.017	0.019	0.021	30%	16%	5%
Santa Cruz	0.015	0.014	0.016	0.018	10%	**-5%**	**-15%**
Santa Fe	0.086	0.087	0.090	0.064	**-1%**	**-4%**	35%
Santiago del Estero	0.040	0.039	0.035	0.030	3%	14%	33%
Tierra del Fuego	0.012	0.004	0.010	0.016	200%	19%	**-26%**
Tucumán	0.046	0.044	0.042	0.037	5%	9%	24%
City of Buenos Aires (CAB.A.)	0.024	0.036	0.014	0.078	**-33%**	70%	**-70%**
Total Provinces + CAB.A.	1	1	1	1			

Note: This Table proposes two additional coefficient distributions. Porto (2004) gradually corrects, in a lapse of ten years, by population. Vega et al. (2016) consider Population (65%), Development Human Index (15%), Unsatisfied Basic Needs (10%), and a measure of Fiscal Responsibility (10%). Coefficients in Law 20,221 from 1973 were formed in 25% by development gap (Development Human Index), 10% by demographic dispersion, and 65% by population.

Table B.4: Coincidences

	Neutral +/- 0%		Neutral +/- 5%			Neutral +/- 10%			Neutral +/- 15%		
	Winners	Losers	Winners	Losers	Neutral	Winners	Losers	Neutral	Winners	Losers	Neutral
Law 20,221 in 1973	Tierra del Fuego	Santa Fe	Tierra del Fuego	Mendoza	La Pampa	Tierra del Fuego	Mendoza	Entre Ríos	Tierra del Fuego	**Buenos Aires**	**Misiones**
	Formosa	Corrientes	**Formosa**	Chubut	Santiago del Estero	**Formosa**	Chubut	Tucumán	**Formosa**	CAB.A.	Santa Cruz
	Catamarca	Mendoza	**Catamarca**	**Buenos Aires**	Salta	**Catamarca**	**Buenos Aires**	**La Pampa**	**Catamarca**		Rio Negro
	San Juan	**Chubut**	**San Juan**	CAB.A.	Neuquén	**San Juan**	CAB.A.	Santiago del Estero	**San Juan**		Entre Ríos
	San Luis	**Buenos Aires**	**San Luis**		Córdoba	San Luis		**Salta**	San Luis		Tucumán
	Jujuy	CAB.A.	**Jujuy**		Santa Fe	Jujuy		Neuquén	Jujuy		**La Pampa**
	Chaco		**Chaco**		Corrientes	**Chaco**		Córdoba	**Chaco**		Santiago del Estero
	La Rioja		La Rioja			La Rioja		Santa Fe	La Rioja		**Salta**
	Misiones		Misiones			Misiones		Corrientes			Neuquén
	Santa Cruz		Santa Cruz			Santa Cruz					Córdoba
	Rio Negro		**Rio Negro**			Rio Negro					Santa Fe
	Entre Ríos		**Entre Ríos**								Corrientes
	Tucumán		**Tucumán**								**Mendoza**
	La Pampa										Chubut
	Santiago del Estero										
	Salta										
	Neuquén										
	Córdoba										
Porto (2004)	CAB.A.	Córdoba	CAB.A.	**Buenos Aires**	Neuquén	CAB.A.	**Buenos Aires**	Jujuy	CAB.A.	**Buenos Aires**	Santiago del Estero
	Formosa	Misiones	**Formosa**		Mendoza	**Formosa**		Tucumán	**Formosa**		Jujuy
	Catamarca	Santa Fe	**Catamarca**		La Pampa	**Catamarca**		**Salta**	**Catamarca**		Tucumán
	San Juan	Santa Cruz	**San Juan**		Córdoba	**San Juan**		Neuquén	**San Juan**		**Salta**
	Chaco	La Rioja	**Chaco**		Misiones	**Chaco**		Mendoza	**Chaco**		Neuquén
	Tierra del Fuego	**Chubut**	Tierra del Fuego		Santa Fe	Tierra del Fuego		**La Pampa**	Tierra del Fuego		**Mendoza**
	Entre Ríos	**Buenos Aires**	**Entre Ríos**		Santa Cruz	Entre Ríos		Córdoba	Entre Ríos		**La Pampa**
	San Luis		**San Luis**		La Rioja	San Luis		Misiones	San Luis		Córdoba
	Corrientes		Corrientes		Chubut	Corrientes		Santa Fe	Corrientes		**Misiones**
	Rio Negro		**Rio Negro**			Rio Negro		Santa Cruz	Rio Negro		Santa Fe
	Santiago del Estero		Santiago del Estero			Santiago del Estero		La Rioja			Santa Cruz
	Jujuy		**Jujuy**					Chubut			La Rioja
	Tucumán		**Tucumán**								Chubut
	Salta		Salta								
	Neuquén										
	Mendoza										
	La Pampa										
Vega et al. (2016)	**Entre Ríos**	Mendoza	**Entre Ríos**	Santa Cruz	Salta	Entre Ríos	Santa Cruz	Jujuy	Entre Ríos	Santa Cruz	Corrientes
	Chaco	Misiones	**Chaco**	**Buenos Aires**	Mendoza	**Chaco**	**Buenos Aires**	**La Pampa**	**Chaco**	**Buenos Aires**	Jujuy
	Formosa	Santa Cruz	**Formosa**	Chubut	Misiones	**Formosa**	Chubut	Rio Negro	**Formosa**	Chubut	**La Pampa**
	Catamarca	**Buenos Aires**	**Catamarca**	Tierra del Fuego		**Catamarca**	Tierra del Fuego	La Rioja	**Catamarca**	Tierra del Fuego	Rio Negro
	San Juan	**Chubut**	**San Juan**	Neuquén		**San Juan**	Neuquén	San Luis	**San Juan**	Neuquén	La Rioja
	Santa Fe	Tierra del Fuego	Santa Fe	CAB.A.		Santa Fe	CAB.A.	**Salta**	Santa Fe	CAB.A.	San Luis
	Córdoba	Neuquén	Córdoba			Córdoba		Mendoza	Córdoba		**Salta**
	Santiago del Estero	CAB.A.	Santiago del Estero			Santiago del Estero		Misiones	Santiago del Estero		**Mendoza**
	Tucumán		**Tucumán**			Tucumán			Tucumán		**Misiones**
	Corrientes		Corrientes			Corrientes					
	Jujuy		**Jujuy**								
	La Pampa		La Pampa								
	Rio Negro		**Rio Negro**								
	La Rioja		La Rioja								
	San Luis		**San Luis**								
	Salta										

Note: This Table highlights in bold letters provinces on which there is coincidence across the three alternative distributions of federal funds. Each column considers as neutral if the province is not deviated more than 0%, 5%, 10% and 15% respectively.

B.3 Pre-trends Analysis and No Anticipatory Behaviour

In this Appendix, we examine two crucial assumptions for the use of event case diff-in-diff, the parallel trends assumptions and no anticipatory behaviour. As a consequence of having a continuous policy variable, Windfall Intensity (W_k), to get clean figures for parallel trends we have grouped W_k variable by quartiles. Quartile 1 (Q1) contains revenue data on municipalities in 6 provinces[8] that sit in the Top 25% of FFS distribution by Law design. Similarly, Quartile 4 accounts for the Bottom 25% of FFS distribution[9]. As can be seen from Figure B.1, pre-2009 behaviour of revenues followed a similar path for top and bottom quartiles. After 2009, following the linear fit line, we can see that for Contributions on Property and Total Revenues a divergence can be noticed. But while Total Revenues recovered at a faster rate, revenue collection from property has moved at sluggish pace.

A more rigorous and widely used method is the dynamic two-way FE regression (Autor, 2003; Abraham and Sun, 2018). The main goal of this model is to assess the prevalence of time effects before the introduction of FFS in 2009. The following regression is estimated,

$$T_{ikt} = \alpha_0 + \sum_{t=T-3}^{T+3} \alpha_t (W_k * D_t) + \mu_i + v_t + \varepsilon_{ikt} \tag{B.1}$$

Pre-FFS windfall intensity (W_k) is interacted with the set of time dummies (D_t). What we are looking here is a differential behaviour of revenues before 2009, captured by the interaction term of year dummies and W_k. Figure B.2 displays the results for our four main sources of municipal revenues. We use a seven year window from 2006 to 2012 ($T-3 = 2006$ and $T+3 = 2012$)[10]. Using confidence intervals, the figures show that these effects are essentially no different from zero.

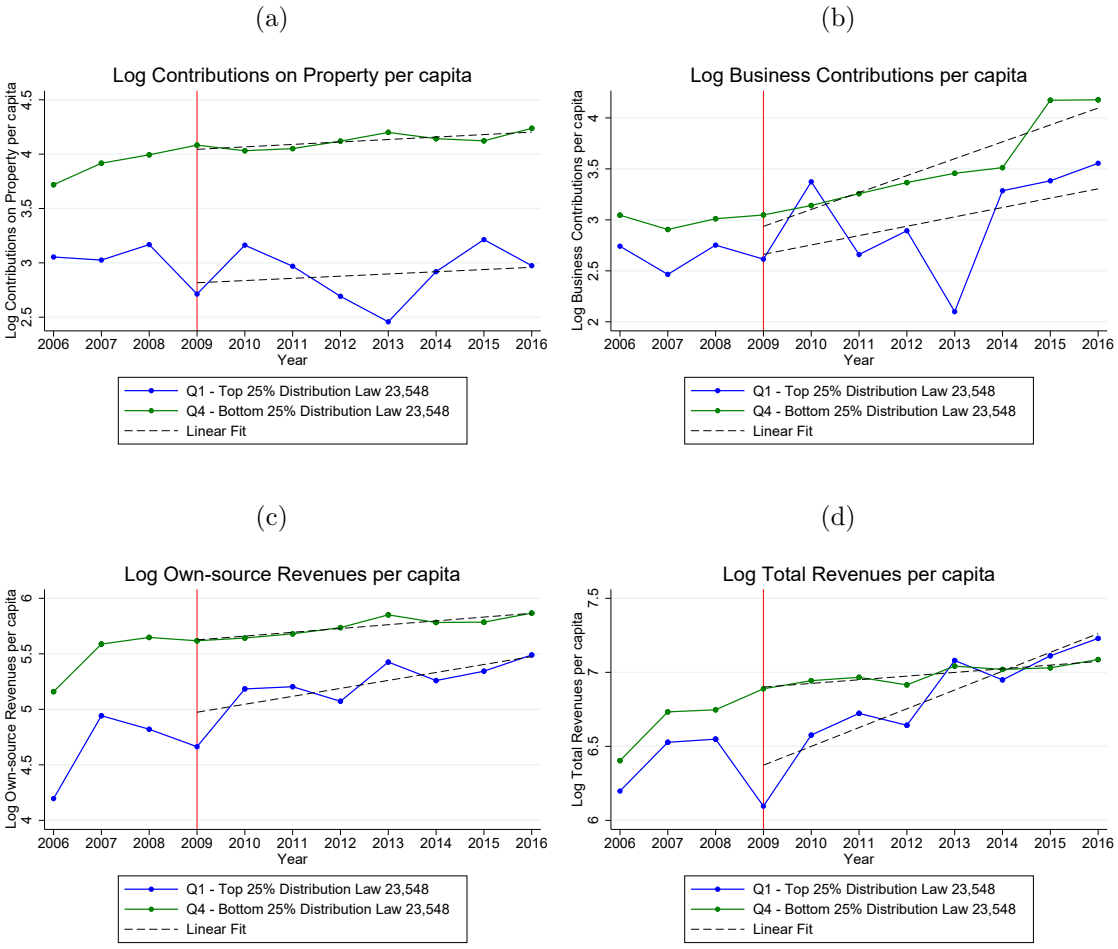
Overall, these results point to similar behaviour of tax revenues in municipalities before the FFS application. If we combine this with no anticipatory assumption, we can build an argument for the differential impact of FFS in municipalities winners of this system.

[8] These provinces received 29.4% more of what they would have obtained were Law 20,221 still in place. These provinces are Catamarca, Formosa, Jujuy, San Juan, San Luis, and Tierra del Fuego (see Table 2.5)

[9] Provinces of Buenos Aires, Chubut, Cordoba, Corrientes, Mendoza and Santa Fe are included in Q4.

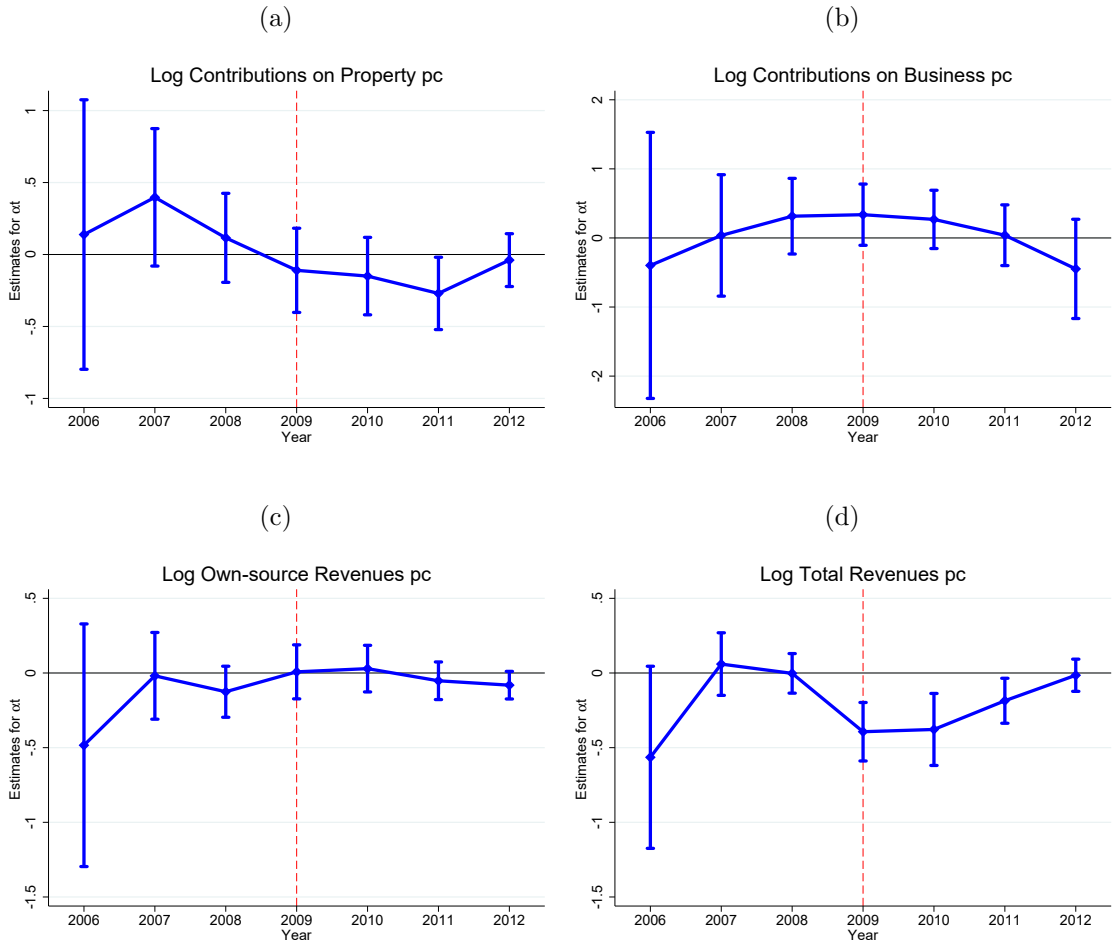
[10] Due to multicollinearity it is common practise to reduce the period under analysis (Abraham and Sun, 2018)

Figure B.1: Pre Trends Analysis, Top and Bottom 25% Distribution FFS



Note: These Figures show pre and post windfall trends. Municipalities located in provinces defined as disproportionate winners and losers are grouped (top and bottom 25% of the distribution), and revenues are portrayed.

Figure B.2: Lead and Lags Analysis



Note: These Figures display lead and lags following specification in Model (B.1). The windfall intensity variable (W_k) is interacted with year dummies and the point estimates are plotted (with 95% confidence intervals).

B.4 Robustness Analysis

As discussed above, FFS funding reduced Contributions on Property on municipalities where the influx of funds was more notorious. In this Appendix, we turn to check how robust these findings are to a number of alterations. Unless stated otherwise, we depart from our baseline estimation, municipalities with population greater than 10,000 and (semi)balanced panel, and gradually check for different specifications. The most relevant result of this section is that findings are quite consistent and robust across different models.

Unbalanced Panel for Municipalities with Incomplete Revenues: First, as a consequence of having an unbalanced panel, data on Contributions on Property is scarcer than that of OSRs or Total Revenues. We re-run Equation (2.19) but for all available data. Table B.5 illustrates that the full dataset shows an increase in municipal OSRs revenues after the windfall. The change is in the region of 2.27% and 2.61% for every extra 10% increase in windfall intensity. Nonetheless, through a number of falsification tests in the following subsections, we can disregard this finding as a phenomenon starting before 2009 (see placebo tests section). If the database is restricted only to those municipalities where data Contributions on Property is available, there is no significant increase in OSRs after 2009, and this result does not depend on the addition of covariates.

Placebo or Falsification Tests 2007 and 2008: Following the same logic, we re-estimate Equation (2.19) simulating the year that they received treatment to be either 2007 or 2008. We do not expect to find alteration in the coefficients. As observed in Panel A and B in Table B.6, for Contributions on Property, there is no significant change after 2007, and only at 10% significance level after 2008. It is worth mentioning that latter result is sensible to the population threshold, and significance is lost when using smaller municipalities. Based on OSRs results, the significance levels on both panels suggest there was a positive trend in place before 2009. For falsification tests for years after 2009 placebo test would be invalid, as the windfall will be already in operation.

Smaller Municipalities: The database contains information for population in municipalities ranging from 50 (*El Talita - San Luis*) to 1,775,816 (*La Matanza - Buenos Aires*). One wonders whether the urban size will have an impact on revenue collection. As the urban sprawl grows, so it does the tax base. At the same time, the complexity of the tax administration can become cumbersome and influence total revenues per capita. In Panels C and D in Table B.6, we relax the population threshold including municipalities of more than 5,000 habitants or the entire sample. While the significance levels drop in Panel D, main findings are not altered. For the reasons discussed in Section 2.3.4, on theoretical and empirical grounds, a lower bound of population threshold is preferred.

Control for Municipalities in Provinces that Altered the Provincial Regime when Received FFS: As we mentioned in Section 2.3.3.1, three provinces altered their provincial regime to transfer FFS to their municipalities. It can be problematic as it challenges our exogenous source of variation in funding due to Federal Law 23,548.

Table B.5: Unrestricted Sample: Impact of 2009 Windfall on Municipal Revenues, 2006 - 2015

Panel A: No Control Covariates				
	(1) Log Own-source Revenues pc	(2) Log Contributions on Property pc	(3) Log Contributions on Business pc	(4) Log Total Revenues pc
Windfall Intensity (logs) × POST	0.227^{+++}	-0.338^{+++}	-0.144	-0.142^{+++}
	(0.0821)	(0.126)	(0.241)	(0.0542)
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1796	1500	1314	1752
Number of municipal clusters	238	212	194	251
Panel B: Control Covariates				
	(5) Log Own-source Revenues pc	(6) Log Contributions on Property pc	(7) Log Contributions on Business pc	(8) Log Total Revenues pc
Windfall Intensity (logs) × POST	0.261^{+++}	-0.501^{++}	-0.137	-0.0419
	(0.0829)	(0.237)	(0.255)	(0.0448)
Log Provincial GGP pc	-0.414^{++}	0.772	0.150	-0.315^{++}
	(0.188)	(0.771)	(0.592)	(0.131)
Log Automatic Transfers pc	-0.0461	-0.0340	0.140	0.447^{+++}
	(0.0703)	(0.210)	(0.307)	(0.0626)
Municipal FE	Yes	Yes	Yes	Yes
Observations	1683	1432	1265	1554
Number of municipal clusters	236	209	191	235

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Note: This Table presents Model (2.19) but using the entire unbalanced panel.

In order to assess this, Table B.7 compares 4 different model specifications; first excluding these provinces one at the time, and then in Panel H simultaneously excluding the three of them. Findings signal that results do indeed improve in significance and retain coefficient effect.

Including Provincial Fixed Effects: In Panel I in Table B.8 I include Provincial Fixed Effects. Significance levels are not altered by this modification.

Executed Budget Data: In Section 2.3.2 we discussed that there were two main sources and types of collected data. Executed budget was used when possible, but sometimes we had to do only with budget data estimations. Budgets are normally presented in October and run from January to December. We do not have any evidence that these budget estimations are differentially affecting my controls and treatments. However, given the unexpected application of the Federal Solidarity Fund in 2009, budget estimations for that year will be particularly imprecise. Therefore, we got rid of those observations (34). In this robustness check we control by only using Executed data. As observed in Panel J, main findings are not affected by this, although there is an important reduction in the number of observations.

Similar Tax Bases; Property Tax and Turnover Tax: Some municipalities tax properties and businesses in several ways (see Section 2.3.1). In this check, we estimate whether results are modified by adding similar sources of revenues. This poses the complexity that the great majority of municipalities do not collect Property Tax, therefore logs biases the sample (by not including 0). In order to tackle that, I combine both types of taxes and then apply logs. Similar considerations are done for Turnover Tax, as municipalities in Chubut are the only local governments that can collect this revenue. Figure B.3 compares the behaviour of these two alternative sources of municipal revenues. The direction and significance of results is hardly altered (I am using 95% Confidence Intervals).

Alternative Windfall Intensity Variable; Per Capita Disparities in 2009: In this robustness check, we test if results are affected by the definition of Windfall Intensity. We substitute this source of heterogeneous treatment for per capita influx of funds in 2009 at the provincial level. In Panel K in Table B.8 we can observe that results only change in quantitative values but not in their significance level.

Treatment and Controls: Top 25% vs Bottom 25%: Finally, and similarly to the analysis in Section B.3, in this robustness check, we restrict the database to compare municipalities in provinces at the Top 25% of the distribution of FFS, compared to the Bottom 25%. Panel L in Table B.8 shows that the effects of reduction in Contributions on Property are stronger at the tails of the distribution.

Table B.6: Robustness Checks A

Panel A: Falsification Test 2007				
	(1)	(2)	(3)	(4)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST 2007	0.586^{+}	0.00761	0.327	0.427^{+}
	(0.310)	(0.520)	(1.090)	(0.256)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1447	1432	1265	1339
Number of municipal clusters	207	209	191	206
Panel B: Falsification Test 2008				
	(5)	(6)	(7)	(8)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST 2008	0.0699	-0.542^{+}	0.0911	-0.0605
	(0.156)	(0.310)	(0.409)	(0.0707)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1447	1432	1265	1339
Number of municipal clusters	207	209	191	206
Panel C: Population ≥ 5,000				
	(9)	(10)	(11)	(12)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.0212	-0.253^{+}	-0.0924	-0.117^{++}
	(0.0844)	(0.145)	(0.236)	(0.0567)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1741	1691	1392	1578
Number of municipal clusters	236	235	205	235
Panel D: No Population Threshold				
	(13)	(14)	(15)	(16)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.166^{+}	-0.148	-0.0942	0.0121
	(0.0917)	(0.131)	(0.237)	(0.0643)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	2264	2047	1424	1905
Number of municipal clusters	298	278	209	293

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Table B.7: Robustness Checks B

Panel E: Excluding Chubut Province				
	(17)	(18)	(19)	(20)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.101	-0.350^{+++}	-0.136	-0.161^{+++}
	(0.0845)	(0.125)	(0.240)	(0.0583)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1456	1481	1295	1334
Number of municipal clusters	203	209	191	202
Panel F: Excluding Neuquen Province				
	(21)	(22)	(23)	(24)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.0872	-0.342^{+++}	-0.194	-0.154^{+++}
	(0.0853)	(0.127)	(0.247)	(0.0576)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1503	1486	1300	1382
Number of municipal clusters	205	208	190	204
Panel G: Excluding Salta Province				
	(25)	(26)	(27)	(28)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.0670	-0.352^{+++}	-0.144	-0.154^{++}
	(0.0839)	(0.124)	(0.241)	(0.0598)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1494	1478	1303	1372
Number of municipal clusters	201	204	189	200
Panel H: Excluding Simultaneously				
	(29)	(30)	(31)	(32)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.0639	-0.369^{+++}	-0.187	-0.191^{+++}
	(0.0829)	(0.123)	(0.246)	(0.0567)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1421	1445	1270	1300
Number of municipal clusters	191	197	182	190

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

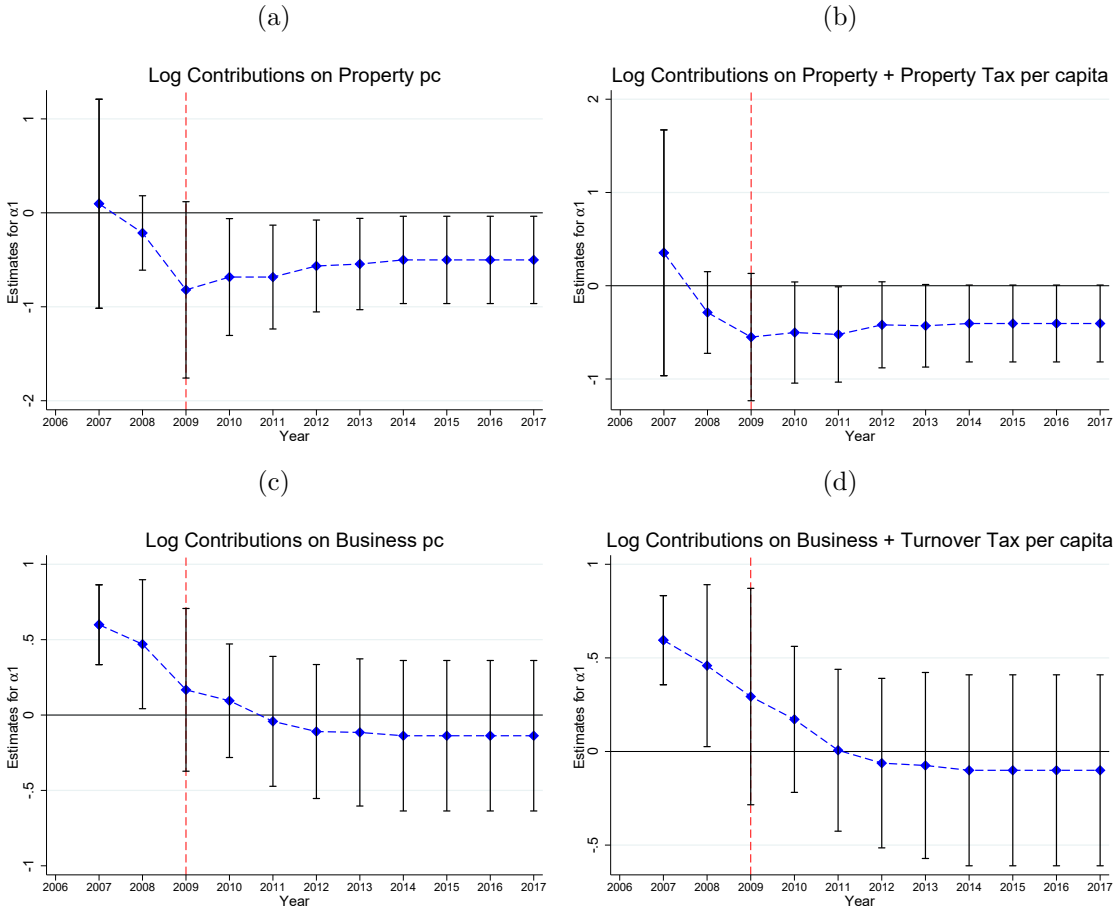
Table B.8: Robustness Checks C

Panel I: Provincial Fixed Effects				
	(33)	(34)	(35)	(36)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.0947	-0.338^{+++}	-0.144	-0.137^{++}
	(0.0852)	(0.126)	(0.241)	(0.0600)
Control Covariates	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1516	1500	1314	1394
Number of municipal clusters	209	212	194	208
Panel J: Only Executed Budget Data				
	(37)	(38)	(39)	(40)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Windfall Intensity (logs) × POST	0.0620	-0.250^{+}	-0.0505	-0.205^{+++}
	(0.111)	(0.144)	(0.370)	(0.0719)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1401	1387	1204	1279
Number of municipal clusters	190	192	173	190
Panel K: Alternative Windfall Measure				
	(41)	(42)	(43)	(44)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Per Capita Windfall (logs) × POST	0.0476	-0.143^{++}	-0.0993	-0.0770^{+++}
	(0.0325)	(0.0585)	(0.0922)	(0.0269)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1516	1500	1314	1394
Number of municipal clusters	209	212	194	208
Panel L: Treatment Q1 vs Control Q4				
	(41)	(42)	(43)	(44)
	Log Own-source Revenues pc	Log Contributions on Property pc	Log Contributions on Business pc	Log Total Revenues pc
Treated (Q1) × POST	0.0368	-0.216^{+++}	0.261	-0.0393
	(0.116)	(0.0721)	(0.208)	(0.0642)
Control Covariates	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1222	1207	1202	1216
Number of municipal clusters	164	168	169	163

Robust standard errors in parentheses

$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Figure B.3: Post Windfall Revenue Behaviour. Adding Property Tax and Turnover Tax



Note: These Figures compare post-windfall behaviour of four municipal revenues as in Model (2.19). Coincident patterns are observed when similar tax bases are used, in this case, when Property Tax and Turnover Tax.

Appendix C

Appendix Chapter 3

C.1 Municipal Charters in Argentina

The dataset of Municipal Charters draws mainly on Atela and Caputo (2018). However, some discrepancies were found and cleaned. This was the result of accessing the official documents using three main websites, which have uploaded a great number of MC;

- Website 1: Lideres Municipales[1]
- Website 2: Gobiernos Locales[2]
- Website 3: Fiscal de Mesa[3]

Tables C.1 and C.2 present a detailed account on municipality, year of reform, and the source of information corresponding to the adoption of Municipal Charters.

[1] http://lideresmunicipales.cippec.org/category/cartas-organicas/

[2] http://www.gobiernoslocales.com.ar/cartas-orgnicas-municipales-de-argentina_s-2108.htm

[3] http://web.archive.org/web/20161209191535/http://www.fiscaldemesa.com.ar/cartas-organicas-municipales/ (accessed using WebArchive capture from 9 December 2016.)

Table C.1: Adoption of Municipal Charters

Nr.	Province	Municipality	Year Reform	Source	Nr.	Province	Municipality	Year Reform	Source
1	Catamarca	Andalgala	2005	Atela and Caputo (2018)	45	Corrientes	Caa Cati	2010	Atela and Caputo (2018)
2	Catamarca	Belen	2005	Atela and Caputo (2018)	46	Corrientes	Chavarria	2016	Atela and Caputo (2018)
3	Catamarca	Fray Mamerto Esquiu	2004	Atela and Caputo (2018)	47	Corrientes	Colonia Liebig S	2013	Atela and Caputo (2018)
4	Catamarca	Recreo	1995	Atela and Caputo (2018)	48	Corrientes	Colonia Santa Rosa	2012	Atela and Caputo (2018)
5	Catamarca	San Fernando del Valle de Catamarca	1993	Atela and Caputo (2018)	49	Corrientes	Concepcion	2012	Atela and Caputo (2018)
6	Catamarca	Santa Maria	1995	Atela and Caputo (2018)	50	Corrientes	Corrientes	1994	Atela and Caputo (2018)
7	Catamarca	Tinogasta	2005	Atela and Caputo (2018)	51	Corrientes	Cruz de los Milagros	2012	Atela and Caputo (2018)
8	Catamarca	Valle Viejo	1995	Atela and Caputo (2018)	52	Corrientes	Curuzu Cuatia	1994	Atela and Caputo (2018)
9	Chaco	General San Martin	2012	Atela and Caputo (2018)	53	Corrientes	Empedrado	2010	Atela and Caputo (2018)
10	Chaco	Resistencia	2000	Atela and Caputo (2018)	54	Corrientes	Esquina	1994	Document accesed using website 1
11	Chubut	Comodoro Rivadavia	1999	Atela and Caputo (2018)	55	Corrientes	Felipe Yofre	2012	Atela and Caputo (2018)
12	Chubut	Esquel	2005	Document accesed using website 1	56	Corrientes	Garruchos	2012	Atela and Caputo (2018)
13	Chubut	Puerto Madryn	1994	Document accesed using website 1	57	Corrientes	Gobernador Virasoro	1994	Atela and Caputo (2018)
14	Chubut	Rawson	2005	Atela and Caputo (2018)	58	Corrientes	Goya	2009	Atela and Caputo (2018)
15	Chubut	Trelew	2002	Atela and Caputo (2018)	59	Corrientes	Ita Ibate	2012	Atela and Caputo (2018)
16	Cordoba	Almafuerte	1996	Atela and Caputo (2018)	60	Corrientes	Itati	2010	Atela and Caputo (2018)
17	Cordoba	Alta Gracia	1999	Atela and Caputo (2018)	61	Corrientes	Ituzaingo	2006	Atela and Caputo (2018)
18	Cordoba	Arroyito	1998	Atela and Caputo (2018)	62	Corrientes	La Cruz	2007	Atela and Caputo (2018)
19	Cordoba	Bell Ville	1994	Atela and Caputo (2018)	63	Corrientes	Lavalle	2012	Atela and Caputo (2018)
20	Cordoba	Colonia Caroya	2008	Atela and Caputo (2018)	64	Corrientes	Lomas de Vallejos	2008	Atela and Caputo (2018)
21	Cordoba	Cordoba	1995	Atela and Caputo (2018)	65	Corrientes	Mburucuya	2012	Atela and Caputo (2018)
22	Cordoba	Coronel Moldes	1995	Atela and Caputo (2018)	66	Corrientes	Mercedes	1993	Document accesed using website 1 and 2
23	Cordoba	Corral de Bustos	1995	Atela and Caputo (2018)	67	Corrientes	Mocoreta	2012	Atela and Caputo (2018)
24	Cordoba	Cruz del Eje	2017	Atela and Caputo (2018)	68	Corrientes	Monte Caseros	1994	Atela and Caputo (2018)
25	Cordoba	General Cabrera	1995	Atela and Caputo (2018)	69	Corrientes	Palmar Grande	2012	Atela and Caputo (2018)
26	Cordoba	Hernando	1995	Atela and Caputo (2018)	70	Corrientes	Paso de la Patria	2009	Atela and Caputo (2018)
27	Cordoba	La Falda	1995	Atela and Caputo (2018)	71	Corrientes	Paso de los Libres	1994	Atela and Caputo (2018)
28	Cordoba	Laboulaye	1995	Document accesed using website 3	72	Corrientes	Pedro R. Fernandez	2008	Atela and Caputo (2018)
29	Cordoba	Las Varillas	1995	Atela and Caputo (2018)	73	Corrientes	Perugorria	2012	Atela and Caputo (2018)
30	Cordoba	Marcos Juarez	2004	Atela and Caputo (2018)	74	Corrientes	Ramada Paso	2012	Atela and Caputo (2018)
31	Cordoba	Morteros	1995	Atela and Caputo (2018)	75	Corrientes	Saladas	2006	Atela and Caputo (2018)
32	Cordoba	Rio Ceballos	1995	Atela and Caputo (2018)	76	Corrientes	San Carlos	2012	Atela and Caputo (2018)
33	Cordoba	Rio Cuarto	1996	Atela and Caputo (2018)	77	Corrientes	San Cosme	2009	Atela and Caputo (2018)
34	Cordoba	Rio Tercero	2007	Atela and Caputo (2018)	78	Corrientes	San Luis del Palmar	2008	Atela and Caputo (2018)
35	Cordoba	Villa Allende	1995	Atela and Caputo (2018)	79	Corrientes	San Roque	2015	Atela and Caputo (2018)
36	Cordoba	Villa Carlos Paz	2007	Atela and Caputo (2018)	80	Corrientes	San Antonio	2008	Document accesed using website 3
37	Cordoba	Villa Dolores	1996	Atela and Caputo (2018)	81	Corrientes	Santa Ana	2012	Atela and Caputo (2018)
38	Cordoba	Villa Maria	1996	Atela and Caputo (2018)	82	Corrientes	Santa Lucia	2008	Atela and Caputo (2018)
39	Cordoba	Villa Nueva	1995	Atela and Caputo (2018)	83	Corrientes	Santo Tome	1994	Atela and Caputo (2018)
40	Corrientes	9 de Julio	2012	Atela and Caputo (2018)	84	Corrientes	Sauce	2008	Atela and Caputo (2018)
41	Corrientes	Alvear	1996	Atela and Caputo (2018)	85	Corrientes	Tabay	2010	Atela and Caputo (2018)
42	Corrientes	Bella Vista	1994	Document accesed using website 1	86	Corrientes	Villa Olivari	2008	Atela and Caputo (2018)
43	Corrientes	Beron de Astrada	2011	Atela and Caputo (2018)	87	Corrientes	Yapeyu	2012	Atela and Caputo (2018)
44	Corrientes	Bonpland	2012	Atela and Caputo (2018)	88	Corrientes	Yatayti Calle	2012	Atela and Caputo (2018)

Note: This Table contains the year the municipality dictated its Municipal Charter, sorted by province. Although the main source of the information is Atela and Caputo (2018), multiple sources were accessed to cross-check dissimilarities. Website 1 refers to `http://lideresmunicipales.cippec.org/category/cartas-organicas/`, Website 2 is `http://www.gobiernoslocales.com.ar/cartas-orgnicas-municipales-de-argentina_s-2108.htm`, and Website 3 is `http://web.archive.org/web/20161209191535/http://www.fiscaldemesa.com.ar/cartas-organicas-municipales/` (accessed using WebArchive capture from 9 December 2016.)

Table C.2: Continuation... Adoption of Municipal Charters

Nr.	Province	Municipality	Year Reform	Source	Nr.	Province	Municipality	Year Reform	Source
89	Jujuy	Libertador General San Martin	1988	Atela and Caputo (2018)	134	Rio Negro	Lamarque	1992	Atela and Caputo (2018)
90	Jujuy	Palpala	1988	Atela and Caputo (2018)	135	Rio Negro	Luis Beltran	1991	Atela and Caputo (2018)
91	Jujuy	Perico	1988	Atela and Caputo (2018)	136	Rio Negro	Mainque	1991	Atela and Caputo (2018)
92	Jujuy	San Pedro de Jujuy	1988	Atela and Caputo (2018)	137	Rio Negro	Maquinchao	1990	Atela and Caputo (2018)
93	Jujuy	San Salvador de Jujuy	1988	Atela and Caputo (2018)	138	Rio Negro	Rio Colorado	1990	Atela and Caputo (2018)
94	Misiones	Apostoles	2010	Atela and Caputo (2018)	139	Rio Negro	San Antonio Oeste	1989	Atela and Caputo (2018)
95	Misiones	Aristobulo del Valle	2013	Atela and Caputo (2018)	140	Rio Negro	San Carlos de Bariloche	1986	Atela and Caputo (2018)
96	Misiones	El Soberbio	1990	Atela and Caputo (2018)	141	Rio Negro	Sierra Grande	2006	Atela and Caputo (2018)
97	Misiones	Eldorado	1990	Atela and Caputo (2018)	142	Rio Negro	Valcheta	1991	Atela and Caputo (2018)
98	Misiones	Leandro N. Alem	2001	Atela and Caputo (2018)	143	Rio Negro	Viedma	1989	Atela and Caputo (2018)
99	Misiones	Montecarlo	1994	Atela and Caputo (2018)	144	Rio Negro	Villa Regina	1996	Atela and Caputo (2018)
100	Misiones	Obera	2013	Atela and Caputo (2018)	145	Rio Negro	Comallo	2002	Atela and Caputo (2018)
101	Misiones	Posadas	1988	Atela and Caputo (2018)	146	Rio Negro	Ministro Ramos Mexia	2012	Atela and Caputo (2018)
102	Misiones	Puerto Iguazu	1994	Atela and Caputo (2018)	147	Salta	Aguaray	2016	Atela and Caputo (2018)
103	Misiones	Puerto Rico	2010	Atela and Caputo (2018)	148	Salta	Cafayate	2008	Atela and Caputo (2018)
104	Misiones	San Vicente	2013	Atela and Caputo (2018)	149	Salta	Cerrillos	2008	Atela and Caputo (2018)
105	Neuquen	Centenario	1996	Atela and Caputo (2018)	150	Salta	Colonia Santa Rosa	2008	Atela and Caputo (2018)
106	Neuquen	Chos Malal	1995	Atela and Caputo (2018)	151	Salta	Embarcacion	1989	Atela and Caputo (2018)
107	Neuquen	Cutral Co	1995	Atela and Caputo (2018)	152	Salta	General Guemes	1989	Atela and Caputo (2018)
108	Neuquen	Junin de los Andes	1998	Atela and Caputo (2018)	153	Salta	General Mosconi	1988	Atela and Caputo (2018)
109	Neuquen	Neuquen	1995	Atela and Caputo (2018)	154	Salta	Hipolito Yrigoyen	1989	Atela and Caputo (2018)
110	Neuquen	Plaza Huincul	1988	Atela and Caputo (2018)	155	Salta	Joaquin V Gonzalez	1994	Atela and Caputo (2018)
111	Neuquen	Plottier	1995	Atela and Caputo (2018)	156	Salta	Metan	1989	Atela and Caputo (2018)
112	Neuquen	Rincon de los Sauces	1998	Atela and Caputo (2018)	157	Salta	Pichanal	1994	Atela and Caputo (2018)
113	Neuquen	San Martin de los Andes	1989	Document accesed using website 1	158	Salta	Rosario de la Frontera	1988	Atela and Caputo (2018)
114	Neuquen	San Patricio del Chañar	2004	Atela and Caputo (2018)	159	Salta	Rosario de Lerma	1988	Atela and Caputo (2018)
115	Neuquen	Villa la Angostura	2009	Atela and Caputo (2018)	160	Salta	Salta	1988	Atela and Caputo (2018)
116	Neuquen	Zapala	1994	Atela and Caputo (2018)	161	Salta	San Ramon de la Nueva Oran	1988	Atela and Caputo (2018)
117	Rio Negro	Allen	1989	Atela and Caputo (2018)	162	Salta	Tartagal	1988	Atela and Caputo (2018)
118	Rio Negro	Campo Grande	1998	Atela and Caputo (2018)	163	San Juan	Caucete	2007	Atela and Caputo (2018)
119	Rio Negro	Catriel	1991	Atela and Caputo (2018)	164	San Juan	Chimbas	1992	Atela and Caputo (2018)
120	Rio Negro	Cervantes	2004	Atela and Caputo (2018)	165	San Juan	Pocito	1996	Atela and Caputo (2018)
121	Rio Negro	Chichinales	1991	Atela and Caputo (2018)	166	San Juan	Rawson	2006	Atela and Caputo (2018)
122	Rio Negro	Chimpay	1994	Atela and Caputo (2018)	167	San Juan	Rivadavia	1992	Atela and Caputo (2018)
123	Rio Negro	Choele Choel	1991	Atela and Caputo (2018)	168	San Juan	San Juan	1992	Atela and Caputo (2018)
124	Rio Negro	Cinco Saltos	1991	Atela and Caputo (2018)	169	San Juan	Santa Lucia	1992	Atela and Caputo (2018)
125	Rio Negro	Cipolletti	1987	Document accesed using website 1	170	San Luis	San Luis	1990	Atela and Caputo (2018)
126	Rio Negro	Contralmirante Cordero	1996	Atela and Caputo (2018)	171	San Luis	Villa Mercedes	1990	Atela and Caputo (2018)
127	Rio Negro	Dina Huapi	2013	Atela and Caputo (2018)	172	Santiago del Estero	Añatuya	2007	Atela and Caputo (2018)
128	Rio Negro	El Bolson	1991	Document accesed using website 1	173	Santiago del Estero	Frias	1998	Atela and Caputo (2018)
129	Rio Negro	General Conesa	1990	Atela and Caputo (2018)	174	Santiago del Estero	La Banda	2006	Atela and Caputo (2018)
130	Rio Negro	General Fernandez Oro	1997	Atela and Caputo (2018)	175	Santiago del Estero	Santiago del Estero	1961	Atela and Caputo (2018)
131	Rio Negro	General Roca	1988	Atela and Caputo (2018)	176	Santiago del Estero	Termas de Rio Hondo	1992	Atela and Caputo (2018)
132	Rio Negro	Ingeniero Huergo	1990	Atela and Caputo (2018)	177	Tierra del Fuego	Rio Grande	2006	Atela and Caputo (2018)
133	Rio Negro	Ingeniero Jacobacci	1991	Atela and Caputo (2018)	178	Tierra del Fuego	Ushuaia	2002	Atela and Caputo (2018)

Note: This table is a continuation of the previous table. It contains the year the municipality dictated its Municipal Charter, sorted by province. Although the main source of the information is Atela and Caputo (2018), multiple sources were accessed to cross-check dissimilarities. Website 1 refers to `http://lideresmunicipales.cippec.org/category/cartas-organicas/`, Website 2 is `http://www.gobiernoslocales.com.ar/cartas-orgnicas-municipales-de-argentina_s-2108.htm`, and Website 3 is `http://web.archive.org/web/20161209191535/http://www.fiscaldemesa.com.ar/cartas-organicas-municipales/` (accessed using WebArchive capture from 9 December 2016.)

C.2 Proportional Hazard Assumption

The Proportional Hazard Assumption is an important issue when fitting a Cox model. It refers to the covariates proportionally shifting the hazard and this process being independent of time. When non-proportional hazards are detected, a recommendation is to interact these offending variables with some function of time Box-Steffensmeier and Jones (2004). From the Grambsch and Therneau global proportional test, we obtain that Segregation Indexes and Municipal Population fail the proportional-hazard assumption. For that reason, in the following Table C.3, we show that interacting such variables with time does not affect main conclusions. When these two variables are interacted with time (Panel B), we find that they are not significant. Furthermore, even though coefficients in the main specifications are altered in their quantitative impact, significance is preserved. For that reason, we do not find support in this case for violation of proportional hazard assumption. Thus, in the main body of the chapter we continue to use the baseline specifications.

Table C.3: Proportional Hazard Assumption, Variables Interacted with Time

Dep. Var.: Survival time to Municipal Charter sanction	(1)	(2)	(3)	(4)
Panel A: Main Estimation				
main				
Gini Segregation Index (G)	0.0417^{+++}	0.0289^{++}		
	(0.0105)	(0.0118)		
Information Theory Segregation Index (H)			0.0928^{+++}	0.0573^{+}
			(0.0255)	(0.0295)
Full Set of Covariates	Yes	Yes	Yes	Yes
Provincial Dummies	Yes	Yes	Yes	Yes
Panel B: Variables interacted with time				
Gini Segregation Index (G)	0.000530	0.00109		
	(0.000688)	(0.000785)		
Information Theory Segregation Index (H)			0.000691	0.00185
			(0.00168)	(0.00195)
Full Set of Covariates	Yes	Yes	Yes	Yes
Provincial Dummies	Yes	Yes	Yes	Yes
Nr. of Subjects	401	401	401	401
Nr. of Failures	174	174	174	174
Pseudo R^2	0.133	0.159	0.127	0.151
AIC	1729.3	1690.2	1741.3	1695.9

Robust standard errors in parentheses
$^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, $^{+++}$ $p < 0.01$

Source: National Institute of Statistics and Censuses (INDEC, in its Spanish acronym) National Census of Population, Households, and Housing 2001.

Note: This Table replicates Table 3.4 but including the interaction of offending variables with time. As observed in Panel B, these interactions are not significant, therefore we proceed with baseline specifications.

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