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# Fiscal Centralization and the Political Process\*

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## Abstract

We study the dynamic support for fiscal decentralization in a political agency model from the perspective of a region. We show that corruption opportunities are lower under centralization at each period of time. However, centralization makes more difficult for citizens to detect corrupt incumbents. Thus, corruption is easier under centralization for low levels of political competition. We show that the relative advantage of centralization depends negatively on the quality of the local political class, but it is greater if the center and the region are subject to similar government productivity shocks. When we endogenize the quality of local politicians, we establish a positive link between the development of the private sector and the support for decentralization. Since political support to centralization evolves over time, driven either by economic/political development or by exogenous changes in preferences over public good consumption, it is possible that voters are (rationally) discontent about it. Also, preferences of voters and the politicians about centralization can diverge when political competition is weak.

JEL-Classification:H11, D72, D73, P16

Key-words: decentralization, centralization, political agency, quality of politicians, corruption.

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# 1 Introduction

In many countries the delivery of important public goods is often done by a politically accountable regional government. However, the degree of control over the decision on the level and the type of public goods varies across countries and over time.<sup>1</sup> The aim of this paper is to understand the degree of autonomy over public good provision between central and regional governments and, importantly, to identify mechanisms explaining how this evolves over time or may differ across countries.

This issue of where should the decision and delivery of the public good reside is certainly not a new one in the literature. The traditional trade off basically goes in this way: a decentralized structure will take better account of the preferences of the people but it will impose coordination costs, when there are externalities or scale advantages in the delivery of the public good (Oates, 1972). More recently, the literature on decentralization and corruption posed some additional interesting trade-offs. An argument favoring decentralization is that it is associated with greater accountability (Tomassi and Weinschelbaum, 2007; Seabright, 1996). This argument is stronger if individuals observe the provision of public good in other regions and use this information to evaluate their local politicians (Besley and Case, 1995) and also in the presence of sufficiently strong political competition (Shleifer and Vishny, 1993) or press freedom (Lessmann and Markwardt, 2009). Besides, centralization can generate undesired conflicts of interest between regions if decisions are made

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<sup>1</sup>A recent study by the OECD shows that the degree of decentralization varies greatly across OECD countries. Furthermore, the level of decentralization evolves with no clear pattern and in a non-monotonic fashion. While in the last years, countries like Mexico, Spain and the US have delegated more responsibilities to sub-central administrations, the contrary has occurred in France and Japan (Blöchlinger, 2006). Whereas some countries constantly revise their level decentralization, others, like Germany, delegated decision making to sub-national administrations decades ago. The decentralization process in Latin America is illustrative of an erratic quest for the optimal level of decentralization. Countries, like Argentina and Brazil, initiated a wave of re-centralization in the late nineties, after being the champions of decentralization in the developing world (Eaton and Dickovick, 2008). Arguably, the move toward decentralization may also be associated with the secessionist wave observed in many regions and the formation of new countries around the world. The intensity of these movements also varies over time and across countries (Spolaore, 2008).

by a central legislature which may be reflected in an inefficient and unequal degree of central provision of the public good (Besley and Coate, 2003). These positive features of decentralization may be counterbalanced by a greater danger of corruption and rent seeking associated with the fact that local governments are easier to be captured by local elites (Bardhan and Mookherjee, 2000, 2005, 2006).

The recognition that the delivery of public goods is often done at the regional level by a politically accountable authority implies a new trade off associated with the decision between centralization and decentralization.<sup>2</sup> Given that the delivery of public goods is carried out by regional authorities even when decisions are made by a central government, centralized schemes offer an unexplored advantage. A central authority which determines the public good provision at sub-central levels has an advantage due precisely to the lack of direct control of the local outcomes. Thus, the center can mandate a level/type of public good that is detached from the potentially biased self-interest of sub-central politicians.<sup>3</sup>

But an unexplored disadvantage of centralization emerges once the selection of politicians is considered. If the provision of public good reveals to some extent the type of the local government, centralization makes it more difficult to detect that type. As a consequence, it facilitates the re-election of potentially corrupt incumbents. Hence a tradeoff may arise, as centralization can reduce temptations to the local politicians at the expense of reducing the capacity of elections to select better politicians. We add to this trade off the classical disadvantage of centralized regimes. That is, central authorities make worse informed decision than local politicians and therefore they impose a provision of public goods that is less well tailored to the local interests. The

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<sup>2</sup>In various countries local authorities are responsible for the provision of public good. This seems to be independent on whether the decisions are centralized. France is a good example combining centralized decisions with decentralized execution.

<sup>3</sup>We can avoid thus the assumption of that politicians of the central government are more altruistic (as in Blanchard and Shleifer (2001) or more talented, as stated by John Stuart Mill more than a century ago in the following way: “*the local representative bodies and their officers are almost certain to be of a much lower grade of intelligence and knowledge, than Parliament and the national executive*” (quotation taken from Treisman (2002)).

workings of this augmented trade off become nontrivial and interesting once embedded it in a dynamic analysis of the political process.

Our analysis rests on the following premises:

- We consider a situation where two levels of government, the center and the region, can potentially take decisions over the provision of public good and we compare two main different fiscal schemes. These schemes differ in who decides the level of provision, and, thereby, the payoff consequences of those decisions.
- The center and the region suffer from productivity shocks that affect the government capacity to provide public goods. The realizations of these shocks are private information for each government. The occurrence of these shocks in the center and the region is imperfectly correlated. This implies that the central government can decide a sub-optimal level of public good from the regional perspective.
- Under centralization, a central agency decides the level of public good to be provided in the region, taxes accordingly and delegates the implementation of public good provision to local politicians (variations to this form of centralization are also discussed). Local politicians have private information about the actual cost of delivering this good (different states of the world would determine different optimal levels of provision). How they use this informational advantage depends on their type, the political process and the level of fiscal autonomy. We consider two types of local politicians, those motivated by ego/pride-rents (and hence honest, in this model) and those materially motivated (which in this model can lead to dishonesty).

Since the states of nature in the center and the region may differ, the center may make inappropriate decisions for the region. When his signal is that the state of nature is good (costs are low), the center mandates a high level of public good. When the signal is that the state of nature is bad (costs are high), the mandate is to provide a low level of public

good. When the signals are mismatched with the true state of the nature, local politicians must either have insufficient funds to meet the central requirements or receive excessive taxation for their needs, which they can pocket (if dishonest) or use as a signal of honesty in order to be re-elected.

- Under decentralization, decisions are taken by the local government. In this case, honest local politicians provide the socially optimal amount of the good, at the appropriate cost. The dishonest local politicians always pretend the public good is expensive, provide a low amount of the good and personally pocket the difference when it is not expensive.
- Regional authorities are elected and can potentially be re-elected. Voters read in the provision of the public good the type of the incumbent. They then use this information in their decisions on whether to re-elect the incumbent or vote for a challenger. Is in this sense, that decentralization allows better selection of politicians. To incorporate this feature, we develop a political agency model with probabilistic voting that elaborates on Besley and Smart (2007).

We first characterize the conditions under which centralization is preferred to decentralization. As a result of the trade off as well as its interaction with the political process, decentralization is preferred by the citizens for sufficiently low correlation between the center and the region, sufficiently high probability of the good state of nature and, importantly, sufficiently high quality of the political class.

The model generates a subtle effect of decentralization on corruption. At a purely static level, the opportunities of corruption are greater under decentralization. On the other hand, precisely because of these opportunities, it is easier for voters to identify the incumbent's type and therefore expel the dishonest incumbent from office. Thus, centralization reduces the selection effect of elections. A dishonest incumbent can be re-elected in some states of nature, which gives him a second chance to extract corruption rents, provided

the level of political competition is sufficiently low. This way we add to an open debate about the effects of decentralization on corruption.<sup>4</sup>

We then endogenize the quality of politicians and associate the development of the private sector with the quality of the political class. This identifies a channel through which the political support to centralization/decentralization may vary over time and differ across regions. Building on Besley's intuitions (Besley, 2005), we offer a formal treatment of the willingness to gain political office. Changes in the distribution of income to be earned in the private sector affect the opportunity cost of becoming a politician. Whether this discourages rent seekers from becoming politicians depends on whether corruption rents are lower than the pride derived by benevolent politicians when holding office. Hence, when the utility value of corruption rents is smaller than that of the ego rents, the proportion of honest politicians is increasing in the level of development of the private sector. The conditions for this result are satisfied by a number of income distributions. Importantly, it holds for the log normal and pareto distributions; the functions that more accurately describe the actual distribution of incomes around the world. This result implies that the support for decentralization may increase as the economy develops.

To see whether shifts in the support to decentralization, caused either by economic or political development or exogenous shifts in citizens' preferences over public good consumption, lead to a demand for new constitutional arrangements, we determine the level of social discontent over the centralized regime. Discontent takes place when a majority of citizens prefer a move toward decentralization but their number is not enough to trigger a constitutional reform. We show that individuals might have even internalized this possibility when designing a constitution that establish a centralized distribution of the decision power over public good.

We end our analysis by exploring another source of citizens' disaffection with the political and fiscal system. We show that it is possible to generate situations in which politicians, independently of their type, impose centralization and do not respond to the demand for a change in the direction of

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<sup>4</sup>For a review see Bardhan and Mookherjee (2005).

decentralization.

These results provide insight to a number of different real world issues and related to a number of literatures.

We focus on the evolution of attitudes vis-a-vis centralization. This can explain the move toward decentralization in many countries, like Spain, UK, Italy, South-Africa and many others, the return to centralization in others, like France, Brazil and Argentina, and the existence of more stable systems like the decentralized scheme in Germany. Arguably, the creation of new countries and the push toward secession in some others, could be an associated phenomenon. In our model, these trends occur via the impact of development on the quality of the political class which determines in turn the relative benefits of decentralized constitutional arrangements.

Our results have implications for the constitutional process of the European Union. Opponents to the Treaty of Lisbon often emphasize that it implies centralization and undermines local democracy. In a way, the move toward “more Europe” implies that member countries resign portions of their sovereignty. Ganuza and Hauk (2004) show that economic integration receives more support from citizens in societies characterized by higher levels of political corruption. They also provide supporting evidence suggesting a negative relationship between the corruption perception index and the desired speed of integration, as measured by the Eurobarometer. Our model can also explain this relationship, although we show that it might be mediated by other factors, such as: political competition, the relative strength of potential corruption rents versus the politicians’ career concerns, or the population age distributions.

Contrary to most previous research, we emphasize the impact of economic conditions on the political viability of decentralization. In this sense, decentralization can be a consequence of both economic development and improvements in the quality of the political class or changes in public good consumption. This induces a note of caution in interpreting cross country evidence on the relationship between decentralization, corruption and growth.<sup>5</sup> Specifically, it

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<sup>5</sup>See, for example, Treisman (2000).



is not necessarily true that decentralization causes less corruption and more growth. In fact, the empirical literature provides conflicting evidence. While Fisman and Gatti (2002); Barenstein and de Mello (2001) find a positive effect of decentralization, Treisman (2002) finds the opposite result.<sup>6</sup> This is important to the extent to decentralization is often recommended to developing countries as a device to promote growth and reduce corruption (World Bank Independent Evaluation Group, 2008).

As we analyze the support for centralization from the perspectives of both citizens and politicians. We are able to identify a potential divorce between what voters want and what they are offered by the political class in terms of the organization of the country or the region. That political parties only partially and slowly respond to shifts in public opinion is well known in political science literature (e.g. Adams, Clark, Ezrow, and Glasgow (2004)). At the supranational level, the EU provides a good example of conflictive views over integration between mainstream politics and a large mass of the population (Steenbergen, Edwards, and de Vries, 2005)

As emphasized by Hindriks and Lockwood (2009), the literature on centralization and decentralization has generally overlooked the electoral accountability aspects of different fiscal schemes. They show that these different fiscal schemes have different effects on the capacity of elections for selecting and disciplining politicians. In particular, they show that centralization reduces the capacity of selecting good politicians. For this reason, centralization is the preferred fiscal system in situations where the quality of political class is low. Our analysis provides another perspective from a similar framework as we explore complementary characteristics of centralized and decentralized schemes and their impact on the evolution their associated political support.

Inasmuch our model shows how the evolution of the private sector influences the quality of the political class, this paper makes a contribution to the literature on the quality of government as well as to the growing literature on political careers (Besley, 2005; Caselli and Morelli, 2004; Keane and Merlo,

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<sup>6</sup>Treisman (2002) argues that the reason of the discrepancy is the use of a different set of controls, which suggests that the relationship is not fully robust.

2007; Mattozzi and Merlo, 2008). We share the obvious and common feature that the quality of politicians decreases in their opportunity cost. In our model, the development of the private sector increases the opportunity cost of holding office. The impact of higher private wages will affect politicians differently according to whether they are rent or ego seekers. We show that rent seekers react more rapidly and therefore leave politics quicker in situations where potential corruption rents are sufficiently low. In this case, the development of the private sectors increases the quality of the political class. Conversely, when corruption is high, a more attractive private sector reduces the quality of politicians. This result shows that the effect of the relative wage in the public sector compared with the private sector may be either positive, as in Caselli and Morelli (2004) and Messner and Polborn (2004), or negative, as in Mattozzi and Merlo (2008), conditional on the level of potential corruption rents.

To recapitulate, this paper is organized in the following way. Section 2 presents the model, characterizes the solutions for both centralization and decentralization and shows that the support to decentralization increases in regional divergences and the quality of the local political class. In section 3, we introduce the possibility of rational discontent. Section 4 examines the potential divorce between voters and politicians and shows that the citizens' support to decentralization may be unrepresented for low levels of political competition. We conclude in section 5 where we discuss some variations to the model.

## 2 Model

We analyze an economy, the region. There are two fiscal authorities, the region and the center.<sup>7</sup> Citizens derive utility from a public good ( $G$ ) and money. Each individual gets income from their labor market participation and pays taxes to the government. The government uses tax revenues to

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<sup>7</sup>In theory, this could also be a country and a supranational structure.

fund the provision of the public good but can to take part of it for personal consumption.

The capacity of providing the public good ( $\theta_j$ ) depends on the state of the nature, only observed by the government. This can be either  $H$  or  $L$ , where  $\theta_H > \theta_L$  with probabilities  $p$  and  $1 - p$ , respectively. In the state  $j \in \{H, L\}$  the per capita cost of providing one unit of the public good is  $\theta_j^{-\frac{1}{2}}$ . Thus, the per capita tax required to provide  $G$  is  $\tau \geq G\theta_j^{-\frac{1}{2}}$ .

Voters' utility takes the form  $u_i = 2G^{\frac{1}{2}} - \tau + w_i$ . The optimal public good provision is given by  $G^* = \arg \max 2G^{\frac{1}{2}} - G\theta_j^{-\frac{1}{2}} + w_i$ . It follows that a social planner who knew  $\theta_j$  would provide  $G^* = \theta_j$  and would collect  $\tau^* = \theta_j^{\frac{1}{2}}$ .

We view government through the lens of the political agency model.<sup>8</sup> This involves some typical ingredients. There is a principal-agent relationship between voters and government. The principal is constituted by the voters who delegate the decision making to the government, the agent. The government has private information on the state of nature. In our case, this is about the state capacity to provide public goods ( $\theta_i$ ). The informational advantage provides the possibility for the politician in office to behave opportunistically. As the motives for holding office are not purely altruistic, a problem of accountability emerges. Elections offer a possibility to (at least partially) reward or punish governments suspected of dishonest behavior. Voters observe taxes and public good provision and employ this information to form an opinion concerning the incumbent's type. If citizens infer that the government might not be honest, the incumbent is not reelected and voters elect another candidate. Actions in office can also signal honesty. As we will show in the analysis below, an incumbent interested in re-election will find opportunities to demonstrate honesty. In these cases, the incumbent is re-elected. In other circumstances, the voters can not infer the type of the politician in office and the incumbent's chances of win the election are the same as for any other candidate. Finally, there will cases where the provision of public good is uninformative and hence the incumbent can run for re-election with the same probability of winning as any other challenger.

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<sup>8</sup>Besley (2006) offers a comprehensive discussion of political agency models.

There are three dates, 0, 1 and 2. In the first date ( $t = 0$ ), the region holds a referendum on whether to accept a centralization plan. Under centralization, the center determines the public good provision, collects taxes from the region, transfers the corresponding funds to the government of the region, and then the regional government executes the center instructions. Under decentralization, the government of region decides the level of public good and tax accordingly.

In the following period ( $t = 1$ ), the citizens elect a politician. As there is no incumbent, a candidate is randomly elected. In  $t = 2$ , the citizens make an inference about the quality of the incumbent and vote accordingly. If the incumbent is not reelected, a challenger is randomly chosen.

## 2.1 Decentralization

Politicians/citizens come in two breeds. One of those breeds derives ego or pride rents from office (the E-type henceforth). An E-type obtains utility  $\Delta$  each period in office. The E-types are concerned about how history will judge them (or their future careers). After leaving office, if history finds the politician behaved in a dishonest way, with some probability  $\delta$ , the ego rents of the E-type politician go away. This possibility induces the E-types to behave as an honest social planner. Thus, an E-type in office provides  $G_H = \theta_H$  and  $G_L = \theta_L$  depending on whether nature is H or L.

The other breed of politicians, the R-type, only cares about monetary compensation. For this reason, an R-type in office may behave dishonestly in situations where corruption rents are possible. Under decentralization, this happens whenever the state of nature is H. Since the government holds an informational advantage, the R-type in office can provide  $G = \theta_L$  even if the nature was  $H$ , and pocket the corresponding corruption rents. The corruption rents are given by

$$CR = \theta_L^{\frac{1}{2}} - \theta_H^{-\frac{1}{2}}\theta_L = \theta_L^{\frac{1}{2}} \left(1 - \theta_H^{-\frac{1}{2}}\theta_L^{\frac{1}{2}}\right) \quad (1)$$

Notice that equation (1) implies an upper bound on the value of corruption. This is because corruption in this model is exclusively determined by the

informational advantage of being in office. If the value of the public good was lower than  $\theta_L$ , it would be evident that the government incurred in corruption activities which would trigger audits and, eventually, punishment.

We call  $W^H$  and  $W^L$  the welfare under high provision and low provision of public good, respectively. Since we assume individuals to be identical, for the time being,  $W^H$  and  $W^L$  are

$$\begin{aligned} W^H &= 2\theta_H^{\frac{1}{2}} - \theta_H^{\frac{1}{2}} = \theta_H^{\frac{1}{2}} \\ W^L &= 2\theta_L^{\frac{1}{2}} - \theta_L^{\frac{1}{2}} = \theta_L^{\frac{1}{2}} \end{aligned}$$

Notice that an R-type in government will always provide  $G = \theta_L$ , which is inefficient whenever the nature is H. On the other hand, E-types will always provide the efficient level of public good. Thus, voters would ideally elect an E-type.

The types of the candidates are not observable. That means that a candidate is randomly elected in  $t = 1$ . The proportions of E-types and R-Types that run for office are given by  $\pi$  and  $1 - \pi$ , respectively. In our analysis, we will interpret  $\pi$  as the quality of the regional political class.

After one period in office, the incumbent can be reelected. Voters observe the level of public good and update their prior beliefs about the incumbent's type. A re-election takes place if the posterior probability that the incumbent is of an E-type is greater than the prior probability of electing a challenger of an E-type (i.e.  $\pi$ ). How do voters update their beliefs about the incumbent's type? This depends on how much can be inferred from the public good provision. First, if the level of public good provided in  $t = 1$  were  $\theta_H$ , then voters would correctly infer that the incumbent is of an E-type with probability one and the incumbent would be re-elected. If the level of public good provision were  $\theta_L$ , voters would know that the state of nature is  $L$  with probability  $1 - p$  and therefore they would assign the incumbent a probability  $(1 - p) \times \pi$  of being of an E-Type. As this is obviously lower than  $\pi$ , they would not re-elect the incumbent and a challenger would be randomly elected.

We may summarize the ex-ante expected welfare under decentralization ( $W^{DC}$ ) as:

$$\begin{aligned}
W^{DC} &= \pi p(H + pH + (1 - p)L) + \\
&\quad \pi(1 - p)(L + \pi(pH + (1 - p)L) + (1 - \pi)L) + \\
&\quad (1 - \pi)(L + \pi(pH + (1 - p)L) + (1 - \pi)L),
\end{aligned}$$

which simplifies to

$$W^{DC} = \pi p(2 + p(1 - \pi))H + (2 - \pi p(2 + p(1 - \pi)))L$$

## 2.2 Centralization

Under centralization, the center decides the level of public good to be provided to the region, collects taxes accordingly and transfers the funds to the regional government. The regional government in turn uses the transfer to provide the public good. As the center does not execute the provision of public good, the central decisions on its level are disinterested and efficient according to the state of nature observed in the center  $\hat{\theta}_j$ , with  $j \in \{H, L\}$ . However, the states of nature in the center and the region may differ, or the center can only partially observe the state of the nature in the Region. To capture this, we allow probabilities associated with each state to differ. The probabilities associated with  $\hat{\theta}$  are defined by  $P_H = P[\hat{\theta} = \theta_H/\theta = \theta_H]$  and  $P_L = P[\hat{\theta} = \theta_H/\theta = \theta_L]$ .<sup>9</sup> Consequently, the probability structure is as follows:

<i>Region/Center</i>	$\hat{\theta}_H$	$\hat{\theta}_L$
$\theta_H$	$pP_H$	$p(1 - P_H)$
$\theta_L$	$(1 - p)P_L$	$(1 - p)(1 - P_L)$

It is important to note that this probability structure can also reveal information about the type of the central government. Although we emphasize that corruption rents are lower for central than for local authorities, it might

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<sup>9</sup>This is a simple way to give an informational advantage to the regional authorities. Any information (or communication) structure which preserved such advantage would yield similar results.

be possible for the central government to retain funds from the region in order to generate corruption rents. In our model, this would be the case of a central government imposing  $G = \theta_L$  irrespectively the state of the nature. That is,  $P_L = 0$  and  $P_H = 0$ . Thus, we can rationalize dishonesty in the central provision of public good as a low correlation between the state of nature in the center and in the region. We shall discuss below the effects of this correlation on the comparison between centralization and decentralization.<sup>10</sup>

We wish to understand the incumbent's behavior in each of the four resulting situations. We assume no incumbent advantage. This is important because there will be situations where the provision of public good does not reveal any information about the incumbent's type and therefore an incumbent of whatever type will be able to run for re-election with the same probability of being elected as the challengers.

### 2.2.1 Welfare under Centralization

We begin by analyzing the welfare under each combination of  $\theta$  and  $\hat{\theta}$ .

- **Situation H.** With probability  $pP_H$ , the center determines  $G = \theta_H$  and collects  $t = \theta_H^{\frac{1}{2}}$ . As the center transfers sufficient funds, both types of regional government are bound to provide the high level of public good. A lower provision would trigger an inspection from the center where the misuse of funds may be discovered and punished. Hence, the regional government provides  $G = \theta_H$  and the utility of the citizens in the region corresponds to  $W^H$ . Since the provision of public good does not reveal any information about the incumbent's type, the challenger and incumbent have the same probability of being elected in the next election.

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<sup>10</sup>The probability structure can also reflect situations where the local government renounces the informational advantage and reveals the true state of the nature to the central government, either by benevolence or Party discipline. Although we prefer not develop this possibility, note that effective information sharing will simply imply a high correlation between  $\theta_i$  and  $\hat{\theta}_i$ .

- **Situation I.** With probability  $(1 - p)P_L$ , the center determines  $G = \theta_H$  and collects  $t = \theta_H^{\frac{1}{2}}$  to be transferred to the region. However, the true state of the nature in the region is  $\theta_L$ . That means that the transfers from the center can only fund a level of public good  $G = (\theta_H\theta_L)^{\frac{1}{2}}$ . Utility in this case is

$$W^I = 2(\theta_H\theta_L)^{\frac{1}{4}} - \theta_H^{\frac{1}{2}}. \quad (2)$$

A lower level of public good provision may again initiate audits by the center which, in this this situation, would confirm that the state of nature in the region prevented the government from fully executing the center's instructions. Hence, the incumbent's type is not revealed, which allows the incumbent to run again for office and be re-elected with the same probability of winning than any of the challengers.

- **Situation O.** With probability  $p(1 - P_H)$ , the center decides  $G = \theta_L$ , and collects  $t = \theta_L^{\frac{1}{2}}$  to be transferred. However, the state of nature in the region is H. This allows whoever is in office to behave strategically.

The R-type receives instructions and funds to provide  $G = \theta_L$ . As the cost of providing the public good is lower in the Region than what is perceived in the Center, it is possible to provide  $G = \theta_L$  and keep the remaining funds for personal use. The potential rents to extract are  $\theta_L^{\frac{1}{2}} - \frac{\theta_L}{\theta_H^{\frac{1}{2}}}$ , which coincide with the corruption rents identified for the case of decentralization. Notice that this case arises with probability  $p(1 - P_H)(1 - \pi)$  and that the implied utility corresponds to  $W^L$ . Since  $G = \theta_L$  is consistent with the instructions given by the center, there will no monitoring by the center. However, voters will update their beliefs about the incumbent's type in a way that they will prefer to elect a challenger. To see why, notice that, as in the case of decentralization, the probability of being of an E-type after providing  $G = \theta_L$  for an incumbent is lower than the one associated with the challengers.

The E-type has an opportunity to signal his type by providing a higher level of public good than instructed. In this case, the provision of public



good reveals that the incumbent is of an E-type with probability 1, which guarantees re-election. Thus, with probability  $p(1 - P)\pi$ , the provision of public good is  $G = (\theta_H\theta_L)^{\frac{1}{2}}$  with  $t = \theta_L^{\frac{1}{2}}$  and the utility becomes

$$W^O = 2(\theta_H\theta_L)^{\frac{1}{4}} - \theta_L^{\frac{1}{2}}.$$

- **Situation L** With probability  $(1-p)(1 - P_L)$ , the center decides  $G = \theta_L$  and  $t = \theta_L^{\frac{1}{2}}$  which is optimal according to the state of nature in the region being L. Neither type of politician in office can offer a level of public good different from  $\theta_L$  and therefore Utility under this state is  $W^L$ . In this situation, voters cannot discern the reasons behind the decision of providing  $\theta_L$  given that they cannot observe the state of nature in the Region. Therefore, as  $\theta_L$ , may also be the level provided by an R-type in situation  $O$ , voters will prefer a challenger to the incumbent and re-election becomes impossible.<sup>11</sup>

This description of centralization rules out any degree of local fiscal autonomy like the possibility for an honest incumbent to increase taxes in the situation  $O$  or returning taxes in the situation  $O$ , which would be more efficient from the regional perspective. Note that we could straightforwardly relax the level of centralization to incorporate this possibility in our analysis but, as it will be clear below, our message would remain unchanged.

Collecting these observations, we can express welfare in the first period under centralization as:

$$W_1^{CE} = pP_HW^H + (1-p)P_LW^I + p(1 - P_H)\pi W^O + [(1-p)(1 - P_L) + p(1 - P_H)(1 - \pi)]W^L \quad (3)$$

Welfare in the second period only differs in the case where an E-type was identified as the efficient provision of public good is guaranteed. In this case

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<sup>11</sup>The voters' beliefs yielding this electoral behavior are explained in more detail in section 2.1.

welfare in  $t = 2$  is

$$W_2^{CE}|p(1 - P_H)\pi = pP_HW^H + (1 - p)P_LW^I + (1 - p)(1 - P_L)W^L + p(1 - P_H)(1 - \pi)W^O + p(1 - P_H)\pi W^O;$$

that is,

$$W_2^{CE}|p(1 - P_H)\pi - W_1^{CE} = p(1 - P_H)(1 - \pi) (W^O - W^L) \quad (4)$$

Using (4), we can summarize the expected welfare associated with centralization as

$$W^{CE} = 2W_1^{CE} + (p(1 - P_H))^2 \pi (1 - \pi) (W^O - W^L)$$

Which after plugging in (3) we obtain

$$W^{CE} = 2 [p (P_HW^H + (1 - P_H)W^L) + (1 - p) (P_LW^I + (1 - P_L)W^L)] + (2 + p(1 - P_H)(1 - \pi)) p(1 - P_H)\pi (W^O - W^L)$$

### 2.3 Comparison Centralization and Decentralization

It is clear that centralization has pros and cons from the regional perspective. On the one hand, natures in the Center and Region might not be perfectly correlated, centralization may impose an inefficient level of public good because the center may determine  $G = \theta_H$  in situations where the state of nature in the region is L. This situation occurs with probability  $(1 - p)P_L$ .

But on the other hand, centralization reduces the corruption opportunities in each period. To see this, notice that corruption takes place under decentralization with probability  $p(1 - \pi)$ . Under centralization, corruption case arise with probability  $p(1 - P_H)(1 - \pi)$ , which is obviously lower than  $p(1 - \pi)$ .

To see the influence of the correlation more clearly, notice that a perfect correlation between  $\hat{\theta}_j$  and  $\theta_j$  implies  $P_H = 1$  and  $P_L = 0$ . In this case, the

probabilities of an state with either corruption or inefficient provision of public good under centralization are zero. Thus, we have

**Proposition 1** *The relative benefit of centralization increases with the level of correlation between the states of nature in the center and in the region.*

The benefits of decentralization logically increase with the quality of the local political class. To see this, we can express  $W^{DE} - W^{CE}$  as

$$\begin{aligned} W^{DE} - W^{CE} = & \pi p(2 + p(1 - \pi)) (W^H - W^L) - \\ & (2 + p(1 - P_H)(1 - \pi)) p(1 - P_H)\pi (W^O - W^L) + \\ & 2W^L - 2p(P_H W^H + (1 - P_H)W^L) \\ & + 2(1 - p)(P_L W^I + (1 - P_L)W^L) \end{aligned} \quad (5)$$

We differentiate 5 with respect to  $\pi$  we obtain the following result.

**Proposition 2** *The relative benefit of centralization decreases with the quality of the regional political class.*

**Proof** We need to show that  $\frac{\partial(W^{DE}-W^{CE})}{\partial\pi} > 0$ . After differentiating, we obtain

$$\begin{aligned} \frac{\partial(W^{DE} - W^{CE})}{\partial\pi} = & p(2 + p(1 - 2\pi)) (W^H - W^L) - \\ & p(1 - P_H)(2 + p(1 - P_H)(1 - 2\pi)) (W^O - W^L). \end{aligned}$$

Noticing that  $(W^H - W^L) > (W^O - W^L)$ , it is immediate to show that this is positive for  $\pi < \frac{1}{2}$ .

Consider the case of  $\pi > \frac{1}{2}$ . As  $\frac{\partial(W^{DE}-W^{CE})}{\partial\pi^2} < 0$ , we can evaluate  $\frac{\partial(W^{DE}-W^{CE})}{\partial\pi}$  at  $\pi = 1$  and verify if  $\frac{\partial(W^{DE}-W^{CE})}{\partial\pi}$  is still positive. That is,

$$\left. \frac{\partial(W^{DE} - W^{CE})}{\partial\pi} \right|_{\pi=1} = p(2-p)(W^H - W^L) - (2-p(1-p_H))p(1-P_H)(W^O - W^L)$$

A sufficient condition for this expression to be positive is  $p(2 - p) > (2 - p(1 - p_H))p(1 - p_H)$ . Notice that  $p$  and  $p(1 - p_H)$  are values of a more general function  $y = p'(2 - p')$  which is a parabola increasing in  $p'$  for  $p' < 1$ . Given that  $p > p(1 - p_H)$ , it follows that  $\left. \frac{\partial(W^{DE} - W^{CE})}{\partial\pi} \right|_{\pi=1} > 0$ . ■

This result emphasizes that the advantages of decentralization are relatively more sensitive to increments in the proportion of E-types than those associated with centralization. This is because centralization, as shown above, offers fewer per-period corruption opportunities and therefore its welfare dependence on the quality of politicians is milder than in the case of decentralization. Interestingly, variations in  $\pi$  may induce the population to shift their preferences over centralization to decentralization. To investigate this, we require first a better understanding of how  $\pi$  is determined.

## 2.4 Career choice

We wish to link the quality of the political class with the evolution of the private sector. Suppose all individuals in a society (both E-types and R-types) decide whether to run for office or to stay in the private sector. Suppose further that a person running for office and being elected cannot work in the private sector while serving in office.<sup>12</sup>

Office rents under centralization and decentralization differ as the corruption and re-election opportunities take place in different states of the nature. We defer the specific analysis on these rents to the next section where we study regional politicians' preferences over centralization. We maintain now a general level of analysis and simply denote  $ER$  the combination of public sector wage and ego rents derived by the E-type and  $RR$  the monetary rents received by an R-type, when in office. Thus, individuals decide to run for the election whenever their expected rents in office exceed their salary in the pri-

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<sup>12</sup>In principle parliamentarians in some countries can still hold private jobs legally. However, we focus on those kinds of executive political positions whose degree of commitment are incompatible with a serious involvement in private activities.

vate sectors, which is given by  $w_i$ . We assume  $w_i$  be drawn from a continuous probability distribution.

It follows that the fraction of individuals among E-types who decide to become politicians is

$$P(ER > w_i) = \Phi_{\mu}(ER),$$

while for the R-types,

$$P(RR > w_i) = \Phi_{\mu}(RR)$$

where  $\mu$  is a parameter that accounts for the development level of the Region. This could be, for example, the mean of  $w_i$  or a bound of the distribution.

Hence, given that a fraction  $\lambda$  of the population is of an E-type, the proportion of E-types that become politicians is:

$$\pi = \frac{\lambda \Phi_{\mu, \sigma^2}(\Delta(1+p))}{\lambda \Phi_{\mu, \sigma^2}(\Delta(1+p)) + (1-\lambda) \Phi_{\mu, \sigma^2}(pCR)}$$

Differentiating with respect to  $\mu$  yields

$$\frac{\partial \pi}{\partial \mu} = \frac{\lambda(1-\lambda) \left( \frac{\partial \Phi_{\mu, \sigma^2}(ER)}{\partial \mu} \frac{1}{\Phi_{\mu, \sigma^2}(ER)} - \frac{\partial \Phi_{\mu, \sigma^2}(RR)}{\partial \mu} \frac{1}{\Phi_{\mu, \sigma^2}(RR)} \right)}{\Phi_{\mu, \sigma^2}(RR) \Phi_{\mu, \sigma^2}(ER) (\lambda \Phi_{\mu, \sigma^2}(ER) + (1-\lambda) \Phi_{\mu, \sigma^2}(RR))^2}$$

Thus, the proportion of E-type politicians increases with the wages paid in the private sector if the elasticity of the cumulative distribution function with respect to  $\mu$  is higher at  $ER$  than at  $RR$ . As a result, private sector development raises the proportion of E-types for any distribution that respects this condition. It turns out that this condition holds for the uniform distribution and, most importantly, for the log-normal and Pareto distributions.

**Proposition 3** *Consider that  $w_i$  is distributed according to any of the following functions: Log-normal; Pareto; or Uniform. Then  $\frac{\partial \pi}{\partial \mu} > 0$  if  $ER > RR$ .*

**Proof** See Appendix A.1. ■

The evolution of the private sector may generate variation in the quality of the regional political class and imply that the development of the region affects the preferences over centralization. A positive effect of the private sector on the proportion of E-type politicians requires that the relative (opportunity) cost of serving in office is greater for the R-types than for the E-types. When this holds, the E-types will more rapidly lose interest in politics than the R-types as a response to improvements in the private sector. Importantly, this pro-efficiency re-allocation effect of the private sector depends on whether the corruption rents generate lower utility to the R-politician than the ego-rents to the E-types. As a corollary, an implication of our results is that in economies with large corruption opportunities the development of the private sector will have a *negative* effect on the quality of the government. An additional interest of this result comes from the fact that the actual income distributions follow a combination of a log-normal (for relatively low incomes) and a Pareto (for sufficiently high incomes).

### 3 Rational Discontent

The possibility of changes in the quality of politicians and therefore in the preferences over centralization or decentralization suggests that the majorities supporting centralization may also vary over time. In some cases, moving toward centralization or decentralization requires different majorities. If a majority of voters was in favor of centralization in the past, but the dissolution of this scheme requires a larger majority (supermajority), it might be possible for the region to be in a situation where a widespread discontent about centralization is insufficient to move toward a decentralized system. It is even possible that such discontent was anticipated at the moment of voting in favor of centralization, but that the disutility of such discontent was not strong enough to discourage the vote for centralization. Thus, future discontent may be the result of a rational decision by the individuals. This initial vote for central-

ization could be enshrined in a constitution, whose rule changes often require a supermajority. The later disaffection is reminiscent of the movements for regional devolution in many parts of the world.<sup>13</sup> Hence our model can shed insights into these phenomena.

It is straightforward to construct an equilibrium in which the majority of voters are “rationally” disaffected with centralization. In this scenario, voters exhibit *majoritarian but insufficient discontent*. That is,  $P(u_{i2}^{DE} - u_{i2}^{CE} \leq 0) \in [1 - T_{SM}, \frac{1}{2}]$ , where  $P(u_{i2}^{DE} - u_{i2}^{CE} \leq 0)$  is the fraction of voters preferring centralization and  $T_{SM}$  is a supermajority threshold. In this situation, discontent with centralization would be rational if citizens voted for centralization in the past ( $t = 1$ ), even if unavoidable discontent was expected to occur in the future ( $t = 2$ ). This requires,  $P(u_{i1}^{DE} - u_{i1}^{CE} + u_{i2}^{DE} - u_{i2}^{CE} \leq 0) > \frac{1}{2}$ .

To investigate the existence of rational discontent, we abandon the assumption of identical voters. We consider that individual utilities are described by

$$u_i = 2\phi_i G^{\frac{1}{2}} - \tau + w_i$$

where  $\phi_i \sim \Phi[0, \infty)$  captures the fact that individuals may differ in the way they enjoy from public good consumption. Interestingly, we can associate changes in  $\Phi$ , and therefore in the majorities supporting centralization, to economic development, changes in the distribution of income, or exogenous changes in the preferences over public good consumption (provoked, for example, by changes in the population age distribution).

Notice that if we additionally assume that the median of  $\Phi$  is equal to 1, the previous analysis goes through in contexts where the individuals vote to determine the public good policy in every period.

Clearly,  $i$  would prefer centralization whenever  $u_i^{CW} - u_i^{NCW} > 0$ . We show in the appendix A.2 that, after a bit of algebra and (innocuously) assuming  $\theta_L = 0$ , this expression becomes:

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<sup>13</sup>Although the model is not, strictly speaking, valid for the European Union, this aspect strongly reminds, and perhaps explains, part of the rationale behind euroskeptical movements in various European countries.

$$\begin{aligned}
u_i^{DE} - u_i^{CE} &= (2\phi_i - 1) (W^{DE} - W^{CE}) \\
&\quad - 2(\phi_i - 1) \left(\theta_H^{\frac{1}{4}}\right) \left(2(1-p) P_L \theta_H^{\frac{1}{4}}\right),
\end{aligned} \tag{6}$$

where

$$W^{DE} - W^{CE} = W^H [\pi p (2 + p(1 - \pi)) + 2(1 - p) P_L - 2pP_H]$$

after replacing  $\theta_L = 0$  in equation (5). From equation (6), the preference over centralization depends on the utility generated by the public good ( $\phi_i$ ) and on the comparison between  $W^{DE}$  and  $W^{CE}$ . This identifies two sources of change in the support for centralization: the quality of the political class, as a main determinant of  $W^{DE} - W^{CE}$ , and the distribution of  $\phi_i$ .

Notice that for the median  $\phi$ , 6 only depends on  $W^{DE} - W^{CE}$  and thus, as we show above, changes in  $\pi$  may shift the preference of the median  $\phi$ . Notice however that 6 is not necessarily single-peaked in  $\phi$  and therefore the median  $\phi$  does not necessarily express the preference of the majority. However, the following lemma shows that this is indeed the case.

**Lemma 1** *The system providing the highest welfare with homogenous agents, is majoritarian with heterogeneous agents.*

**Proof** See Appendix A.3 ■

For majoritarian but insufficient future discontent, it is required that

$$P(\phi_i < \hat{\phi}_i) \in \left[\frac{1}{2}, 1 - T_{SM}\right], \tag{Condition RD1}$$

where  $\hat{\phi}_i$  is such that the individual  $i$  is indifferent between centralization and decentralization. More explicitly,  $\hat{\phi}_i$  is defined by

$$\hat{\phi}_i = \frac{\pi_2 p (2 + p(1 - \pi_2)) - 2pP_H - 2(1 - p) P_L}{2(\pi_2 p (2 + p(1 - \pi_2)) - 2pP_H)}$$



The fact that  $P(\phi_i < \hat{\phi}_i)$  depends on  $\Phi$  and  $\hat{\phi}_i$  identifies some channels through which discontent may emerge. First,  $\Phi$  may respond to ageing or changes in income distribution. This would be the case if we consider the public good to be public expenditures involving health, social security or social benefits. Second,  $\hat{\phi}_i$  depends on the quality of the political class and the structure of shocks.<sup>14</sup>

We turn now to the possibility of *Discounted Discontent*. Using Lemma 1, it is straightforward to see that this situation requires  $W_1^{NCW} - W_1^{CW} + (W_2^{NCW} - W_2^{CW}) < 0$ . That is, after some manipulation,

$$W^H (4((1-p)P_L - pP_H) + p(\pi_1(2 + p(1 - \pi_1)) + \pi_2(2 + p(1 - \pi_2)))) < 0$$

(Condition RD2)

The key mechanisms underlying this condition are the correlation between the Center and the region, and the initial quality of the regional political class. Notice that Condition RD2 is less likely to hold for high values of  $\pi_1$  or  $\pi_2$  which imply lower gains from centralization and high values of  $P_H$  which increase the regional interest in centralization.

Summarizing the previous discussion leads to the following result:

**Proposition 4** *If Condition RD1 and Condition RD2 hold, then the region under centralization is characterized by Rational Discontent.*

The model is thus able to generate a situation where the future discontent is discounted by initial supporters of centralization even if they would find themselves unhappily stuck in a centralized regime in the future. Notice that if individuals discounted the future, rational discontent would be more likely to occur.

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<sup>14</sup>For example, notice that  $\hat{\phi}_i$  is increasing in  $\pi_2$  for  $\pi_2 < \frac{p(1+p)}{2}$ , which suggests that widespread but insufficient support to decentralization is associated with an improving, yet relatively poor political class.

## 4 Discontent and Political Representation

We introduce political competition. Let  $n$  be the number of politicians in competition. In absence of prior information about the incumbent, all candidates have the same probability of being elected,  $\frac{1}{n}$ .

Following our previous analysis, each period in office the R-type can extract corruption rents with probability  $p(1 - P_H)$  under centralization. As discussed above, decentralization offers more corruption opportunities. These take place with probability  $p$ . However, from the R-type's perspective, centralization has the advantage of generating situations where the public good provision reveals no information about the incumbent's type hence providing the possibility of re-election. The probability of re-election for an R-type is  $(pP_H + (1 - p)P_L)\frac{1}{n}p(1 - P_H)$ . Overall, whether an R-type would prefer centralization or decentralization will depend on the level of political competition. To show this, the expected values of the R-types if in office are

$$V_{CE}^R(n) = p(1 - P_H)CR + (pP_H + (1 - p)P_L)\frac{1}{n}p(1 - P_H)CR,$$

under centralization and

$$V_{DE}^E(n) = pCR$$

under decentralization. This means that an R-type prefers centralization for

$$n < (pP_H + (1 - p)P_L)\frac{(1 - P_H)}{P_H} = n^R$$

Recall that  $\Delta$  denoted the ego-rents from office derived by the E-type. Under centralization, the E-type is re-elected with certainty with probability  $p(1 - P_L)$ . Re-election is also possible with probability  $\frac{1}{n}$  in the states of nature where no information about the incumbents has been revealed. Again, this happens with probability  $(pP_H + (1 - p)P_L)\frac{1}{n}p(1 - P_H)$ . Under decentralization Re-election takes place with probability  $p$ . Thus, the payoffs in office of the E-type under centralization and decentralization are

$$\begin{aligned}
V_{CE}^E(n) &= \Delta + p(1 - P_H)\Delta + (pP_H + (1 - p)P_L)\frac{1}{n}\Delta \\
V_{DE}^E(n) &= (1 + p)\Delta
\end{aligned}$$

Hence, an E-type in office prefers *CW* if

$$n < \frac{(pP_H + (1 - p)P_L)}{(1 - P_H)p} = n^E$$

Thus,

**Proposition 5** *The regional political consensus is in favor of centralization irrespective of voters's preferences emerges for  $n < \min\{n^R, n^E\}$ .*

The intensity of political competition affects the preferences of politicians over centralization and decentralization. When competition is low, the prospects of re-election under centralization make this system be preferred from the politicians' viewpoint. Notice that the condition on the number of candidates in competition is easily relaxed by assuming some level of incumbent's advantage. In this case, it is more likely to find political consensus over centralization.

This result is important to understand the possibility of unrepresented discontent in situations where voters would prefer a decentralized regime. A sufficiently small number of candidates generates an opposite consensus in the political class. A small number of candidates facilitates as well collusion between political candidates, which would guarantee that no candidate offers a move toward decentralization. It may seem surprising that no candidate includes decentralization in the platform if this is what voters actually prefer.

To see why this might happen, notice that the candidates' types are unknown, and hence proposal can potentially reveal the candidates's type. To sustain a pooling equilibrium where no candidate proposes decentralization, all that is required is that a proposal for decentralization is believed with sufficiently high probability to come from an R-type. Under this assumption,

any candidate proposing decentralization would not be elected (because of the welfare under decentralization with the certainty of an R-type is lower than the ex-ante welfare associated with centralization. Notice that these out of equilibrium (and hence arbitrary) beliefs would satisfy the intuitive criterion developed by Cho and Kreps (1987).

The fact that the E-type politicians would prefer centralization in presence of low levels of political competition involves the following corollary:

**Corollary 1** *Corruption opportunities are greater under centralization for low levels of political competition.*

In section 2.3 we show that centralization leads to lower corruption opportunities in a given period. However, as we just discussed, under centralization it is harder to detect corrupt incumbents. This is the reason why the E-types would prefer centralization in regions where the incumbent faces a sufficiently small number of challengers. Thus, we have shown that the dependence between decentralization and corruption varies with the degree of political competition.

## 5 Extentions and robustness checks

Here we sketch implications of some variations of our model.

- **Full Centralization.** We have analyzed an intermediate form of centralization. Full centralization would require a central bureaucracy in charge of delivering the public good to the region. In this case, the regional authority would find no corruption opportunities associated with the provision of public good. This situation would make the R-type to be in favor of decentralization. For the E-type this is less obvious. On the one hand, the absence of control over the public good reduces the opportunities to signal honesty or efficiency. Moreover, when the delivery of public good is exclusively a central government activity, citizens would be less concerned about the regional government's type. For this reason,

an E-type politician would prefer a move toward centralization. On the other hand, inasmuch the term in office is opaque about the incumbent's type, the probability of reelection only depends on the level of political competition. That is, when political competition is low the incumbent enjoys from a positive probability of being re-elected in all the states of nature. This effect can make the E-type prefer full centralization to decentralization. In any case, a clear effect of full centralization is that it breaks potential political consensus over centralization unless the political class is composed of sufficiently few E-types. Full centralization may also have a positive effect on the composition of the political class since the development of the private sector would have a greater impact on R-types than on E-types, which would reduce in turn the proportion of R-types running for office.

As for the citizens, the advantages of full centralization would depend on whether the central bureaucrat is more or less corrupt than (or as efficient as) local politicians. There is no clear reason why embezzlement and capture would not be possible under full centralization. As discussed above, whether the local government dominates the central bureaucracy from the regional perspective will depend on a series of factors like accountability, political competition, the importance of regional elites and so on.

- **Grants and Regional Redistribution.** Assume 2 regions, a net receiver, region R, and a net contributor to public goods, region C. The central authority taxes more the citizens of R than what is returned in the form of funds for public goods. Therefore, the discontent over centralization is more widespread in C than in R. This discontent is clearly illustrated by the fact that regions with stronger national sentiments tend to be relatively wealthier. Notice that the preferences of the political class over centralization do not depend on the level of public good or taxation. Hence it is possible that an increase in regional redistribution would lead to greater unrepresented discontent in region C. Finally, be-

ing a net receiver can also influence the quality of the political class in both regions in opposite directions. To see this, notice that the increase of funding to R from the center would increase the value of corruption rents. Suppose now that the inflow of resources changes the ranking of ego and corruption rents. Further, suppose the increase in public good provision raises the profitability in the private sector. In this case, as shown in section 2.4, the E-types would relatively be less keen to become politicians, which would lead to a worsening in the quality of the political class in region R. The opposite would happen in region C.

## 6 Concluding remarks

In this paper we have studied how the evolution of the economy impinges in the reasons why citizens and politicians support or not fiscal centralization. We do this in a model where, under centralization, the center decides but the regions implement the policies. Since the center does not “touch” the money, it can make decisions in a more neutral, albeit less informed, manner. This produces a novel (in the literature) form of tradeoff between centralization and decentralization. One central characteristic of the story is that the quality of the political class is endogenous to the economic development process and also determines the “popularity” of centralization.

An important aspect for future research is to close the feedback loop between development and the quality of the political class. In our model, the level of development affects the quality of the political class, and through it, the benefits of each political system and social welfare. But it is easy to think of circumstances in which the influence also flows in the other direction. That is, the investment of politicians in public goods (e.g. education or R&D) can, in turn, affect the level of development or the productivity of the economy. The presence of both channels of influence could, for example, create multiple steady states (leading perhaps to “poverty traps”) in the evolution of the economy.

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## A Appendices

### A.1 Career Choice: distribution functions

#### A.1.1 The log-normal distribution

The cdf is given by

$$\frac{\partial \Phi_{\mu, \sigma^2}(x)}{\partial \mu} \frac{1}{\Phi_{\mu, \sigma^2}(x)} = \frac{\int_0^x \frac{2(\ln u - \mu)}{2\sigma^2} \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du}{\int_0^x \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du} \quad (7)$$

Then equation (7) becomes

$$\begin{aligned} &= \exp\left(-\frac{(\ln x - \mu)^2}{2\sigma^2}\right) \\ &\quad \frac{\frac{2(\ln x - \mu)}{2\sigma^2} \int_0^x \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du - \int_0^x \frac{2(\ln u - \mu)}{2\sigma^2} \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du}{\left(\int_0^x \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du\right)^2} \\ &= \exp\left(-\frac{(\ln x - \mu)^2}{2\sigma^2}\right) \frac{\int_0^x \left(\frac{2(\ln x - \mu)}{2\sigma^2} - \frac{2(\ln u - \mu)}{2\sigma^2}\right) \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du}{\left(\int_0^x \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du\right)^2} \\ &= \exp\left(-\frac{(\ln x - \mu)^2}{2\sigma^2}\right) \frac{\int_0^x \left(\frac{2(\ln \frac{x}{u})}{2\sigma^2}\right) \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du}{\left(\int_0^x \exp\left(-\frac{(\ln u - \mu)^2}{2\sigma^2}\right) du\right)^2} > 0 \end{aligned}$$

### A.1.2 The Pareto distribution

$$\Phi_\alpha(x) = 1 - x^{-\alpha}$$

$$\frac{\partial \Phi_\alpha(x)}{\partial (-\alpha)} = -x^{-\alpha} \ln x$$

$$\begin{aligned} &\frac{\partial \Phi_\alpha(\Delta(1+p))}{\partial (-\alpha)} \frac{1}{\Phi_\alpha(\Delta(1+p))} - \frac{\partial \Phi_\alpha(pCR)}{\partial (-\alpha)} \frac{1}{\Phi_\alpha(pCR)} \\ &= -\frac{(\Delta(1+p))^{-\alpha} \ln(\Delta(1+p))}{1 - (\Delta(1+p))^{-\alpha}} + \frac{(pCR)^{-\alpha} \ln(pCR)}{1 - (pCR)^{-\alpha}} \end{aligned}$$

Since  $-\frac{(x)^{-\alpha} \ln(x)}{1 - (x)^{-\alpha}}$  is increasing in  $x$ , the result also follows for the Pareto distribution.

### A.1.3 The uniform distribution

The salary in the private sector is  $w_i$ , where  $w_i$  is drawn independently for each citizen from a distribution which takes values uniformly in  $[\zeta, \xi]$ . The value  $\zeta$  changes with the level of development of each particular economy. For an E-type, whose rents from being a politician are  $ER$  this means that the fraction of individuals of the group who decide to become politicians is

$$P(ER > w_i) = \frac{ER - \zeta}{\xi - \zeta}$$

For an R-type whose political rents are  $RR$

$$P(RR > w_i) = \frac{RR - \zeta}{\xi - \zeta}$$

Hence, given that a fraction  $\lambda$  of the population is egomaniac, we have that the proportion of good politicians is:

$$\pi = \frac{\lambda(ER - \zeta)}{\lambda(ER - \zeta) + (1 - \lambda)(RR - \zeta)}$$

Hence

$$\begin{aligned} \frac{\partial \pi}{\partial \zeta} &= \frac{-\lambda(\lambda(ER - \zeta) + (1 - \lambda)(RR - \zeta)) + \lambda(ER - \zeta)}{(\lambda ER + (1 - \lambda)RR - \zeta)^2} \\ &= \frac{\lambda(1 - \lambda)(ER - \zeta) - \lambda(1 - \lambda)(RR - \zeta)}{(\lambda ER + (1 - \lambda)RR - \zeta)^2} \\ &= \frac{\lambda(1 - \lambda)(ER - RR)}{(\lambda ER + (1 - \lambda)RR - \zeta)^2} \end{aligned}$$

Thus, the fraction of e-type politicians increases with the level of development (measured by the worst outside option feasible to a citizen) as long as expected ego-rents  $ER$  are larger than the expected corruption rents  $RR$ .

## A.2 Rational discontent

Notice the following:

$$\begin{aligned}
u_i(H) &= (2\phi_i - 1) W^H \\
u_i(L) &= (2\phi_i - 1) W^L \\
u_i(I) &= (2\phi_i - 1) W^I + 2(\phi_i - 1) \left( (\theta_H \theta_L)^{\frac{1}{4}} - W^I \right) \\
u_i(O) &= (1 - \pi) \left( (2\phi_i - 1) W^L \right) + \\
&\quad \pi \left( (2\phi_i - 1) C + 2(\phi_i - 1) \left( (\theta_H \theta_L)^{\frac{1}{4}} - W^O \right) \right)
\end{aligned}$$

It follows that

$$\begin{aligned}
u_i^{DE} - u_i^{CE} &= (2\phi_i - 1) (W^{DE} - W^{CE}) \\
&\quad - 2(\phi_i - 1) \left( \theta_H^{\frac{1}{4}} - \theta_L^{\frac{1}{4}} \right) \left( 2(1 - p) P_L \theta_H^{\frac{1}{4}} - p^2 (1 - P_H)^2 (1 - \pi) \pi^2 \theta_L^{\frac{1}{4}} \right),
\end{aligned}$$

where  $W^{DE} - W^{CE}$  is defined by (5). Let us assume  $\theta_L = 0$  to make the comparison easier. In this case, equation (5) becomes

$$W^{DE} - W^{CE} = W^H [\pi p (2 + p(1 - \pi)) + 2(1 - p) P_L - 2p P_H] \quad (8)$$

and

$$\begin{aligned}
u_i^{DE} - u_i^{CE} &= (2\phi_i - 1) W^H (\pi p (2 + p(1 - \pi)) + 2(1 - p) P_L - 2p P_H) \\
&\quad - 2(\phi_i - 1) W^H (2(1 - p) P_L)
\end{aligned}$$

### A.3 Proof of Lemma 1

**Lemma 2** *The system of public good provision providing the highest (expected) welfare in the case of homogenous individuals, it is the one supported by the majority when individuals are heterogeneous.*

**Proof** Inspecting (8), we find that all individuals with  $\phi_i > \frac{1}{2}$  prefer decentralization if  $W^{DE} - W^{CE} > 0$  whenever

$$P_H < \pi \left( 1 + \frac{p}{2} (1 - \pi) \right). \quad (9)$$

Importantly, this condition is satisfied by the condition required for  $W^{DE} - W^{CE} > 0$ , which is

$$\pi_2 p (2 + p (1 - \pi_2)) + 2p P_H - 2(1 - p) P_L > 0. \quad (10)$$

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