

Why some Democracies Fail? Political Systems, Stability and Civil Wars

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Abstract

Social conflict and its effect on economic development has been recently studied in the Economics literature. The evidence supports the idea that social conflict and political instability is harmful for growth. Political Instability depends on the social and economic structure of each country. But it also depends on the specific political system each country is endowed with. In this paper we analyze theoretically and empirical the stability of the different political systems, that is, their ability to prevent conflict.

It is generally agreed that a high level of democracy is not sufficient for eliminating the risk of armed conflicts in heterogeneous societies. We develop

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a simple theoretical model that captures the basic relationship between the political system and rebellion. According to our model the proportional system turns out to have a lower probability that groups rebel than the majoritarian system. The intuition behind this result is that under the proportional system the opportunity cost of rebellion is higher than under majoritarian systems. In the empirical part we test the role of democracy and political systems in preventing civil wars. We show that democracy by itself does not play an important explanatory role, while the specific type of political system -majoritarian, presidential and proportional- does. The rationale of this result is that different political systems entail different opportunity costs of rebellion.

Given a particular level of democracy, countries with majoritarian or presidential systems are more prone to violence than countries with proportional systems where the opportunity cost of rebellion is higher. Therefore it seems that democracy is not a sufficiently effective vaccine against violence, even if it is necessary.

1 INTRODUCTION

Social conflict and its effect on economic development has been recently studied in the Economics literature. The evidence supports the idea that social conflict and political instability is harmful for growth. Political Instability depends on the social and economic structure of each country. But it also depends on the specific political system each country is endowed with. In this paper we analyze theoretically and empirical the stability of the different political systems, that is, their ability to prevent conflict.

Recent research tends to substantiate that political instability goes with slow growth. Precisely because of the costs associated to conflict, a society with low conflict of interests (egalitarian, for instance) will display higher political stability and faster growth. On this respect, it is particularly relevant the work by Alesina, Özler, Roubini and Swagel (1996) who provide statistically significant results showing a positive association between low growth, social polarization and political instability, as well as on the persistence of instability episodes. Furthermore, Perotti (1996) in his empirical test of the different explanations of the links between inequality and growth finds stronger support for the role played by political instability than for the effects of the existence of imperfections in the capital markets. Benabou (1996) reports empirical findings from studies that have examined the links between inequality, conflict over property rights, and growth. From these results he argues that the existing evidence supports the idea that inequality exacerbates social conflict, which in turn makes property rights less secure and reduces growth. Rodrick(1999) also recognizes that social conflict is important for economic development.

The connection between political instability, conflict and growth is a bit of a black box. There is some empirical literature exploring different channels through which growth slows down, but we are lacking of theoretical work. Mauro (1995) obtains evidence supporting that the channel between political instability and slow growth is through the high levels of corruption which go with political instability. Alesina and

Perotti (1997) propose the effects of political instability on investment as the possible channel linking it to growth. In particular, the intuition is that in highly polarized societies it is more likely that we observe radical changes in policies. It is this policy uncertainty what refrains investment. Svensson (1998) shows that the connection between political instability and investment (and growth) is empirically significant, but essentially through the instability of property rights. Easterly and Levine(1997) focus on the role of ethnic cleavages to explain Africa's Growth tragedy.

Social Conflict and its causes is an important subject to study from the economic point of view. There is no doubt of the importance of conflict for economic growth, therefore the study of its causes is crucial for development. Conflict has been also a central concern in the political science literature. On the one hand it has been argued that plural societies are not able to sustain a democratic government. On the other hand, it is argued that electoral systems play an important role in fostering or retarding conflict. However there is no agreement on which system promotes or reduces conflict.

This paper analyses theoretically and empirically if the political system plays a significant role in reducing conflict. In principle the answer seems to be obvious: the more democracy the country has, the less conflictive it is. However, there is no strong and clear evidence about the role of democracy neither on economic development nor on civil war. Barro(1996) analyzes the relationship between economic development and a measure of political freedom or democracy. He argues that one cannot conclude, from the evidence he finds, that more or less democracy is a critical element for economic growth. Moreover, the very question of which political system is more appropriate to reduce violence has not been addressed in depth. Here, we make a first step in the direction of exploring the links between different forms of the democratic system and the level of social conflict.

We develop a simple theoretical model that captures the basic relationship between the political system and rebellion. According to our model the proportional system

turns out to have a lower probability that groups rebel than the majoritarian system. The intuition behind this result is that under the proportional system the opportunity cost of rebellion is higher than under majoritarian systems. Moreover we also find that given a political situation, majoritarian systems need to have higher penalties if they want to avoid that groups rebel than proportional systems do. This result corroborates the idea that for a given political situation and penalty, majoritarian systems have a higher probability of rebellion.

From the empirical analysis there are three main contributions in this paper. First, we show how a political system is an important mechanism that can reduce the probability of civil war in a democratic system. This result clarifies the role of democracy itself. We observe that some countries with high levels of democracy suffer periods of violence and therefore the fact of having high levels of civil liberties and freedom does not seem to protect them against violence. We argue that what matters is the representation system of the voters in government more than the level of democracy per se. Empirically we find that the more inclusive is the system, the smaller is the probability of civil war.

Not all democratic governments represent voters in the same way, even when they have high levels of political rights and civil liberties. The basic argument of the paper is that in countries with a high level of democracy and majoritarian or presidential system, groups with lower representation are more likely to begin a rebellion than in countries with more inclusive systems. The reason is that the opportunity cost of rebellion under majoritarian systems is lower than under proportional systems. All democratic countries in our sample that have experienced civil war were under a majoritarian or presidential government, and none of them under a proportional system. However, most of them have a high level of freedom. Some examples are Mali in 1990, Nigeria in 1967 and 1980, Sudan in 1963, Uganda in 1978, Dominican Republic in 1965, Indonesia in 1975, Phillipines in 1972, Sri Lanka in 1971 and 1983, Papua New Guinea in 1988 among others. Indeed freedom seems not to be a sufficiently

effective vaccine against violence.

These results are robust to different explanatory variables. This means that the political system, which determines the level of inclusiveness, is an important political factor in reducing the probability of civil war.

Secondly we find that being Partially Free, accordingly with Gastil's measure of Democracy, has a higher probability of civil war relative to having autocracy. Having a majoritarian system with less freedom has the same effect on civil wars as a majoritarian system with a high level of freedom, and this effect is not significantly different from having an autocratic system. However presidential systems work in a different way. Under low levels of democracy, the presidential system seems to have a positive and significant effect on the probability of civil war relative to autocracy. However, when the country reaches the highest levels of democracy this effect disappears.

Third, we provide a time series cross-country database on political system from 1960 to 1995 based on the study of Colomer (2000).

This paper is organized in five sections. After the introduction, section two presents a brief review of the literature on conflict and civil wars. In third section we develop a general model capturing the basic relationship between political systems and the cause of rebellion. We provide a theoretical analysis of the stability of the different forms of political systems. Section four presents our empirical results on the role of democracy and political systems in explaining the probability of civil war. Finally, section five concludes.

2 A REVIEW OF THE LITERATURE

Studying social conflict situations has been considered for decades a matter for the political science. Yet we are recently observing an increasing number of contributions from economics. In this section we briefly summarize the most recent papers on this topic.

From the theoretical front Esteban and Ray (1999) provide general theoretical model of conflict. In Esteban and Ray (2001) address the acceptability of collective decision rules when players can precipitate a conflict game. Przeworski (2000) studies the stability of democracies depending on the aggregate income level. His main argument is that democracy is stable in affluent societies because the opportunity cost of rebellion becomes too large.

Another branch of the literature has studied the effect of economic and social factors on the probability of civil war. Collier and Hoeffler (1998) investigate the generic causes of civil wars as driven by economic factors. They build a simple theoretical framework based upon Hirshleifer (1987), Grossman (1995) and Azam (1995). In the empirical analysis they find that initial income, ethnolinguistic fractionalisation, the amount of natural resources and the initial population size are important in explaining the probability of civil wars. Moreover they postulate that coordination problems influence the risk of civil war. In their empirical analysis they proxy coordination cost by ethnolinguistic fragmentation and population size. They find that more fragmented societies are not more prone to civil war than the rest, but the danger of civil war rises when society is polarized into two ethnolinguistic groups. Collier and Hoeffler (1999) find that economic agendas appear to be central to understanding why civil wars get going. That is, they find strong evidence for the looting motivation. That conflicts are far more likely to be caused by economic opportunities than by grievance. They conclude that the objective factors which might contribute to grievance, such as income and assets inequality, ethnic and religious division, and political repression do not seem to increase the risks of conflict. Elbadawi (1998), from the analysis of the results of some comparative static experiments, find that ethnically polarized societies have a higher risk of suffering a civil war.

Easterly (2000) argues that the intensity of ethnic conflict depends not only on the level of ethnolinguistic fragmentation but also on the quality of institutions in each particular country. He shows that high quality institutions lessen war casualties

on national territory and lessen the probability of genocide for a given amount of ethnic fractionalization.

This paper examines theoretically and empirically the importance of the system of political representation as a factor that can reduce or promote the probability of civil war.

3 AN ANALYSIS OF THE STABILITY OF POLITICAL SYSTEMS

3.1 The Model

The objective of this section is to capture the basic relation between the probability of rebellion and the political system. The two dimensions that characterize political systems are Division of Powers and electoral rule. These two characteristics define three political systems: parliamentary-majoritarian, parliamentary-proportional and presidential systems. Under the presidential system, the president is elected by majoritarian rule, and the members of the assembly can be elected by majoritarian or proportional rule. Therefore we consider that presidential system has properties between majoritarian and proportional representation in the treatment of the representation of voters.

We develop a general model to capture the basic relationship between conflict and representation system of voters.

The economy consists of citizens divided into G social groups that support G political parties. Groups have preferences over policies. We shall assume that all individuals belonging to a given group share the same preferences. We shall identify each group by the policy they prefer most.

Policies are points in R_+ . We shall assume that preferences over policies are linear in the distance between each policy and the "one" that is most preferred. Let $\tilde{\alpha}_i$ be

the most preferred policy for group i , then the valuation of policy α_j by group i is given by,

$$u_i(\alpha_j) = -|\alpha_j - \tilde{\alpha}_i| \quad (1)$$

Generally speaking, the information relevant to any political system will be the location of the most preferred policy and the size of each group. We shall assume that group true preferences are public knowledge. We thus exclude that groups may strategically manipulate their location on the political spectrum. In this paper we shall focus on the role of the location of the groups on the policy spectrum on conflict and leave the role of group sizes aside. Therefore we shall assume that all groups have the same size.

A **Political Situation** will be described by a vector $\tilde{\alpha} \in R^G$ of most desired policies. An actual policy is a point in the real line. A **political system** f is a function that assigns a policy to each political situation,

$$\alpha = f(\tilde{\alpha}). \quad (2)$$

Without loss of generality we shall use the convention that $\tilde{\alpha}_i \leq \tilde{\alpha}_{i+1} \quad \forall i \in G$. Clearly, $|\tilde{\alpha}_1 - \tilde{\alpha}_G| \geq |\tilde{\alpha}_i - \tilde{\alpha}_j| \quad \forall i=1,2\dots G$.

We shall say that the political system f is **efficient** if there is no $\bar{\alpha}$ such that $|\tilde{\alpha}_i - \bar{\alpha}| \leq |\tilde{\alpha}_i - f(\tilde{\alpha})|$ for all i and with strict inequality for some i .

It is straightforward that the Political System f is efficient if and only if for every given $\tilde{\alpha}$, $f(\tilde{\alpha}) \in [\tilde{\alpha}_1, \tilde{\alpha}_G]$.

We shall restrict to efficient policies that are linear in $\tilde{\alpha}$. Therefore a policy will be a vector p in the unit simplex. Hence, the policy α implemented by p is

$$\alpha = \sum_{i=1}^G p_i \tilde{\alpha}_i. \quad (3)$$

The set of efficient policies is thus the entire unit simplex. We shall denote by P

the set of such policies¹.

Two special elements of P are the majoritarian and the proportional representation. Under a **majoritarian system**, if group i is the median group, the policy implemented is the one that results from assigning $p_i = 1$, $p_{j \neq i} = 0$. Therefore the policy implemented is

$$\alpha^{mj} = \tilde{\alpha}_i.$$

Under the **proportional system**, the policy implemented is

$$\alpha^{pr} = \sum_{i=1}^G p_i \tilde{\alpha}_i, \text{ where } p_i = 1/G.$$

We are interested in characterizing political systems that are socially stable, that is, that no group is interested to rebel against the system.

We define a status quo, sq , as the initial political system, characterized by a particular p . $u_i^{sq} = -|\alpha^{sq} - \tilde{\alpha}_i| \forall i=1, \dots, G$ is the utility of group i under the status quo.

Players decide whether to fight against the sq situation or not. The rebels will fight against the sq situation if the expected benefits from rebellion are positive. The aim of a rebellion is to change the current political system for a new one assigning weight 1 to the policy most preferred by the rebels. Therefore if group k rebels and wins, they will establish the political system with $p_k = 1$ and $p_i = 0 \forall i \neq k$, implementing $\tilde{\alpha}_k$ with probability 1. Notice that we are implicitly assuming that rebel groups act myopically in the sense that the winners impose their most preferred political system, irrespective of whether it is stable or not².

The direct expected gain from a rebellion is given by $\tilde{u}_i - u_i^{sq}$. If the rebellion fails the sq political system remains and the rebels are imposed a fix cost, c . Being a

¹ f corresponds to social decision functions in Esteban and Ray (2001).

²This model can be rewritten under more sophisticated hypotheses that assume that rebels have higher degrees of farfetchedness. However enriching the model in this direction leads to results that are qualitatively identical to the ones obtained under our shortsightedness assumption.

rebel has a fix cost F and gives a probability of success π . Taking all this information together we assume that groups will rebel if the expected net benefit exceed the expected cost. That is, the rebel will fight if,

$$\pi \tilde{u}_i + (1 - \pi)(u_i^{sq} - c) - F > u_i^{sq} \quad (4)$$

The left hand side of the inequality describes the expected utility of rebellion, and the right hand side represents the utility that the rebels have under the status quo.

Therefore, there will be a rebellion whenever

$$-u_i^{sq} > \delta, \text{ for some } i,$$

$$\text{where } \delta = [F + c(1 - \pi)]/\pi > 0.$$

By differentiation we obtain that $\partial\delta/\partial c > 0$, $\partial\delta/\partial F > 0$, $\partial\delta/\partial\pi < 0$

That is, groups will rebel if,

$$-u_i^{sq} = |\alpha^{sq} - \tilde{\alpha}_i| > \delta \quad (5)$$

Notice that groups face a dilemma. They either accept the status quo and get u_i^{sq} or engage in a rebellion and obtain the corresponding expected utility. Thus u_i^{sq} can be interpreted as the opportunity cost of rebellion to group i .

3.2 The Stability of Political Systems

As in Esteban and Ray (2001) we shall consider that a political system is stable if no group can be better off by triggering a rebellion.

Definition: A Political System p is **stable**, given $\tilde{\alpha}$, if the following inequality is satisfied for all groups,

$$-u_i^{sq} = \left| \sum_{j=1}^G p_j \tilde{\alpha}_j - \tilde{\alpha}_i \right| \leq \delta, \quad \forall i = 1, \dots, G. \quad (6)$$

The first question we address is if, for any given political situation $\tilde{\alpha}$, there exist stable political systems.

Lemma 1: *The necessary and sufficient condition for the existence of a stable political system is that,*

$$|\tilde{\alpha}_G - \tilde{\alpha}_1| \leq 2\delta \quad (7)$$

(Proof in the appendix).

Therefore, from now on, we shall restrict to situations for which stable political system exists.

The set of stable policies relative to $\tilde{\alpha}$, consists of all $p \in P$ vectors of the unit simplex satisfying the following inequality,

$$\tilde{\alpha}_G - \delta \leq \sum_{i=1}^G p_i \tilde{\alpha}_i \leq \tilde{\alpha}_1 + \delta \quad i = 1, \dots, G \quad (8)$$

Notice that the set of stable policies depends on $\tilde{\alpha}$. We shall say that a Political System is **Democratic** if p depends on group sizes and not on the particular value of the most preferred policies by the different groups. Since group sizes are assumed to be constant and equal, then a Democratic Political System is simply any vector of p that is not conditional on the particular vector $\tilde{\alpha}$. Proportional and Majoritarian systems are examples of Democratic Political Systems.

We shall now examine which democratic political system are stable. As a first step we shall verify the stability properties of these two well known democratic political systems.

Can the majoritarian or proportional systems fail to be stable? The answer is yes. Let us consider the following example: $G = 3$, $\frac{3}{2}\delta < |\tilde{\alpha}_3 - \tilde{\alpha}_1| \leq 2\delta$, and $\tilde{\alpha}_2 = \tilde{\alpha}_1 + \epsilon$. In this example the majoritarian system always yields the policy preferred

by group 2, the median voter, while the proportional corresponds to $p_1 = p_2 = p_3 = \frac{1}{3}$. Under this situation neither the proportional system nor the majoritarian system are stable. Under both political systems group 3 will rebel because $|\alpha^{pr} - \tilde{\alpha}_3| > \delta$ under proportional system, where $\alpha^{pr} = \frac{2\alpha_1 + \alpha_3}{3} + \epsilon$, and $|\alpha^{mj} - \tilde{\alpha}_3| > \delta$ where $\alpha^{mj} = \tilde{\alpha}_2$. That is, $\alpha^{pr}, \alpha^{mj} \notin [\tilde{\alpha}_3 - \delta, \tilde{\alpha}_1 + \delta]$, the group of stable policies.

Let us consider now the following complementary question. Given the political system -majoritarian and/or proportional- we are interested in characterizing the set of political situations, $\tilde{\alpha}$, for which it is stable. We shall continue with the case $G = 3$.

It is plain that under the majoritarian system, the median group has no incentive to begin a rebellion. Yet, the location of the median voter $\tilde{\alpha}_2$ does influence the resulting policy, which in turn determines the opportunity cost of rebellion for each of the extreme groups.

Lemma 2: *The majoritarian system is a stable political system if and only if the most preferred policy by the median voter belongs to the group of stable policies, that is, $\tilde{\alpha}_2 \in [\tilde{\alpha}_3 - \delta, \tilde{\alpha}_1 + \delta]$. In any other case either group one or three will have incentives to rebel.*

Lemma 3: *The proportional system is a stable political system if and only if the most preferred policy by the median voter satisfies*

$$\tilde{\alpha}_2 \in [2\tilde{\alpha}_3 - \tilde{\alpha}_1 - 3\delta, 2\tilde{\alpha}_1 - \tilde{\alpha}_3 + 3\delta] \quad (9)$$

(see proof in appendix)

Our next step is to compare the stability properties of these well-know political systems.

Proposition 1: *For all political situations for which the majoritarian system is stable, so is the proportional system, but not the other way around.*

Proof:

Define $R = \{0, 1\}$ as the event capturing whether a rebellion starts ($R=1$) or not ($R=0$)

$$\Pr(R = 0|majoritarian) = \Pr(\tilde{\alpha}_2 \in [\tilde{\alpha}_3 - \delta, \tilde{\alpha}_1 + \delta])$$

$$\Pr(R = 0|proportional) = \Pr(\tilde{\alpha}_2 \in [2\tilde{\alpha}_3 - \tilde{\alpha}_1 - 3\delta, \tilde{\alpha}_1 - \tilde{\alpha}_3 + 3\delta])$$

It is immediate that $[\tilde{\alpha}_3 - \delta, \tilde{\alpha}_1 + \delta] \in [2\tilde{\alpha}_3 - \tilde{\alpha}_1 - 3\delta, \tilde{\alpha}_1 - \tilde{\alpha}_3 + 3\delta]$,

Therefore, $\Pr(R = 1|majoritarian) = 1 - \Pr(R = 0|majoritarian) > \Pr(R = 1|proportional) = 1 - \Pr(R = 0|proportional)$

■

The previous result can be interpreted in the following way: suppose that the realization of $\tilde{\alpha}_2$ is a random drawing with a given probability distribution. In that case, for a particular political system the probability of rebellion is the probability that the value of $\tilde{\alpha}_2$ is outside the bounds that make that system stable. From the previous result follows that for any such probability distribution the probability of rebellion is higher under the majoritarian system than under the proportional.

Finally we analyze if there exists a political system that generates stable policies for any vector $\tilde{\alpha}$. Proposition 2 states the main result.

Proposition 2: *The Democratic political system $f(\tilde{\alpha}) = \frac{1}{2}\tilde{\alpha}_1 + \frac{1}{2}\tilde{\alpha}_3$ is the unique political system that is stable for any vector $\tilde{\alpha}$ and any δ such that $|\tilde{\alpha}_3 - \tilde{\alpha}_1| \leq 2\delta$.*

(Proof in the appendix).

This result says that the unique political system that is stable for all political situations and values of $\tilde{\alpha}$ is the one implementing the policy lying midway between the extreme groups, regardless of the position of the centre group. The intuition is as follows. It is evident that the extreme groups are the ones that most easily would rebel against a political system. Given the distance between the extremes, the implemented policy essentially depends on the political location of the centre group, as long as the system assigns any weight to the centre. It follows that the only class of systems whose outcome does not depend on the location of the centre is the one

assigning zero weight to the centre. It is straightforward that, within this class, the most stable one is the one giving equal weight to both extremes³.

3.3 Robustness of Political Systems

The previous results suggest that some systems are more stable than others. Which systems are stable and which are not depends on the size of δ . It is obvious that for δ large enough all systems are stable. Thus, an alternative way of ranking political systems is the size of the penalty δ needed to render them stable for all political situations. It seems straightforward that among stable political systems we should prefer those using minimum force.

From **Lemma 1** it is immediate that the key variable for political stability is $\frac{\delta}{\tilde{\alpha}_3 - \tilde{\alpha}_1} = \delta'$. In order to simplify notation we shall normalize to $\tilde{\alpha}_3 - \tilde{\alpha}_1 = 1$, and without loss of generality take $\tilde{\alpha}_1 = 0$.

A political situation will thus be fully described by $\tilde{\alpha} = \tilde{\alpha}_2$, and the normalized δ' , $(\tilde{\alpha}, \delta')$.

We have already observed that $\delta' \geq 1/2$ is necessary and sufficient condition for the existence of stable political systems. It is trivial to obtain that whenever $\delta' \geq 1$ all efficient political systems are stable. For intermediate values of δ' , the stability of any particular political system will depend on δ' and $\tilde{\alpha}$.

Definition: Let us say that a political system is robust if it is stable for all $\tilde{\alpha} \in]0, 1[$.

Clearly, the robustness of a political system will depend on δ' .

We have already seen that for $\delta' \geq 1$ all efficient political systems are robust. We wish to investigate the minimum δ' required to render a particular political system

³Notice that the assumption that parties cannot choose their location is essential here. Kalai(2000) has shown that in these circumstances if parties could act strategically, they would choose another location away from their true preferences towards the extremes. This type of strategic behaviour might render this political system unstable.

robust⁴.

For any specific political system p the condition for robustness is

$$1 - \delta' \leq p_2 \tilde{\alpha} + (1 - p_1 - p_2) \leq \delta' \quad (10)$$

for all $\tilde{\alpha} \in]0, 1[$. Therefore, p will be robust for δ' if

$$1 - \delta' \leq (1 - p_1 - p_2) \quad \text{and} \quad 1 - p_1 \leq \delta' \quad (11)$$

These conditions completely characterize the political systems that are robust relative to δ' .

Adding the two inequalities (10) and (11), we obtain,

$$p_2 \leq 2(\delta' - 1/2) \quad (12)$$

From this condition we deduce that the weight attached to the median group decreases as we decrease the cost of rebellion δ' . In the limit, as $\delta' \rightarrow 1/2$, $p_2 \rightarrow 0$, and p_1 or $p_3 \rightarrow 1/2$.

It is easy to see that the minimum value for δ' is $1/2$.

Lemma 4: *if $\delta' \geq 1 - \min\{p_1, p_3\}$ then the political system p is robust. That is, is stable for any $\tilde{\alpha} \in]0, 1[$.*

It is obvious that this can be written in the following way: if $p_2 \leq 2(\delta' - 1/2)$, then the political system p is robust.

⁴This is somewhat parallel to the role of punishment in the Economics of Law. Arbitrarily large penalties can enforce any rule. Yet, we would like to characterize the minimum penalty that induces compliance with the law.

Definition: δ'_m is the minimum penalty that makes p robust. δ'_m is

$$\delta'(p)_m = 1 - \min\{p_1, p_3\} \quad (13)$$

From here we have the following result.

Proposition 3: *Let us consider a given political system p . Then, any alternative political system \hat{p} assigning less weight to the mid group and more to the extremes can be made robust with a lower penalty, that is $\delta'(p)_m \geq \delta'(\hat{p})_m$*

From the previous result Corollary 1 and 2 follow immediately.

Corollary 1: *The proportional system needs a lower penalty to be robust than the majoritarian system,*

$$\delta'(\text{majoritarian})_m = 1 - \min\{0, 0\} = 1$$

$$\delta'(\text{proportional})_m = 1 - \min\{1/3, 1/3\} = 2/3$$

$$\text{therefore } \delta'(\text{majoritarian})_m > \delta'(\text{proportional})_m$$

This means that in order to prevent a rebellion, the majoritarian system needs to impose a higher penalty than the proportional system. This result completes our previous findings on the probability of civil war, where for a given δ the majoritarian system has a higher probability of rebellion than the proportional system in terms of the location of the median group. This is because the opportunity cost of rebellion under the majoritarian system is lower than under the proportional system. Therefore the penalty in order to prevent groups starting a rebellion is higher when the opportunity cost of rebellion is lower.

Corollary 2: *Every political system p with $p_2 > 0$ can be weakly dominated by a system p' with $p'_2 = 0$ and $p'_1 \geq p_1$ and $p'_3 \geq p_3$. It is immediate that among political systems with $p_2 = 0$, the one with $p_1 = p_3 = 1/2$ minimizes $\delta'(p)_m$.*

$$\text{Furthermore, } \delta_m^* = 1 - 1/2 = 1/2 \quad (14)$$

Figure 1 shows this result. The penalty cost is represented in the horizontal axis, and the location of the median voter on the vertical axis. Each political system can be represented in this graphic. For a given political system, each point in the figure 1 represents the minimum penalty needed for being stable for a given location of the median voter. Notice that for each possible location of the median voter, the majoritarian is the political system that needs to implement a larger minimum penalty for being stable. Moreover, we can also see in the figure the value of δ that guarantees the robustness of each political system.

The relationship between democracy and development has attracted interest. Most of the recent work focuses on the eventual role of democracy in promoting growth. On this specific point we do not have much to say. But, it has also been argued that democracies are stable in rich countries because challengers would face a higher cost. In our model this would correspond to high values of δ' .

Accordingly with our analysis, it is indeed the case that increases in δ increase the set of robust political systems. This is true of all systems, democratic or not. The merit is to be found in the rising cost rather than in the virtues of the political system.

The one system that stands as robust under all admissible δ is the Aristotelian mid point between the extremes⁵.

⁵For Aristotle the concept of Justice is the mid point between two extremes. This concept of justice appears intimately associated with his doctrine of the systems of government. For Aristotle justice is an internal factor of the constitution of the State. Considering the idea that justice is a mid point between two extremes, for him the political situation that captures better the concept of Justice is the one based on the middle-class. Aristotle claims the idea of the intermediate regime as a model that reflects his concept of Justice.

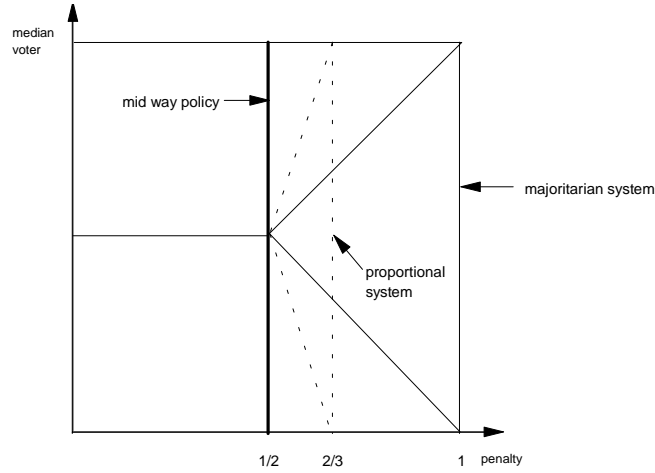


Figure 1:

3.4 Further results for the case of different group sizes

Proposition 1 shows the relationship between political systems and the probability of rebellion when the median policy $\tilde{\alpha}$ is located between the two extremes. This comes from the assumption that the three groups have the same size. Once we drop such stringent assumption and let groups have different sizes, the median voter can be located at any of the three potential positions. Let us assume that each variable α can be interpreted as the preferences of group i . We order the preferences of individuals $\alpha_1, \alpha_2, \alpha_3$ where each of them can be interpreted as independent realizations of the distribution of α . To formalize this argument, define $R = \{0, 1\}$ as the event capturing whether a rebellion succeeds ($R=1$) or fails ($R=0$). Under a majoritarian system the policy imposed is the median $\tilde{\alpha}$. Under a proportional system the policy imposed is $\bar{\alpha}$, the mean. Moreover, we know from the model that a group will start a rebellion if $|\alpha_{median} - \tilde{\alpha}_i| > \delta$, for any i , under a majoritarian system, and $|\bar{\alpha} - \tilde{\alpha}_i| > \delta$ under a proportional system.

Let $G(\cdot)$ be the cdf of α , and $g(z)$ be the density function of the distribution of the α 's, and let

$$H(z) = G(z + \delta) - G(z - \delta)$$

The $\Pr(R = 1|majoritarian)$ can be calculated as

$$\Pr(R = 1|majoritarian) = 1 - \int H(z)^2 g^m(z) dz = 1 - \int H(z)^2 6(G(z)(1-G(z))g(z) dz$$

where $g^m(z)$ is the distribution of the sample median, that for $n = 3$ turns up to the following expression $g^m(z) = 6(G(z)(1 - G(z))g(z)$.

In order to calculate the $\Pr(R = 1|proportional)$ we need to consider the distribution of the sample mean, as we consider the distribution of the sample median for the case of a majoritarian system.

$$\Pr(R = 1|proportional) = \int_R P[\alpha_1 \in (x - \delta, x + \delta), \alpha_2 \in (x - \delta, x + \delta), \alpha_3 \in (x - \delta, x + \delta) | \bar{\alpha} = x] f_{\bar{\alpha}}(x) dx$$

To compute the distribution of the sample mean we need to use a convolution, given that it is essentially a sum.

$$f_{\bar{\alpha}}(z) = (1/3) \iint f_{\alpha_1}(x) f_{\alpha_2}(y - x) f_{\alpha_2}(z - y) dx dy$$

Where $f_{\bar{\alpha}}$ is the distribution of the sample mean and $\bar{\alpha}$ is the sample mean. The distribution of the sample mean, $f_{\bar{\alpha}}(z)$, is quite a complicate mathematical object. It is not clear that there is a way to derive an analytical expression that could be compared with the probability of rebellion under a majoritarian system. Therefore, as in many other cases where an statistic has an intractable analytical expression, we have simulated both statistics for two particular distributions as an illustration. Figure 2 and 3 show graphically the comparison of the probability of rebellion for both political systems under a uniform and normal distribution for the preferences. In the x-axis we show the value of δ . In the y-axis we depict the $\Pr(R = 1)$ under

each system. The results show that the probability of rebellion under a proportional system is always lower than the probability of rebellion under a majoritarian system for any δ except for two cases, $\delta = 0$ and δ very large. When δ is zero, which means that there is no cost of rebellion, in both systems groups have incentives to begin a rebellion. When the cost of rebellion is very large, then in both cases no group will begin a rebellion. This is consistent with the model.

Fact 1: If the distribution of the α 's is uniform or normal, the probability of rebellion under a majoritarian system is higher than the probability of rebellion under a proportional system.

This result thus illustrates the relationship between the probability of rebellion under a proportional and a majoritarian system given a particular distribution of preferences of social groups in the population. This fact is obviously conditional on the choice of the distribution of the α 's. Other simulations would be required to generalize these results to different distributions, including some asymmetric ones. In any case, the fact that the uniform and the normal distribution are very popular among theorists guarantees the result for these two important cases.

The hypothesis we want to test is that the political system is an important factor in determining the probability of civil wars, and that democracy does not protect countries from violence. The basic idea is that in countries with high levels of democracy, the representation of voters is different, and this can be captured by the voting rule. And the level of representation of voters implies different opportunity cost of rebellion and, therefore, this will be important in explaining social conflict, and social violence. The key point is that systems in which the distribution of power in government is more close to the distribution of groups in society have less probability to start a civil war because the opportunity cost of rebellion is higher. The better way to achieve this is to introduce proportional representation election.

4 AN EMPIRICAL INVESTIGATION ON THE CAUSES OF CIVIL WAR

4.1 The data

We use data from Doyle and Sambanis (2000), (DS). They define a civil war as an armed conflict which meets all the following conditions: the conflict has (a) caused more than one thousand deaths; (b) it has changed the sovereignty of an internationally recognized state; (c) it occurred within the recognized boundary of that state; (d) it involved the state as a principal combatant; (e) it include rebels with the ability to mount organized armed opposition to the state; and (f) the parties were concerned with the prospect of living together in the same political unit after the end of the war. This definition allows them to combine data on wars from several data-sets. This definition is nearly identical to the definition of Singer and Small (1982;1994) and Licklider (1993;1995)

4.1.1 Political variables

There are different sources of data on the level of democracy. The FreedomHouse data source bases the level of democracy on the level of civil liberties and political rights. This data, usually referred to as Gastil's index of democracy, has been the most commonly used among economists. The disadvantage of this source is that it does not provide data before the 70s. A more recent work on levels of democracy data is provided by the Polity III project. Scales of democracy and autocracy were created through the aggregation of authority characteristics, reflecting the influence dimensions of authority, the recruitment of chief executives, and the centralization of government structure⁶. Even though the criteria for the construction of these databases are different, they look very similar and the correlation among them is

⁶See: <http://www.colorado.edu/IBS/GAD/spacetime/data/Polity.htm>.

about 0.9.

However there is no time-series cross-section data collected on the political institutions of the country concerning political systems.

In order to contrast our hypothesis we need to construct a time series of cross-section data. We use as the basic source of information data in Colomer(2000). He takes data for 123 attempts at democratization and major democratic institutional changes in 84 countries with more than one million inhabitants during the 125 years-period, 1894-1999. He distinguishes the following categories of democratic institutional formulas: parliamentary-majoritarian, presidential and semipresidential, and parliamentary-proportional representation. Institutional changes are grouped in the three historical periods, or democratizing ‘waves’, usually establish: 1874-1943, 1944-1973, 1974-1999. In this data, the number of institutional changes recorded are 31 in the first wave, 49 in the second wave, and 43 in the third wave. The numbers of successful attempts at democratization, which is to say, the numbers of presently existing democracies which were established in the different periods, are increasing: 9 from the first wave, 18 from the second wave, and 36 from the third wave. The countries he considers are the ones that are considered to be free by the Freedom-House data source. Using this study we generate a time series of cross-sections for 138 countries from 1960 to 1995, organized in five-years periods.

We capture the democratic rule of the countries at the beginning of each period using the data in Colomer(2000). Moreover, for the non-free countries we used data from the FreedomHouse and PolityIII data source. Therefore we obtain five possible categories that define five dummy variables: non-free, partly-free, parliamentary-majoritarian, presidential and semipresidential, and parliamentary-proportional.

4.1.2 Control variables

In order to proxy the loot of rebellion we use, as Collier and Hoeffler (1998 and 1999), the share of natural resources on exports in GDP. The data on primary exports comes

from the World Development Indicators (WDI).

In order to proxy the opportunity cost we take data on income per capita from the Penn World Table (pwt56). The education data comes from Barro (1996), and represents the average years of schooling in the total population.

In order to proxy the demand for justice and the cost of coordination, we use data on linguistic and religious fragmentation and the size of the population following Collier and Hoeffler (1998,1999). The data on linguistic fragmentation comes from the well-know index of Taylor and Hudson and the data on religious fragmentation comes from Barro (1997), which uses the same index as the linguistic fragmentation but with religious data⁷.

4.2 Preliminary findings

Civil wars is one of the most important forms of political violence that history has showed. The effort in trying to implement peaceful agreements in potentially conflictive societies is not a new issue. However, political rights and civil liberties has been taken as the solution even though the empirical evidence about this not clear. There is at least one reason to believe that high levels of democracy are not a vaccine against the beginning of a civil war: countries with high levels of democracy also experience civil war.

Using the sample of 138 countries, Barro and Lee (1994), and data on civil wars from Sambanis and Doyle (2000), we find, as can be seen in Table 1, 68 cases of starting civil wars from 1960 until 1994. Half of them, 52%, occurred in countries with high levels of autocracy, the ones considered to be not free in the FreedomHouse database. However, 22% of them occurred in completely free countries, with high levels of civil liberties and political rights.

The proportion of cases that started the period with an autocracy and experienced

⁷The inclusion of other variables as growth rate or indices of income inequality do not alter the main results we find.

a civil war is 11%. The most interesting thing is to compare this percentage with one of the free countries in which civil war started. As we expected, the proportions of cases that start the period with a free system and experience a civil war is lower, just 4%. The interesting observation is to look at the characteristics of free countries where civil war occurred. If we distinguish these countries with respect to the different political systems, we find interesting results. In 8,3% of the cases that started the period with a majoritarian system, a civil war started during the next 5 years. 7% of the cases with Presidential system also experience a civil war. However, none of the countries with proportional system of our sample experienced a civil war. Moreover, we have more or less the same number of cases that had a majoritarian system, a presidential system and a proportional system, as can be seen in Table 1. These are just preliminary results, but illustrate very well some of the intuitions developed before.

But why is freedom not enough to ensure peace? Because the opportunity cost of rebellion in the different political systems is not the same. This is lower as less inclusive is the voting rule. In majoritarian systems, the opportunity cost of rebellion is lower than in a proportional system. In a less inclusive rule the fact that the opportunity cost of rebellion is lower, increases the probability of rebellion.

The idea, behind this intuition is that the political system is more important in protecting democratic countries from violence than just the level of freedom. The objective of the following sections is to analyse empirically, using an econometric specification, which is the effect of political systems in preventing or reducing the probability of civil wars.

4.3 Regression results

Given the nature of the data, the econometric specification should accommodate a discrete variable with the panel data structure. For this purpose a reasonable choice is the logistic model with individual effects.

To analyze the effect of political systems on the probability of a civil war we adopt a general specification derived from the looting and justice seeking model, including alternative explanatory variables in order to show the generality of our findings. We control first for the variables that are said to capture better the looting and justice seeking model, which are the ones that Collier and Hoeffler (1998 and 1999) found to be important causes of civil war. For all the empirical exercises we consider a sample of 138 countries and data from 1960 to 1995, organized in periods of five years. All the independent variables are taken at the beginning of the period. The dependent variable is a dummy which takes value one if a civil war has started during the period and zero otherwise⁸.

As a first step we analyze if the level of democracy has a significant effect in explaining the probability of civil war. Table 2 shows the results of the logit panel data estimation using the set of variables proposed by Collier and Hoeffler (1998 and 1999), columns 1 to 5, and using alternative variables, columns 6 to 8. As we suspect, the level of democracy, from the Polity III database, does not have a clear effect, neither does the autocracy level, columns 2 and 3.

As an alternative, instead of including the level of political openness, we analyze the effect of being not free (AUTOC), being partially free (PF), and being free (Freedom), following the Freedom House dataset. Column 4 shows how being not free is not an important variable explaining civil wars compared with being partially free or completely free. Moreover, column 5 shows how being free is not a variable that prevents countries from civil wars. This corroborates the results we found when analyzing the democracy variable using the Polity III dataset. It seems that having political rights and civil liberties is not enough to prevent civil wars.

A surprising result is the poor explanatory power of the proxy for natural resources, opposite to the findings in Collier and Hoeffler (1998, 1999). They find that

⁸Since we are interested in studying the role of political systems on the beginning of a civil war we do not study the effect on the duration of a civil war.

natural resources are an important variable in explaining the incidence of civil war. This difference on the results could be caused by the different sample we used and also the different dataset on civil wars. Moreover it is interesting to mention that, even though we do not present the results here because is not the purpose of this study, we find natural resorcers to be a very importnat variable in explaining the incidence of other kind of political violence such as coups or revolutions. In order to show the robustness of our results we control for other variables. The economic variables added are the investment share of GDP and the consumption share of GDP, which are not directly related to the looting and justice seeking model. The idea behind the inclusion of these variables is that, probably if the country is using the resources for investment and consumption, the opportunity cost of the resources dedicated to support violence is higher. In other words, if the country can invest and people can consume and therefore increase their utility, the opportunity cost of fighting is higher. We also include variables that reflect the social fragmentation, as the product of linguistic and religious fragmentation, following Collier and Hoeffler (1998 and 1999). However, every time we include this cross product in the regression we also include the level of religious and linguistic fragmentation separatelly⁹. Finally, in order to control for the region we introduce dummy variables for sub-Saharan, Asian and Latin America countries. Many of the civil wars take place in Africa and, therefore, including these variables we want to see if there is still some effect that is not captured by the fact of being an African country.

Columns 6, 7 and 8 of table 2 show that even controlling for all these alternative variables, the level of democracy and freedom is not a vaccine against civil wars. Surprisingly, we find a negative effect, although not significant, of the level of autocracy on the probability of civil war (column 8, table2). The interpretation maybe that for

⁹However, using only the cross product alone the results are the same. Moreover using only the level of religious fragmentation and the level of linguistic fragmentation separately the results are also the same.

starting a civil war some level of freedom is needed to let people organized.

4.4 Political systems and the prevention of civil war

We have shown that democracy seems not to be a sufficient condition to prevent countries from getting involved in a civil war. We now introduce the institutional variables created in this paper. We define Autocracy (AUTO), partially free (PF), majoritarian system (MAJO), presidential system (PS) and proportional representation (PR). In the first step we analyze the effect of the different institutional systems using dummy variables. However, because there is no country that has a proportional system and experience a civil war during the next five years, the prediction power of this dummy is perfect. This fact makes the logit panel a badly defined specification. Therefore, in order to avoid this problem we construct variables which order the different systems according to the level of inclusiveness of their voting rules.

For the political institutional, we try to summarize in one variable the information contained in the five dummies referred to before. We try to order the five dummies in respect of the inclusiveness of the system. The most inclusive rule is unanimity. We know that non-free systems are less inclusive than non-authoritarian countries, and that plurality systems are less inclusive than proportional representation systems. A number of countries have presidential systems. The theory does not incorporate this directly. However there is a sense in which societies with Presidential systems and proportional system in the assembly are more inclusive than pure majoritarian systems. By definition the election of the president is by majority rule, therefore what makes the difference between presidential systems is the voting rule followed in the assembly. It would be ideal to have data that distinguish between the kind of presidential systems in terms of their different level of inclusiveness depending on the voting rule followed in the assembly. However we do not have this data, therefore if we order the systems by the level of inclusiveness, presidential systems are less inclusive than proportional representation and equal or more inclusive than majoritarian rule

systems, depending in the voting rule that is followed in the assembly elections. Therefore we create a variable called VAR, such that has value 0 if the system is non free, 1 if it has a majoritarian system, 2 if it has a presidential system and 3 if it has a proportional system. Alternatively, mainly because following this order is difficult to ensure that presidential systems are more inclusive than majoritarian, we create another variable, called VAR1 such that has value 0 if the country is not free, 1 for majoritarian and presidential systems and 2 for proportional systems.

In table 3 we analyze the effect of the level of inclusiveness using the set of explanatory variables from the looting-justice seeking model, columns 1 to 2, and including alternative explanatory variables, columns 3 to 8.

The difference between VAR and VAR1 is that in the first variable the presidential system is considered to have higher inclusiveness than the majoritarian system. However, in the variable VAR1 they are considered to have the same level of inclusiveness.

The first two columns corroborate as before that the variable that proxies natural resources has no effect. Column 1 shows that VAR has a negative effect in explaining civil war. VAR1 also has a negative and significant effect on the probability of civil war. In order to show the robustness of this result we introduce more economic variables, column 3 and 4. The results show that controlling for those additional variables, VAR and VAR1 have a negative and significant effect on the probability of civil wars. These results are important not only because they corroborate the results obtained using the standard looting-justice seeking model, but also because they are more robust given the presence of additional variables and more observations¹⁰. In columns 6 and 7, we control also for social fragmentation. The introduction of these new variables does not modify the effects of the political system variable on the probability of civil wars. Finally, in the last two columns of table 3, we include the regional variables. We find again a negative and significant effect of the level

¹⁰Primary exports have not been included because there are few countries that have these data and, therefore, if it used there is a large reduction in the number of observations.

inclusiveness on the probability of civil war.

In all the empirical exercises we control for the level of autocracy, that turns out to have a negative and significant effect on the probability of civil war. All these results show that the political system is more important than the level of democracy in preventing a civil war.

From the results on table 2 and 3 one could suspect that there are some democratic systems that can have the same probability of civil war than non democratic systems. There are two reasons to expect this. First of all we show that freedom does not prevent countries from violence. However, as more inclusive is the voting rule, the less probable is a civil war. Moreover, even if the countries with the more inclusive voting rules are democracies, there exist democratic countries with systems where the level of inclusiveness is not very high, such as majoritarian system. However, the interaction between democracy and the voting rule generates different levels of prevention against civil wars. Second, we find that some level of freedom is needed in order to generate the minimal conditions for a civil war to begin. The combination of freedom and non-inclusiveness seems to be the worst system.

In order to analyze these facts we consider the interactions between the level of inclusiveness and the level of freedom (table 4). In columns 1 and 2 we use the level of democracy, and in columns 3 and 4 the level of autocracy. Columns 1 and 2 shows that the level of inclusiveness in countries without democracy do not affect the probability of civil wars. This is because in countries with a low level of democracy the intensity of inclusiveness is the same no matter how autocratic or democratic is the country. However in democratic countries the level of inclusiveness of the voting rule has a negative and significant effect on the probability of civil war. Moreover this results indicate that the higher is the level of democracy in the country, the larger is the effect of the level of inclusiveness on civil war. These results corroborate what we obtain using the level of autocracy instead of democracy (columns 3 and 4).

Because no country with a proportional system suffered a civil war, we have a

perfect prediction of the effect of this system on the probability of civil war. Therefore, in order to continue analyzing other systems we drop the observation that has a proportional system. The results of introducing the four dummy variables describing the systems (autocracy (AUTO), partially free (PF), majoritarian (MAJO) and presidential (PS)) are presented in table 5. PF system has a larger probability of civil war relative to autocracy, as it can be seen in column 1. This result is related to the intuition we mentioned before. It seems that low inclusiveness and a little freedom is a fruitful setting for a civil war. Surprisingly the majoritarian and the presidential systems, which exist in many democratic countries, have the same effect as autocracy on the probability of a civil war.

In order to control for the level of democracy, we introduce in column 2 the interactions between the political system and the level of democracy. The effect of a partially free system on civil war relative to autocracy does not change independently of the level of freedom of the country. It always has a larger probability of civil war relative to autocracy. Partially free countries have a level of freedom ranging between low and intermediate.

The same happens with the majoritarian system. Majoritarian systems exist in free countries, the ones that have high levels of freedom. Does the effect of a majoritarian rule on the probability of a civil war change when the system is completely free? The answer is no. Having a majoritarian system with less freedom has the same effect on civil wars as a majoritarian system with a high level of freedom, and this effect is not significantly different from having an autocratic system.

However, from column 2 we can observe that presidential systems work in a different way. Under low levels of democracy, the presidential system seems to have a positive and significant effect on the probability of civil war relative to autocracy. However, when the country reaches the highest levels of democracy this effect disappears.

These results shows the need to control not only for the level of democracy but

also for the political system. Not all political institutions work in the same way, and from the analysis mentioned above the level of representation of the population is a key element if we want to prevent countries from civil war. Freedom is needed, but it seems to be less important if the political system is not appropriate. The conclusion from the analysis is that political systems with high level of inclusiveness seems to be more appropriate to prevent countries from civil war. This inclusiveness can be achieved applying consociational democracies rather than majoritarian systems.

4.5 Sensitivity analysis

In this section we want to check the results obtained with the inclusion of some historical variables, together with some proxies of dissatisfaction with the government, and some development measures in order to clarify, once again, the importance of the political system in preventing a civil war.

We consider as one important historical variable that can also determine the future political system of the country, the fact of having been a colony. The reason to include this variable is that it can affect the probability of civil war because one common characteristic of colonies is that colonists divide power following their own interest, sometimes inducing violence. Moreover, the colonial structure has an important influence in the development of the political institutions of the country. Therefore it could be that the effect of the political system variable is captured by the history of the country, more concretely the fact of being an old colony.

Another historical variable that influence the definition of the political institutions is religion. Therefore a good proxy for this effect is a dummy variable that characterize the main religion of the country.

The second group of variables that we want to control for are proxies for the dissatisfaction with the government. The two measures selected are government crises and antigovernment demonstrations. Countries that experience civil war have a high probability to have experienced government crises and antigovernment demonstra-

tions. Therefore one could think that the dissatisfaction together with other factors such as low growth rate, high rates of inflation or a larger number of assassinations can be more important in inducing a country into a civil war rather than just the political system by itself. Therefore we also check the importance of all these variables.

The results in table 6 show that, even with the inclusion of all these additional variables, the political system has a significant effect on the probability of civil war, suggesting that the representation of voters is a very important element to take into account if we want to find policies that reduce the probability of civil wars, mainly in heterogeneous societies with ethnic differentiation, where the distances among social cleavages could be larger, and, therefore, following the model, the probability of rebellion increase, suggesting that, on those societies, the introduction of consociational democracies can help in reducing the probability of civil war.

5 CONCLUSION

This paper analyses the role of political systems as a mechanism that can prevent or reduce violence. We show theoretically and empirically how alternative political systems have different probabilities of experiencing a civil war.

We construct a simple model that captures the basic relation between a political system and the probability of rebellion. The main result is that the probability of rebellion decreases with the expected utility of the rebel group under the status quo system, which can be interpreted as the opportunity cost of rebellion. According with our model the proportional system has a lower probability of rebellion than majoritarian system. The intuition behind this result is that under the proportional system the opportunity cost of rebellion is higher than under the majoritarian system. Moreover we also find that given a political situation, majoritarian systems need to have higher penalties than proportional system to prevent rebellions. This result corroborates the idea that for a given political situation and penalty, majoritarian

systems have a higher probability of rebellion.

The main finding is the importance of the combination of the system of representation of the voters in government and freedom or democracy in order to prevent countries from civil war. We argue that what matters is the representation system of the voters in government. Empirically we found that the more inclusive the system the smaller the probability of suffering a civil war.

This result solves the puzzling results on the effect of the democracy on the probability of civil wars. We observe that some countries with high levels of democracy experience violence, and therefore the fact of having high levels of civil liberties and freedom do not seem to protect countries from violence. Freedom is not a sufficiently effective vaccine against violence, even if it is necessary.

We show how these results are robust to different explanatory variables. This means that the political system, which determines the level of inclusiveness, is an important political factor in reducing the probability of civil war.

Moreover we find that being Partially Free, accordingly with Gastil's measure of democracy, has a higher probability of civil war relative to having autocracy. Having a majoritarian system with less freedom has the same effect on civil wars as a majoritarian system with a high level of freedom, and this effect is not significantly different from having an autocratic system. However presidential systems work in a different way. Under low levels of democracy, the presidential system seems to have a positive and significant effect on the probability of civil war relative to autocracy. However, when the country reaches the highest levels of democracy this effect disappears.

Future lines of research should focus more on the difference between the causes of civil war and the causes of other forms of political violence such coups d'état and revolutions. Moreover a deeper study on the social causes of civil war and its interaction with political institution is needed.

APPENDIX 1

Proof of Lemma 1: Necessity is immediate. As for sufficiency start by noting that the set of policies against which neither of the two extreme groups will rebel is given by $(\alpha_G - \delta), (\alpha_1 + \delta)$, which is non empty.

The set of acceptable policies for group k , is $\alpha \in [\alpha_K - \delta, \alpha_K + \delta]$.

It is immediate that $[\alpha_G - \delta, \alpha_1 + \delta] \in [\alpha_K - \delta, \alpha_K + \delta] \quad \forall k$.

Therefore, since is acceptable for all group, it is stable. ■

Proof of Lemma 3: Under the proportional system, the policy established is the mean $\bar{\alpha} = \frac{\tilde{\alpha}_1 + \tilde{\alpha}_2 + \tilde{\alpha}_3}{3}$. The proportional system is stable if $\tilde{\alpha}$ is a stable policy, that is, if $\bar{\alpha} = \sum_{i=1}^3 \frac{1}{3} \tilde{\alpha}_i = \frac{\tilde{\alpha}_1 + \tilde{\alpha}_2 + \tilde{\alpha}_3}{3} \in [\tilde{\alpha}_3 - \delta, \tilde{\alpha}_1 + \delta]$.

Let us now characterize the values of $\tilde{\alpha}_2$ -the preferences of the median voter- for which the proportional system is stable. Clearly, the proportional system is stable if and only if $\alpha^l = \tilde{\alpha}_3 - \delta \leq \bar{\alpha} = \frac{\tilde{\alpha}_1 + \tilde{\alpha}_2 + \tilde{\alpha}_3}{3} \leq \tilde{\alpha}_1 + \delta = \alpha^u$.

Rearranging we have

$$2 \tilde{\alpha}_3 - \tilde{\alpha}_1 - 3\delta \leq \tilde{\alpha}_2 \leq 2 \tilde{\alpha}_1 - \tilde{\alpha}_3 + 3\delta$$

■

Proof of proposition 2:

Proof of existence:

For $p = \{1/2, 0, 1/2\}$, the policy implemented is $\alpha = \sum_{i=1}^3 p_i \tilde{\alpha}_i = \frac{\tilde{\alpha}_1 + \tilde{\alpha}_3}{2}$, for any $\tilde{\alpha}_2$.

We check if this policy belongs to the set of stable policies, that is, if $\frac{\tilde{\alpha}_1 + \tilde{\alpha}_3}{2} \in [\tilde{\alpha}_3 - \delta, \tilde{\alpha}_1 + \delta]$. It is easily to check that these two inequalities are satisfied :

$$\frac{\tilde{\alpha}_1 + \tilde{\alpha}_3}{2} \geq \tilde{\alpha}_3 - \delta$$

$$\frac{\tilde{\alpha}_1 + \tilde{\alpha}_3}{2} \leq \tilde{\alpha}_1 + \delta$$

Both are satisfied if $|\tilde{\alpha}_3 - \tilde{\alpha}_1| \leq 2\delta$, which is a condition for the existence of stable policies.

Proof of uniqueness:

Suppose that there exists another political system p' , such that generates a stable policy for some vector $\tilde{\alpha}$ and δ , such that $|\tilde{\alpha}_3 - \tilde{\alpha}_1| \leq 2\delta$. If this is true, it also has to be stable when $|\tilde{\alpha}_3 - \tilde{\alpha}_1| = 2\delta$. Notice that under this case, the set of stable policies is composed by one policy,

$$[\tilde{\alpha}_3 - \delta, \tilde{\alpha}_1 + \delta] = \tilde{\alpha}_3 - \delta = \tilde{\alpha}_1 + \delta = \frac{\tilde{\alpha}_1 + \tilde{\alpha}_3}{2}$$

For any $\tilde{\alpha}_2$ the political system p' , will assign policy $\frac{\tilde{\alpha}_1 + \tilde{\alpha}_3}{2} = \sum_{i=1}^3 p_i \tilde{\alpha}_i$. This is a linear convex combination of the $\tilde{\alpha}$. For a given $\tilde{\alpha}_1$ and $\tilde{\alpha}_3$, for different $\tilde{\alpha}_2$ the set of political systems that assigns the stable policy change. Therefore, the only political systems that are in the group of stable political systems for each $\tilde{\alpha}_2$, are ones such that $p_2 = 0$.

Therefore $p' = \{p_1, 0, p_3\}$.

It is immediate that $p' = \{1/2, 0, 1/2\}$, it is the only convex combination that gives the stable policy $\frac{\tilde{\alpha}_1 + \tilde{\alpha}_3}{2}$.

Therefore this political system is unique ■

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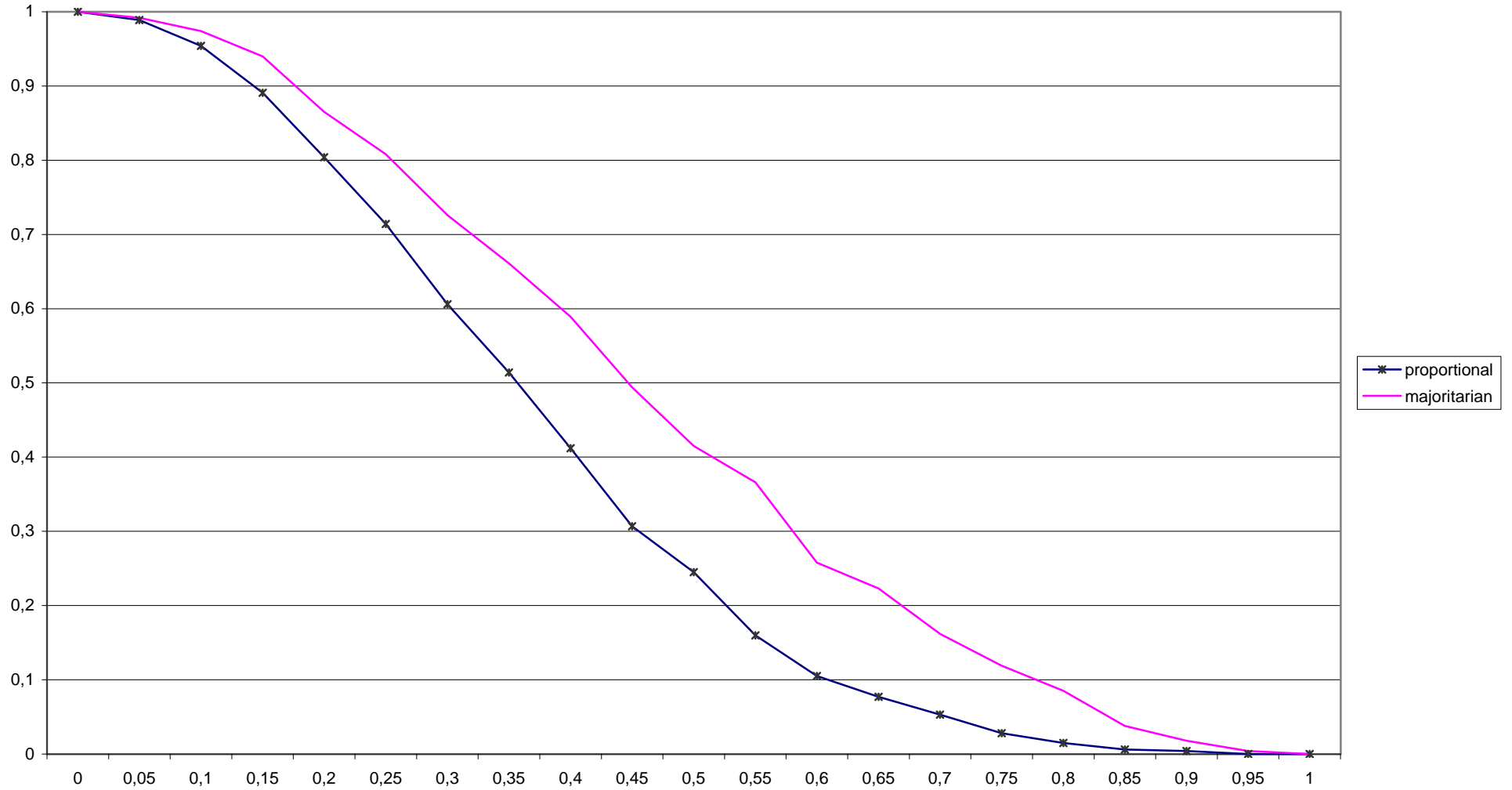
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Bootstrapping the probability of rebellion (uniform distribution)
Proportional versus majoritarian system



Bootstrapping the probability of rebellion (normal dist.)
Proportional versus majoritarian systems

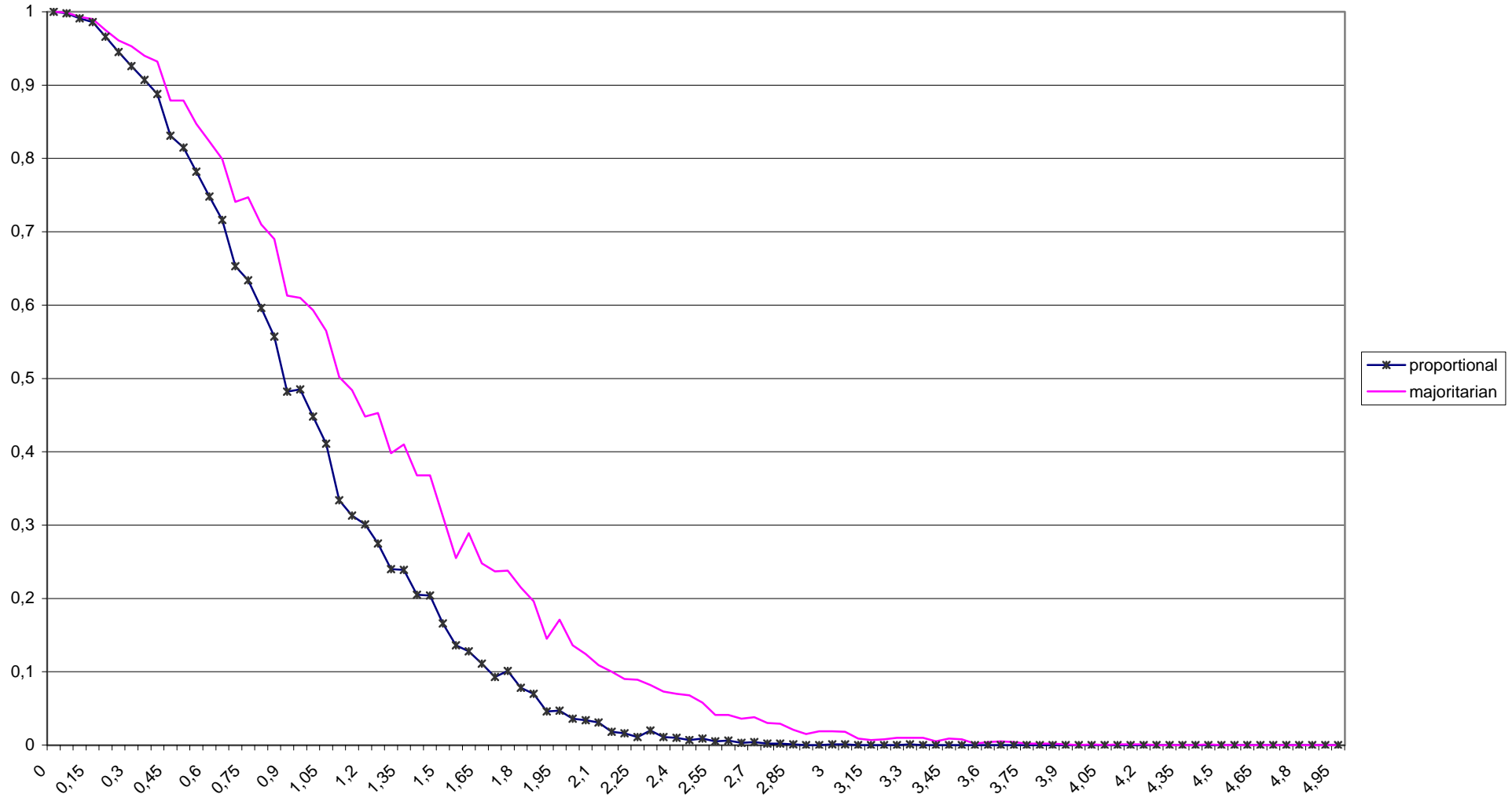


TABLE 1

Civil war and political system from 1960 to 1995. Table of frequencies.

LEVEL OF FREEDOM AT THE BEGGINING OF THE PERIOD	POLITICAL SYSTEM UNDER FREEDOM AT THE BEGGINING OF THE PERIOD	NUMBER OF CASES UNDER THE POLITICAL SYSTEM	PERCENTAGE OF CASES IN WHICH A CIVIL WAR STARTED DURING THE PERIOD
AUTOCRACY		309	11.6%
PARTIALY FREE		173	9.8%
FREE			4%
	MAJORITARIAN	96	8.3%
	PRESIDENTIAL	101	6.9%
	PROPORTIONAL	92	0

Civil War since 1960, Using the barrolee 138 countries, and data from Doyle and Sambanis

COUNTRY	War start	War finish	War start	War finish	
Afghanistan	78	92	Jordan	71	71
Afghanistan/Taliban	93		Kenya	91	93
Algeria	62	63	Liberia	89	92
Algeria	92	97	Liberia	93	96
Angola	75	91	Mali	90	95
Angola	92		Mexico/Chiappas	92	94
Bangladesh/Hill	73	94	Morocco/W.Sahara	75	89
Burma	68	82	Mozambique	79	92
Burma	83	95	Nicaragua	78	79
Burundi	65	69	Nicaragua	81	89
Burundi	72	73	Nigeria/Biatra	67	70
Burundi	88	88	Nigeria/Muslim	80	84
Burundi	91		Pakistan/Bangladesh	71	71
Cambodia	70	75	Pakistan/Blch.	73	77
Cambodia	79	91	Papua New Guinea	88	91
Central Africa	95	97	Peru	80	96
Chad	65	79	Philippines/MNLF	72	96
Chad	80	94	Philippines/NPA	72	92
China	67	68	Romania	89	89
Colombia	78		Rwanda	63	64
Congo/Brazzaville	92	96	Rwanda	90	94
Congo/Zaire	60	65	Sierra Leone	91	96
Congo/Kisangani	67	67	Somalia	88	91
Congo/shabba I, II	75	79	Somalia	92	
Congo/Zaire	96	97	South Africa	76	94
Cyprus	63	64	SriLanka/JVPI	71	71
Cyprus	74	74	SriLanka/Tamil	83	
Djibouti	91	95	SriLanka/JVP II	87	89
Dominican.Rep.	65	65	Sudan	63	72
El Salvador	79	92	Sudan	83	
Ethiopia/Eritrean	74	91	Thailand	67	85
Ethiopian/Ogaden	77	85	Turkey/Kurds	84	
Ethiopia/Ideol.	74	91	Uganda	66	66
Guatemala	66	72	Uganda	78	79
Guatemala	74	94	Uganda	80	86
Haiti	91	94	Vietnam.Rep.	60	75
Haiti	95	96	Yemen	94	94
India/Kashmir	65	65	Yemen, Arab.Rep.	62	69
India/Kashmir	89	94	Yemen, Peoples. Rep	86	87
India/Sirkh	84	94	Yugoslavia/Bosnia	92	95
Indonesia/East timor	75	82	Yugoslavia/Croatia	91	91
Indonesia	86	86	Yugoslavia/Croatia	95	95
Iran/Revolution	78	79	Zimbabwe/Rhodes	72	80
Iran	81	82	Zimbabwe	84	84
Iraq/Kurds	61	75			
Iraq/Kurds	88	94			
Iraq/Shiites	91	94			

TABLE 2
THE EFFECT OF DEMOCRACY ON THE PROBABILITY OF CIVIL WAR: PANEL DATA
ESTIMATION USING LOGIT

Dependent variable: The probability of civil war								
Model	1	2	3	4	5	6	7	8
Const	-3.21 (-1.08)	-3.25 (-1.00)	-2.09 (-0.62)	-3.38 (-1.05)	-4.09 (-1.33)	1.05 (0.19)	0.28 (0.05)	1.9 (0.30)
Educ	-0.33 (-2.29)	-0.29 (-1.96)	-0.30 (-2.03)	-0.30 (-1.87)	-0.30 (-2.09)	-0.15 (-0.92)	-0.11 (-0.69)	-0.12 (-0.74)
Lpopul	0.32 (2.24)	0.311 (1.95)	0.26 (0.15)	0.35 (2.1)	0.39 (2.46)	0.45 (2.88)	0.4 (2.56)	0.38 (2.41)
Lgdp	-0.13 (-0.39)	-0.106 (-0.3)	-0.19 (-0.54)	-0.155 (-0.42)	-0.08 (-0.25)	-0.48 (-1.06)	-0.65 (-1.32)	-0.74 (-1.47)
Ex	0.01 (0.16)	0.002 (0.04)	0.00 (0.01)	-0.00 (-0.04)	0.11 (0.17)			
ex2	-0.001 (-0.59)	-0.00 (-0.51)	-0.00 (-0.5)	-0.00 (-0.44)	-0.00 (-0.60)			
I						-0.06 (-1.59)	-0.05 (-1.06)	-0.04 (-1.05)
C						-0.03 (-0.86)	-0.01 (-0.18)	-0.01 (-0.24)
Frac						0.94 (0.61)	1.21 (0.76)	1.19 (0.75)
DemocP3		-0.04 (-0.68)					0.04 (0.72)	
AutocP3			-0.03 (-0.41)					-0.11 (-1.77)
PFc				0.61 (1.14)				
Freedom				-0.31 (-0.5)	-0.67 (-1.27)	-0.23 (-0.50)		
Safrica						-0.51 (-0.65)	-0.49 (-0.59)	-0.38 (-0.46)
Asiae						-0.06 (-0.08)	0.08 (0.11)	0.11 (0.15)
Laam						0.15 (0.26)	0.32 (0.55)	0.28 (0.49)
	428	403	403	378	428	564	534	564

Numbers in parentheses are t-statistics.

Educ: average years of schooling in the total population.

Lpop: : log of the population al the begining of the period.

Lgdp: Log of the real GDP per capita of the initial period (1985 international prices).

ex: share of primary exports in GDP.

ex2: square of ex.

I: Investment share of GDP.

C: Consumption share of GDP.

Frac: product of linguistic anf religious fragmentation.

DemocP3: Democracy level from Polity III data source.

AutocP3: Autocracy level from Polity III data source.

PFc: Dummy variable for Partially Free countries. FreedomHouse data source.

Freedom: Dummy variable for free countries. FreedomHouse data source.

Safrica: Dummy variable for Sun-Saharan countries.

Asiae: Dummy variable for Asian countries.

Laam: Dummy variable for Latin American countries

TABLE 3
THE EFFECT OF THE LEVEL OF INCLUSIVENESS ON THE PROBABILITY OF CIVIL WAR:
PANEL DATA ESTIMATION USING LOGIT

		Dependent variable: The probability of civil war							
Model	1	2	3	4	5	6	7	8	
Const	-1.83 (-0.53)	-1.5 (-0.43)	0.85 (0.193)	0.94 (0.22)	5.57 (0.89)	5.4 (0.88)	4.77 (0.73)	4.86 (0.76)	
Educ	-0.25 (-1.63)	-0.23 (-1.50)	-0.17 (-1.42)	-0.17 (-1.36)	-0.05 (-0.09)	-0.01 (-0.05)	-0.04 (-0.22)	-0.04 (-0.24)	
Lpopul	0.27 (1.76)	0.31 (1.94)	0.29 (2.82)	0.32 (2.98)	0.41 (3.04)	0.44 (3.24)	0.40 (2.57)	0.40 (2.54)	
Lgdp	-0.15 (-0.39)	-0.22 (-0.59)	-0.25 (-0.73)	-0.29 (-0.84)	-0.85 (-1.72)	-0.9 (-1.82)	-0.85 (-1.66)	-0.87 (-1.7)	
Ex	0.01 (0.11)	0.006 (0.09)							
ex2	-0.00 (-0.57)	-0.00 (-0.55)							
I			-0.04 (-1.30)	-0.04 (-1.21)	-0.07 (-1.56)	-0.06 (-1.47)	-0.06 (-1.43)	-0.06 (-1.37)	
C			-0.02 (-0.88)	-0.02 (-0.89)	-0.03 (-0.86)	-0.03 (-0.83)	-0.02 (-0.68)	-0.02 (-0.62)	
Frac					0.07 (0.07)	0.16 (0.16)	0.81 (0.52)	1.19 (0.75)	
AutocP3	-0.13 (-1.57)	-0.16 (-1.74)	-0.17 (-2.80)	-0.18 (-2.93)	-0.2 (-2.69)	-0.22 (-2.8)	-0.202 (-2.66)	-0.22 (-2.79)	
VAR	-0.78 (-1.96)		-0.65 (-2.36)		-0.66 (-2.01)		-0.70 (-2.06)		
VAR1		-1.39 (-2.14)		-1.12 (-2.52)		-1.15 (-2.17)		-1.21 (-2.22)	
Safrica							-0.30 (-0.38)	-0.59 (-0.72)	
Asiae							0.09 (0.13)	-0.04 (-0.06)	
Laam							0.43 (0.71)	0.23 (0.38)	
N	403	403	640	649	534	534	534	534	

Numbers in parentheses are t-statistics.

Educ: average years of schooling in the total population.

Lpop: : log of the population at the beginning of the period.

Lgdp: Log of the real GDP per capita of the initial period (1985 international prices).

ex: share of primary exports in GDP.

ex2: square of ex.

I: Investment share of GDP.

C: Consumption share of GDP.

Frac: product of linguistic and religious fragmentation.

AutocP3: Autocracy level from Polity III data source.

VAR: Level of inclusiveness.

VAR1: Level of inclusiveness.

Safrica: Dummy variable for Sun-Saharan countries.

Asiae: Dummy variable for Asian countries.

Laam: Dummy variable for Latin American countries

TABLE 4
 DEMOCRACY LEVEL, LEVEL OF INCLUSIVENES
 AND CIVIL WAR: PANEL DATA ESTIMATION
 USING LOGIT

Dependent variable: The probability of civil war				
Model	1	2	3	4
Const	1.6 (0.26)	1.26 (0.213)	6.13 (0.975)	5.6 (0.91)
Educ	-0.04 (-0.22)	-0.02 (-0.15)	-0.01 (-0.09)	-0.00 (-0.02)
Lpopul	0.44 (3.22)	0.46 (3.36)	0.39 (2.96)	0.44 (3.23)
Lgdp	-0.62 (-1.28)	-0.70 (-1.45)	-0.85 (-1.7)	-0.90 (-1.81)
I	-0.07 (-1.58)	-0.06 (-1.4)	-0.07 (-1.66)	-0.06 (-1.48)
C	-0.024 (-0.67)	-0.02 (-0.57)	-0.03 (-0.93)	-0.03 (-0.84)
Frac	-0.14 (-0.13)	-0.13 (-0.12)	0.04 (0.04)	0.12 (0.11)
DemocP3	0.17 (2.43)	0.18 (2.38)		
AutocP3			-0.25 (-3.28)	-0.27 (-3.38)
VAR	0.43 (1.09)		-0.99 (-2.62)	
VAR1		0.41 (0.61)		-1.66 (-2.80)
Demvar	-0.17 (-2.39)			
Demvar1		-0.22 (-2.05)		
Autvar			0.19 (2.49)	
Autvar1				0.28 (2.41)
N	534	534	534	534

Numbers in parentheses are t-statistics.

Educ: average years of schooling in the total population.

Lpop: : log of the population al the begining of the period.

Lgdp: Log of the real GDP per capita of the initial period (1985 international prices).

ex: share of primary exports in GDP.

ex2: square of ex.

I: Investment share of GDP.

C: Consumption share of GDP.

Frac: product of linguistic anf religious fragmentation.

DemocP3: Democracy level from Polity III data source.

AutocP3: Autocracy level from Polity III data source.

VAR: Level of inclusiveness.

VAR1: Level of inclusiveness.

Demvar: DemocP3*var.

Demvar1: DemocP3*var1.

Autvar: AutocP3*var.

Autvar1:AutocP3*var1.

TABLE 5
POLITICAL SYSTEMS AND CIVIL WAR:
PANEL DATA ESTIMATION USING LOGIT

Dependent variable: civil war		
Model	1	2
Const	4.86 (0.74)	4.27 (0.64)
Educ	-0.02 (-0.14)	-0.02 (-0.11)
Lpopul	0.37 (2.51)	0.36 (2.46)
Lgdp	-1.16 (-2.16)	-1.0 (-1.81)
I	-0.03 (-0.75)	-0.05 (-0.97)
C	-0.02 (-0.52)	-0.03 (-0.70)
Frac	-0.31 (-0.27)	-0.33 (-0.29)
DemocP3	0.08 (0.96)	0.35 (2.10)
PF	1.39 (2.56)	1.42 (2.37)
MAJO	0.36 (0.43)	0.68 (0.54)
PS	0.35 (0.44)	2.25 (2.09)
Dempf		-0.24 (-1.18)
Demmaj		-0.29 (-1.31)
Demps		-0.58 (-2.41)
N	417	417

We dropped the observations such that PR=1

Numbers in parentheses are t-statistics.

Educ: average years of schooling in the total population.

Lpop: : log of the population at the beginning of the period.

Lgdp: Log of the real GDP per capita of the initial period (1985 international prices).

ex: share of primary exports in GDP.

ex2: square of ex.

I: Investment share of GDP.

C: Consumption share of GDP.

Frac: product of linguistic and religious fragmentation.

DemocP3: Democracy level from Polity III data source.

PFc: Dummy variable for Partially Free countries. FreedomHouse data source.

MAJOc: Dummy variable for countries with Majoritarian systems.

PS: Dummy variable for countries with Presidential systems.

Dempf: DemocP3*PF.

Demmaj: DemocP3*MAJOc.

Demps: DemocP3*PS.

Omitted category: AUTO

TABLE 6
ANALYSIS OF ROBUSTNESS USING OTHER
EXPLANATORY VARIABLES: PANEL DATA
ESTIMATION USING LOGIT

Dependent variable: The probability of civil war				
Model	1	2	3	4*
Const	9.4 (1.27)	5.2 (0.65)	-1.41 (-0.16)	-0.83 (-0.08)
Educ	0.17 (0.82)	0.04 (0.19)	-0.19 (-0.73)	-0.25 (-0.85)
Lpopul	0.41 (2.55)	0.39 (2.27)	0.45 (2.01)	0.25 (1.00)
Lgdp	-1.12 (-1.82)	-0.61 (-0.88)	-0.15 (-0.19)	-0.40 (-0.47)
I	-0.11 (-1.96)	-0.11 (-1.82)	-0.08 (-1.37)	-0.05 (-0.70)
C	-0.05 (-1.26)	-0.03 (-0.75)	-0.01 (-0.28)	0.01 (0.12)
Frac	0.03 (0.02)	0.59 (0.43)	0.89 (0.53)	2.80 (1.41)
AutocP3	-0.34 (-3.48)	-0.32 (-3.05)	-0.29 (-2.43)	-0.24 (-1.65)
Var1	-1.61 (-2.356)	-1.63 (-2.29)	-1.66 (-2.15)	
PFc				1.93 (2.12)
MAJOc				-0.55 (-0.45)
PSc				0.22 (0.15)
Govercris	-0.21 (-1.01)	-0.22 (-1.16)	-0.22 (-1.16)	-0.26 (-1.31)
Antigov	-0.03 (-0.62)	-0.03 (-0.56)	-0.04 (-0.67)	-0.05 (-0.80)
Growth		-0.77 (-0.44)	-1.01 (-0.52)	-0.92 (-0.42)
Pish		-1.08 (-1.45)	-0.68 (-0.91)	-1.17 (-1.44)
Ppdev		0.14 (0.21)	1.4 (1.33)	1.25 (1.05)
Colony			0.20 (0.22)	-0.04 (-0.04)
Cristx			0.525 (0.57)	0.94 (0.88)
Musx			-1.01 (-0.76)	0.69 (0.48)
Budx			1.13 (0.97)	2.14 (1.53)
Hinx			-0.12 (-0.08)	1.42 (0.79)
N	421	416	368	281

*Column 4 we dropped the observations such that PR=1

Numbers in parentheses are t-statistics.

Govercris: Government crises

Antigov: Antigovernment demonstrations.

Growth: log difference GDP per capita, five years period from 1960 to 1989.

Pish: Price level of investment (PPP I / Xrate relative to U.S.) at the beginning of the period. (U.S.=1.0).

ppdev: Magnitude of the deviation of Pish560 from the sample mean.

Colony: Dummy variable for old colony countries.

Cristx, Musx, Budx, Hinx: dummy variable for cristians, muslims, budist and hinduist countries.