Government Corruption and Legislative Procedures: is One Chamber Better than Two?

by

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Abstract

This paper studies the impact of the competition between lobbies and voters on policy outcomes under alternative legislative procedures. Lobbies and citizens have opposing interests in a public policy and offer money and votes, respectively, to legislators to obtain their preferred policy. Comparing a unicameral and a bicameral legislative procedure, we show that bicameralism improves legislators' accountability when the same party controls the two chambers but not necessarily, if the two chambers are controlled by opposite parties. We also show that bicameralism with amendment rights (open rule) is better than bicameralism without amendment rights (closed rule). Finally, the evidence from a cross-country analysis, including 43 democracies, is consistent with our theoretical findings.

Keywords: Bicameralism, corruption, lobbying, voting, party polarization.
JEL classification: D72, H11, C78

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1 Introduction

In modern democracies members of legislative bodies are appointed through popular elections. Although, in principle, the legislature should only serve the interests of the electorate, organized interest groups often try to influence legislators offering money or information in exchange for policy favors. According to a benevolent view, interest groups convey information on individual preferences, thereby enhancing public decision making. It often happens, however, that lobbies and citizens have conflicting interests. In this cases, if it yields to lobby pressures, the legislature no longer serves the interests of its constituents, implying that the *accountability* of the legislature to the electorate is lost. Such considerations call us to question if voting is a good instrument to provide incentives to legislators and how it is possible to increase the electoral discipline.

According to several authors, institutional arrangements play a crucial role in shaping politicians' behavior and preventing legislators from abusing their power[1]. Recognizing the link between institutions and incentives, our work focuses on the role of legislative arrangements in the solution of the accountability problem.

The purpose of this paper is to assess whether a legislator is more accountable to voters when the parliament consists of one chamber (unicameral system) as opposed to two chambers (bicameral system). It has been argued[2] that bicameralism reduces the risk of abuse of power by a unique legislative body[3]. Hence, if we believe that

[1] For a general discussion on the role of institutions in preventing abuse of power see D.C. North and B.R. Weingast (1989), "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England", *The Journal of Economic History.*

[2] For a comprehensive descriptive analysis on governmental institutions in a comparative approach see, for example, D. G. Hirchner and C. Levine, *Comparative Goverment and Politics*, Harper and Row, Publishers, New York, 1981. For a more specific reading on bicameralism see G. Tsebelis and J. Money, *Bicameralism*, Cambdrige University Press, 1997.

[3] Bicameralism is generally adopted in federal states including the United States, Germany, Switzerland, where the interests of the states are represented in the second chamber. However, bicameralism may also be found unitary states such as Spain or Italy. In this case, the justification for a second chamber is not really the existence of a double base for representation but the risk of abuse of power by a unique legislative body.

bicameralism reduces the chance of abuse, we should conclude that bicameralism helps to solve the accountability problem. However, a number of countries are characterized by formal or *de facto* unicameralism[4] and there is no clear evidence that in those countries legislators are less accountable to voters. Scandinavian countries are the most striking example of unicameral systems with very low corruption level. In general, looking at cross-country evidence from a sample of democracies including OECD countries, Latin America, Asia and Africa it is very difficult to find a clear correlation pattern between corruption and bicameralism.

This paper presents a formal investigation of the effect of bicameralism on policy choice, which shows that the magnitude of the effect of bicameralism on accountability crucially depends on other political features such as the polarization of the political race and the bargaining power of the lobbies. In other words, bicameralism improves accountability only in a subset of cases. Our analysis therefore helps to reconcile the argument justifying bicameralism and the stylized facts.

Despite a rich literature studying separately electoral competition, lobbying and democratic institutions, these issues have rarely been analyzed jointly. To our knowledge, Groseclose and Snyder (1996), Helpman and Persson (1998) and Diermeier and Myerson (1999) are the only formal works that analyze *lobbying* and *legislation* jointly. Research dealing simultaneously with *voting*, *lobbying* and *legislation* is even more scant[5]. Our model provides a contribution in this direction.

The outline of the model is as follows. Citizens delegate to policy-makers the power to decide on a public project. Different types of projects can be realized and policy-makers choose their most preferred type of project. Citizens have preferences over the different types and therefore their private benefit from the public project depends on identity of the policy maker. Each type of project may be undertaken at either a high or low cost. The project is contracted to a private firm that obtains

[4]For example, Norway is a case of unicameral legislature. In other cases the power of the second chamber is limited in such a way that the legislature works as a unicameral system, as in Britain where the second chamber (House of Lords) has no power over money bills.

[5]Denzau and Minger (1986) study the relationship between voters, lobbies and legislators in a reduced-form model that does not provide micro-fundation for the agents behaviour.

positive profits if the high cost project is selected and zero profit if the low cost project is selected. Hence, firm and citizens have opposite interests on the cost of the project. They will try to influence the legislator in order to obtain their preferred cost. The instruments they can use to influence the legislators are different.

Citizens typically interact with the policy maker only when elections are called, as the policy maker needs the support of voters to be reelected. Therefore, if the incumbent legislator chooses a high cost project, citizens can punish the incumbent by electing a challenger. The firm can engage in a lobbying activity offering monetary transfers to the legislator. When the legislator and the lobby can bargain to share the surplus deriving from the policy, the project that maximizes their joint surplus is chosen.

The project that maximizes the surplus can be either the low cost or the high cost project. The high cost project generates a higher level of profits then the low cost project. However it also produces an electoral loss because, when the incumbent legislator chooses the high cost project, he will not be reelected and therefore he will no longer have the power to choose his most preferred type of project. Clearly, the bigger the distance between the preferences of the incumbent and the preferences of the challenger, the higher will be the electoral loss.

Since we assume that the incumbent cannot indefinitely run for office, in his last mandate he will not face elections and therefore he will choose the high cost project. On the other hand, when the legislator can run for elections, in order to choose the high cost project, he will claim a compensation for the electoral loss. Loosely speaking, the electoral loss can be interpreted as the cost of lobbying since, for the lobby group to obtain the high cost project, the electoral loss must be compensated. Since the lobby in the second period can bargain with the newly elected challenger, the surplus captured by the lobby in the second period can be used to compensate the electoral loss of the legislator in the first period. Hence, if the future surplus captured by the lobby is sufficient to compensate the current electoral loss, the high cost project can be chosen and the legislator is not accountable to voters.

Given that an accountability problem arises when lobby can offer transfers to

legislators, we ask whether the legislative procedures, affecting the cost of lobbying, can increase accountability. In particular, we compare a unicameral and a bicameral system to see which legislative procedure is better for accountability purposes. Intuitively, the bicameral system, increasing the number of legislator, should increase the electoral loss (cost of lobbying). We show that the effect of bicameralism on accountability depends on the decision power and on the policy preferences of the two chambers. In particular, a bicameral system where the two chambers have same proposal power and same preferences for policy types is better then a unicameral system. If the two chambers have different preferences for the type of policy, this result needs not to be true. We also compare different bicameral systems and we show that bicameralism with amendment right of the second chamber (*open rule*) is better than bicameralism with no amendment right of the second chamber (*closed rule*). Finally, we also discuss an example where bicameralism generates the same policy outcome than unicameralism. This happens if there is already a policy in place (*status quo* policy) preferred by the lobby against an alternative policy that is preferred by voters.

We conclude this paper with an empirical test of the model. We examine the evidence from 43 democracies and we find that polarization and bicameralism directly reduce corruption. We also find that the interaction between bicameralism and polarization and bicameralism and heterogeneity of legislators party membership play an important role. In particular, bicameralism increases corruption when legislators are likely to belong to different parties and the political race is polarized, while the opposite holds when the polarization is low. Therefore, we conclude that our model is consistent with the data.

The plan of the paper is as follows. In section 2 we outline the model and discuss the assumptions. In section 3 we characterize of the equilibrium under unicameralism and we discuss the results. Section 4 deals with bicameralism and accountability. In section 5 we analyze the effect of the polarization in the political race. In section 6 we present the empirical evidence. In Section 7 we summarize the results and conclude.

2 Economic environment

The economy is composed of N individuals. Let k denote the generic individual in the community N. We assume that there are three classes of individuals: citizens denoted $k = i$, lobbies denoted $k = l$ and legislators denoted $k = j$. The citizens i delegate to the government j the authority to decide on a public policy. The policy choice is as follows. First, the legislator has to decide whether or not to implement a policy. If he decides to implement the policy, he has also to decide on the type of policy he wants to implement and on its cost.

The *type* of the policy is a characteristic on which individuals have different tastes. Depending on the policy, the type can represents different aspects. For example, in the case of the production of a public infrastructure, the type could be the location; if we consider a reform, the type could be the reforming strategy (timing, sequencing etc.) and so on. We assume that policy makers are policy motivated on the type dimension. Let a_j denote the policy type delivered by the legislator j. Given the policy maker j and the generic individual k of the community N, we define a_{kj} the utility enjoyed by the individual k when the legislator j is choosing the policy and we assume that $a_{jj} = \max_k a_{kj.}$.

The *cost* of the policy is paid by the all the citizens of the community. We represent the per capita cost paid by citizens by $C \in \left\{C^L, C^H\right\}$, with $C^H > C^L$. Therefore, the *policy choice* can be represented as a vector (P, C, a_j), with $C \in \left\{C^L, C^H\right\}$ and $P \in \{0, 1\}$, where $P = 0$ means that no policy is selected and $P = 1$ means that a policy of type a_j and cost C is implemented.

Besides the utilities a_{kj}, the policy generates a profit $\Pi(P, C)$ increasing in both arguments which is assumed to go to the lobby l. We can think of various kinds of policies generating extra-benefits for a particular group of individuals. An interpretation of our assumption can be that the policy consists in the provision of a public good produced by private firms that receive an extra-benefit (profit) compared to other citizens. Other examples of public policies creating special private benefits for some groups are reforms, such as privatization and liberalization.

Finally, we assume that the lobby group l can offer money to the legislator in exchange for a policy favor. Let T_{lj} denote a monetary transfer from the lobby l to the legislator j. In formal terms, let $V_{kj}(.)$ be the payoff of the individual k when the policy maker j is in power, then the payoffs of citizen i, lobby l and policy maker j can be written as follows:

$$V_{ij}(P, a_j, C) = a_{ij}P - CP \tag{1}$$

$$V_{lj}(P, a_j, C, T_{lj}) = a_{lj}P + \Pi(P, C) - CP - T_{lj} \tag{2}$$

$$V_{jj}(P, a_j, C, T_{lj}) = a_{jj}P + T_{lj} - CP \tag{3}$$

To summarize, the policy maker j decides whether or not to implement a policy, $P \in \{0, 1\}$. If the he decides to implement the policy, $P = 1$, then he also decides on the cost of the policy, $C \in \left\{C^L, C^H\right\}$, and on the type of the policy, a_j. The generic individual k of the community N receives the utility a_{kj} from the policy and pays the cost $C \in \left\{C^L, C^H\right\}$ of the policy. When this generic individual is a lobby group, $k = l$, he also receives an extra-benefit from the policy, $\Pi(P, C)$ and may pay a transfer T_{lj} to the policy maker j. Finally we assume that the profit from the high cost policy is bigger than the sum of the percapita cost paid by the lobby and the legislator[6] and we denote $\pi(1, C)$ the difference between the profit and the sum of the those costs.

[6] This assumption captures the idea of conflict of interest on the cost dimension between voters on one side, and lobby and legislator on the other. The lobby and legislator can share a profit which offset the cost of the policy, while the citizens cannot do so. When there is a single legislator this means that $\pi\left(1, C^H\right) = \Pi\left(1, C^H\right) - 2C^H \geq 0$. If there are two legislators then $\pi\left(1, C^H\right) = \Pi\left(1, C^H\right) - 3C^H \geq 0$. Alternatively, we can obtain the same results assuming that the citizens only pay the cost so as to make the conflict of interests stronger and simply assume $\Pi(1, C) \geq 0$.

2.1 The game

The public policy is chosen by the policy maker j who interacts with the citizens i via the election and with the lobby l through the lobbying process. The lobbying process consists in a bargaining game between the lobby and the policy-maker to share the surplus deriving from the policy.

The timing of the game between policy maker, lobby and citizens is as follows. The game lasts for two periods[7] t, where $t \in \{1, 2\}$. At the beginning of the game an exogenously given legislator j is appointed to choose the policy (P, C, a_j). In every period t there is a new policy (P, C, a_j) to be selected. The policy generates a given payoff for each player. Since monetary transfers between the lobby and legislator are possible, then the lobby and the legislator can share their joint surplus from the policy. We define $S^t(P, C, a_j)$ the joint surplus of lobby and legislator in period t from the policy choice (P, C, a_j). As a consequence of the bargaining, the policy maximizing the joint surplus of lobby and legislator is chosen. In $t = 2$, citizens observe the policy choice (P, C, a_j) made by the incumbent[8] j in the previous period and an election takes place. The candidate receiving the majority of votes wins the electoral competition. After the election there is again a lobbying stage; then a policy (P, C, a_j) is selected and the game ends. *Figure 1* illustrates the sequence of events in each period.

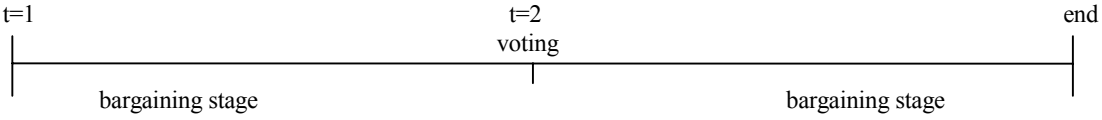

Figure 1 - timing

We model the sharing of surplus between lobby and legislator using a Nash bargaining approach. The bargaining is as follows. There is a set of policies (P, C, a_j) that can be chosen. If in $t = 1$, the lobby and the legislator find an agreement on a policy, they share the surplus from the policy. We define α_j and α_l the shares of

[7] In the rest of the paper we will interchange the terms period and mandate.

[8] They do not observe the transfer from the lobby to the legislator.

surplus received by the legislator j and by the lobby l if they reach an agreement. If no agreement is reached, they receive a given disagreement payoff. We denote $\bar{V}^t{}_j$ and $\bar{V}^t{}_l$ their disagreement payoffs in period t.

The electoral competition has the following characteristics. The identity of the candidates participating to the political race is determined by *ideological* political parties labelled party A and party B. The two parties select two candidates from a population distributed according to the preferences for policy types[9]. The two parties locate symmetrically around the median voter, which means that each party can only select a candidate on the left (right) of the median voter and each candidate then receives an equal number of votes. This assumption restricts the candidates to the subset $j \in \{A, B\}$ with *ideologies* (types), a_A and a_B, symmetrically located around the median voter[10]. Therefore finally only *two types* of candidates, a_A and a_B, run for elections.

At the beginning of the first period one of the two parties puts in place a policy maker $j \in \{A, B\}$. Let's assume that the policy maker in the first period is $j = A$. During the first mandate, the incumbent A choose the policy and one period later an election will take place, where the incumbent A will face a challenger B. Hence, in $t = 2$, the citizens observe the policy chosen by the incumbent A in the first

[9] Preferences on the ideological dimension are single picked, hence individuals can be ordered according to their preferences for policy types. We assume also that the distribution is symmetric with respect to the median voter. Later on in the paper we give some examples of symmetric distributions and we discuss the implication of different distributions.

[10] Technically we assume that: $\mid a_{mA} - a_{mm} \mid = \mid a_{mB} - a_{mm} \mid$.

Since two candidates compete for the election, to avoid the trivial case where one candidate has an absolute advantage in the political race, both candidate must have a chance of winning the election. Given that in our model the ideological dimension is fixed and determined by the party position, for both candidates to have a chance of winning it must be that, when both candidates choose the same cost $C \in \left(C^L, C^H\right)$, there is no a_A and a_B such that one candidate wins the election. In other words, if the candidates choose the same cost, then no party can win the election on ideological grounds. Therefore, loosely speaking, since the ideology component is not sufficient to break the indifference of the majority, the political issue that can make a difference in the electoral outcome is the cost of the policy. This is equivalent to say the cost of the policy is the "*politically salient*" issue as in Besley-Coate (2000).

period and decide whether to reappoint A or to replace him with the challenger B. The voting strategy for the citizen i facing an incumbent A and a challenger $B \neq A$ consists in a mapping $\sigma_{iA} : (P, C, a_A) \rightarrow \{0, 1\}$, where 1 means reelection of the policy maker A by the citizen i and 0 means that the citizen i replaces the incumbent A with the challenger B. Voters do not observe the transfers between lobby and legislator but they know that lobbying occurs. In equilibrium citizens, anticipating that the lobby and the legislator share their surplus, choose the voting strategy that gives them the highest utility[11].

3 Sharing rules and policy choice

The lobby group and the legislator can share their joint surplus from the policy choice using monetary transfers. If no transfers (no lobbying) were allowed, the legislator would choose the policy maximizing his individual payoff. But when the lobby and legislator can bargain over the surplus, then the policy maximizing their joint surplus will be chosen. Our objective is to understand how the sharing of surplus affects the policy choice. In particular, we would like to know if the policy selected by the bargaining is different from the policy that a legislator would choose in absence of lobbying. Hence, let's start analyzing the policy choice in absence of lobbying.

If there are no monetary transfers, the payoff of the legislator depends only on the type of project selected and on the taxes paid to finance the project. During his first mandate a legislator choose his most preferred policy type and decides on the cost of the policy. At the end of the mandate, his choice is observed by voters that decide whether to reappoint the legislator for the second mandate or to replace him with the challenger. Given the voting decision of the citizens, the legislator can compute the expected payoff from each policy choice and choose the policy that gives him the highest payoff. To compute the equilibrium policy, we need to introduce the

[11] Formally, The equilibrium of the voting game is a vector $\Sigma_j^* (P, C, a_j)$ of individual voting decision $\sigma_{ij}^* (P, C, a_j)$ such that, given the sharing rules α_j and α_l:

$V_{ij} \left(P, C, a_j, \Sigma_j^* (.)\right) \geq V_{ij} \left(P, C, a_{j^t}, \Sigma_{j^t} (.)\right) \qquad \forall \Sigma_j (P, C, a_j) \neq \Sigma_j^* (P, C, a_j)$

voting decision associated to each policy. We make the conjecture that the legislator is reelected if he choose the low cost project or if he doesn't choose any project and is not reelected if he chooses the high cost project[12].

Let A be the incumbent legislator and B the challenger. Then given the policy types and the equilibrium voting strategy, the policy choice with no lobbying is the following[13]:

Proposition 1 *If no transfers between lobby and legislator are allowed, then the legislator chooses the policy* $\left(1, a_j, C^L\right)$ *in both mandates.*

Therefore, from *proposition 1* we learn that, when no transfers are allowed, the legislator chooses the most preferred voters' policy. This is not surprising as in this case the legislator is subject only to electoral incentives.

We analyze now the policy choice when the lobby and the legislator can share their joint surplus. We know that the legislator can choose a low cost project or an high cost project and we would like to see how the policy choice depends on sharing rules.

Given the surplus, $S^t\left(P, a_j, C\right)$, the disagreement payoffs $\bar{V}^t{}_j$ and $\bar{V}^t{}_l$, and the shares of surplus α_j and α_l,the payoff of each player participating to the sharing of surplus can be written as follows:

[12] In formal terms, using the definition of voting strategy:

$$\Sigma_j\left(P, a_j, C\right) = \left[\sigma_{ij}\left(1, a_j, C^H\right) = 0, \sigma_{ij}\left(0, 0, 0\right) = 1, \sigma_{ij}\left(1, a_j, C^L\right) = 1\right]$$

we will prove in appendix that this is indeed an equilibrium voting strategy. The intution for this result is the following. In the last period the incumbent is always choosing the policy $\left(1, C^H\right)$ because the game ends and he cannot be punished or rewarded by the voters. Hence, the best the voters can do is to use a voting strategy that allows them to obtain their most preferred policy at least in the first period. This strategy is the one that punishes the incumbent if he is chosing the worse policy for voters, $\left(1, C^H\right)$ and rewards the incumbent if he doesn't. Any other strategy will give the voters lower utility.

[13] Proofs of all the propositions and lemmata are provided in appendix.

$$V_j^t\left(P, a_j, C, \alpha_j, \alpha_l\right) = \bar{V}^t{}_j + \alpha_j \left[S^t\left(P, a_j, C\right) - \bar{V}^t{}_j - \bar{V}^t{}_l\right]$$

$$V_l^t\left(P, a_j, C, \alpha_j, \alpha_l\right) = \bar{V}^t{}_l + \alpha_l \left[S^t\left(P, a_j, C\right) - \bar{V}^t{}_j - \bar{V}^t{}_l\right]$$

Where clearly the sum of $V_j^t\left(P, a_j, C, \alpha_j, \alpha_l\right)$ and $V_l^t\left(P, a_j, C, \alpha_j, \alpha_l\right)$ gives the joint surplus, $S^t\left(P, a_j, C\right)$.

Note that, for the bargaining to occur it must be that there is at least an agreement preferred to the disagreement event by both players, i.e. there must be at least an agreement for which the surplus from the agreement is bigger then the sum of the disagreement payoffs. Once we have verified that there are agreements for which this condition is satisfied, in order to determine the equilibrium policy we have just to look for the policy that maximizes the surplus.

We will solve the game by backward induction. The solution depends on the disagreement payoff. Therefore, we need to specify what happens to the policy choice in case of disagreement. In our model we can figure out different disagreement scenarios. For example, if the project can only be authorized by the legislator and can only be executed by a firm, then in case of disagreement, no project can be chosen. Hence, the disagreement outcome is the policy choice $(0, 0, 0)$ and the disagreement payoffs of the two players will be identical. On the other hand, if one of the two players can realize the project independently of the other player, then the disagreement payoffs of the two players could be asymmetric. For example, suppose that the government is the only agent that can authorize the project and there are several firms that can realize the project. In this case, if the bargaining between the legislator and one firms breaks down, the legislator can always find a way to realize the low cost project. Therefore, the disagreement payoffs for the firm will be the utility she obtains when no policy is chosen, while the legislator will obtain the utility of the low cost project. In general, we can think about several possible disagreement payoffs, and for each disagreement payoff we can solve the bargaining.

We can easily verify that, in the second period, given any pair of disagreement

payoffs[14], $\left(\bar{V}^2{}_j; \bar{V}^2{}_l\right)$ the following holds:

Lemma 1. *Given the policy choices* $\left(1, a_j, C^H\right)$, $\left(1, a_j, C^L\right)$, $(0,0,0)$, *the following holds:*

$$S^2\left(1, a_j, C^H\right) - \bar{V}^2{}_j - \bar{V}^2{}_l > 0$$

$$S^2\left(1, a_j, C^L\right) - \bar{V}^2{}_j - \bar{V}^2{}_l \geq 0$$

$$S^2\left(0,0,0\right) - \bar{V}^2{}_j - \bar{V}^2{}_l < 0$$

From *lemma 1* we see that, there are two policies, $\left(1, a_j, C^H\right)$ and $\left(1, a_j, C^L\right)$, for which the payoff each player obtains from an agreement is not inferior to their disagreement payoff. It is trivial to verify that, for any possible sharing rule dividing the surplus between the lobby and the legislator, the high cost project is the surplus maximizing policy. Hence, formally we can state the following result:

Proposition 2 *During the second mandate, given any share* α_l *, the policy* $\left(1, a_j, C^H\right)$ *is chosen.*

We can now move to the first period to characterize the equilibrium policy outcome. The main difference between the first and the second mandate is that in the first mandate the legislator faces elections. We know that the electoral outcome will have an effect on the payoff of lobby and legislator because the identity of the future policy maker determines the selection of the future policy types a_j. Furthermore, if the legislator is not reelected, in the second period he will not participate to the sharing of surplus with the lobby. Therefore, the legislator and the lobby, bargaining

[14] Given our economic environment, in the second period, depending on whether or not the two players can realize the project independently, there are four possible pairs of disagreement payoffs: $\left(\bar{V}^2{}_j = 0; \bar{V}^2{}_l = 0\right)$, $\left(\bar{V}^2{}_j = a_{jj}; \bar{V}^2{}_l = a_{lj}\right)$, $\left(\bar{V}^2{}_j = a_{jj}; \bar{V}^2{}_l = 0\right)$, $\left(\bar{V}^2{}_j = 0; \bar{V}^2{}_l = a_{lj}\right)$
In the first pair, none of the players can realize the project on his own. In the second pair both players can realize the project independently. In the third and forth pairs only one player can realize the project independently of the other player.

over the surplus deriving from a the current policy choice, will take into account the effect of the policy choice on the electoral outcome.

Given the incumbent A, and the challenger B, the payoffs of the incumbent and the lobby during the first period are as follows:

$$V_A^1\left(P, a_j, C, \alpha_j, \alpha_l\right) = \bar{V}^1{}_A + \alpha_j \left[S^1\left(P, a_j, C\right) - \bar{V}^1{}_A - \bar{V}^1{}_l\right]$$

$$V_l^1\left(P, a_j, C, \alpha_j, \alpha_l\right) = \bar{V}^1{}_l + \alpha_l \left[S^1\left(P, a_j, C\right) - \bar{V}^1{}_A - \bar{V}^t{}_l\right]$$

Again we have to verify that there is at least an agreement for which the players obtain a payoff which is bigger then their disagreement payoff. Hence, for a generic pair of disagreements payoffs[15] $\left(\bar{V}^1{}_j, \bar{V}^1{}_l\right)$ we can verify the following:

Lemma 2 *Given the policy choices* $\left(1, a_j, C^H\right)$, $\left(1, a_j, C^L\right)$, $(0,0,0)$ *and given the disagreement payoffs* $\left(\bar{V}^1{}_j, \bar{V}^1{}_l\right)$, *in the first period the following holds:*

$S^1\left(1, a_j, C^H\right) - \bar{V}^1{}_j - \bar{V}^1{}_l \lesseqgtr 0$

$S^1\left(1, a_j, C^L\right) - \bar{V}^1{}_j - \bar{V}^1{}_l = 0$

$S^1\left(0,0,0\right) - \bar{V}^1{}_j - \bar{V}^1{}_l < 0$

From *lemma 2* we can see that, in first mandate the high cost project is not always a profitable bargaining outcome. Therefore, to see if the high cost project can be chosen, for every possible pair of disagreement payoff, $\left(\bar{V}_j^1, \bar{V}_l^1\right)$, we have to verify under which conditions the agreement on the high cost project is preferred to the disagreement event and to the agreement on the low cost project. In formal terms, we can prove the following result:

[15] The four possible pairs of disagreement payoffs in the first period are the following:
$\left(\bar{V}_j^1 = \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}_l^t = \alpha_l S^2\left(1, C^H, a_l\right)\right)$, $\left(\bar{V}_j^1 = a_{AA} + \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}_l^t = a_{lA} + \alpha_l S^2\left(1, C^H, a_l\right)\right)$, $\left(\bar{V}_j^1 = a_{AA} + \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}_l^t = \alpha_l S^2\left(1, C^H, a_l\right)\right)$,-$\left(\bar{V}_j^1 = \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}_l^t = a_{lA} + \alpha_l S^2\left(1, C^H, a_l\right)\right)$

Lemma 3 *If* $\alpha_l \geq \frac{(a_{AA}-a_{AB})+C^H+a_{lA}-\bar{V}_l^2}{S^2(1,a_j,C^H)-\bar{V}_l^2-\bar{V}_B^2}$*, then the high cost project is chosen. Otherwise the low cost project is chosen.*

Therefore, from *lemma 1* and *lemma 2* we conclude that, in the second mandate the high cost project is always chosen, while in the first mandate the high cost project is chosen if and only if the share of surplus received by the lobby is sufficiently high, i.e. $\alpha_l \geq \frac{(a_{AA}-a_{AB})+C^H+a_{lA}-\bar{V}_l^2}{S^2(1,a_j,C^H)-\bar{V}_l^2-\bar{V}_B^2}$. Clearly, the difference between the first and the second mandate is related to the electoral discipline. Indeed, if we write the surplus associated to the high cost and low cost project we can see the effect of the elections on the surplus:

$$S^1\left(1,a_j,C^L\right)=a_{AA}+a_{lA}+a_{AA}+a_{lA}+\pi\left(1,C^H\right)$$

$$S^1\left(1,a_j,C^H\right)=a_{AA}+a_{lA}+\pi\left(1,C^H\right)+a_{AB}-C^H+\bar{V}_l^2+\alpha_l\left[S^2\left(1,a_j,C^H\right)-\bar{V}_l^2-\bar{V}_B^2\right]$$

If the low cost project is selected, then in the first period the lobby and the legislator just obtain the benefit from the policy type $(a_{AA}+a_{lA})$, while on the second period they obtain the benefit from the policy type and the profit[16], $\left(a_{AA}+a_{lA}+\pi\left(1,C^H\right)\right)$.

If the high cost project is selected, then in the first period the lobby and the legislator obtain the same surplus that they obtain in the second period when they choose the low cost project, $\left(a_{AA}+a_{lA}+\pi\left(1,C^H\right)\right)$. On the other hand, given the electoral outcome[17], in the second mandate the incumbent legislator obtains the benefit from the policy type chosen by the challenger minus the taxes paid to finance the policy, $a_{AB}-C^H$. While, the lobby group, sharing the surplus with the challenger, obtains the payoff $\bar{V}_l^2+\alpha_l\left[S^2\left(1,a_j,C^H\right)-\bar{V}_l^2-\bar{V}_B^2\right]$. Therefore, if we compare the high cost and the low cost project, it is clear that the high cost project generates higher profits. However, the higher profits are not sufficient to insure that the surplus of the high cost project is bigger then the surplus of the low cost project because the

[16] Remember that $\pi(1,C)$ is the profit net of taxes paid by lobby and legislator.

[17] The challenger replaces the incumbent.

high cost project implies a change of policy type (electoral loss) that might reduce the total surplus.

From *lemma 3*, it is also clear that, the outcome of the bargaining depends on the disagreement payoffs. So far we have considered all the possible disagreement payoffs that we think could arise in our set up. Now, we make a precise assumption on the disagreement payoff and we carry on our analysis under this assumption[18]:

Assumption 1 *In the first and second mandate the disagreement payoffs are the following:*

$$\left(\bar{V}_j^1 = a_{jj} + \alpha_j S^2\left(1, C^H, a_j\right);\ \bar{V}_l^1 = \alpha_l S^2\left(1, C^H, a_l\right)\right)$$

$$\left(\bar{V^2}_j = a_{jj};\ \ \bar{V^2}_l = 0\right)$$

Therefore, we assume that the government has an higher disagreement payoff compared to the lobby. Our interpretation of these disagreement payoffs is that the government is the only agent that can decide to realize a public project, but there are several firms that could realize the project. Therefore, if the government and a firm do not reach an agreement to realize the project at high cost, then government can always realize the project at low cost. To keep the notation simpler, with no loss of generality we also assume from now on that $\pi(1, C^H) = \pi \geq 0$ and $\pi(1, C^L) = 0$

The following proposition characterizes the policy choice in the first mandate under assumption 1:

Proposition 3 *In the first mandate, if the share of surplus received by the lobby is such that* $\alpha_l \geq \frac{(a_{AA} - a_{AB}) + C^H + a_{lA}}{a_{lB} + \pi}$*, then the high cost project is selected; otherwise, the low cost project is selected.*

[18] The main results of the model holds also under the alternative disagreement payoffs. We prefer to illustrate the equilibrium arising in this particular case because we think it captures the outside options of the two players in a more realistic way.

Now that we have fully characterized the policy choice, we can evaluate the effect of lobbying on policy outcomes. To simplify the notation, let's define $\underline{\alpha} = \frac{(a_{AA}-a_{AB})+C^H+a_{lA}}{a_{lB}+\pi}$ the critical level of the lobby share in *proposition 3*. Remember that, in absence of lobbying, from *proposition 1* we know that the legislator always chooses the low cost project . When transfers between lobby and legislator are allowed, from *proposition 3* we can see that there exist a sharing rule such that the high cost project is selected, $\alpha_l \geq \underline{\alpha}$. Therefore, we conclude that if the share of surplus received by the lobby is sufficiently high, then the policy choice under lobbying is different from the policy choice under no lobbying. On the other and, if the share of surplus received by the lobby is not big enough, i.e. $\alpha_l < \underline{\alpha}$, then lobbying doesn't affect policies. In the next section we discuss the main properties of the political equilibrium.

3.1 Electoral versus monetary incentives

The main objective of this exercise was to understand how the incentives provided by voters and lobbies to legislators affect policy outcomes. Using the characterization of the political equilibrium we can now evaluate the effect of the incentives on policy outcomes. Voters and lobbies use different instruments to influence the policy-maker. Lobbies offer monetary transfers and citizens offer votes. Since voters and lobby have opposite interests, legislators face the trade-off between current transfers from lobbying and future gain from reelection. The main insight from our analysis is that when transfers between lobby and legislators are not allowed, then the legislator faces only electoral incentives and indeed the most preferred voters' policy is implemented. Hence, if we could forbid monetary transfers, the accountability problem will be solved[19]. On the other hand, when transfers between lobby and legislator cannot be forbidden, then both monetary and electoral incentives are provided. In this case, if

[19] This argument provides a rationale for the fact that in many countries lobby contributions are illegal. However, this restriction on lobby contributions is difficult to enforce as it is shown by the evidence that in countries where lobby contributions are illegal transfers between lobby and legislators still occur.

the surplus captured by the lobby, $\alpha_j S^2\left(1, C^H, a_B\right)$ is big enough to compensate for the electoral loss, then electoral discipline doesn't work.

To summarize, when no lobbying occurs, then the legislator chooses the low cost project. When the lobby and the legislator can share the surplus generated by the policy using monetary transfers, then the high cost project can be chosen. The main difference between a low cost and an high cost project is that the low cost project implies lower profit but insures reelection of the incumbent legislator. Since incumbency generates the benefit from the selection of the policy type and the incumbent can always choose the low cost project and be reelected, then for the high cost project to be selected, the extra-profit it generates has to be big enough to compensate the electoral loss of the incumbent. In our model the electoral loss of the legislator is represented by the expression $(a_{AA} - a_{AB}) + C^H$. When the legislator is replaced by the challenger, he cannot choose anymore his most preferred policy type and he suffers a loss $(a_{AA} - a_{AB})$, moreover becoming an ordinary citizens he has to pay taxes C^H. The lobby also faces an effect from the incumbency change in the she will not enjoy the benefit from the policy chosen by the incumbent[20], a_{lA}. Furthermore, as the lobby also has preferences for policy types, then for the high cost project to be selected, the extra-profit has to compensate for the loss of the lobby.

Loosely speaking, the electoral loss can be interpreted as the *cost* of lobbying and the surplus captured by the lobby group can be interpreted as the *revenue* of lobbying. When the *revenue* from lobbying is higher then the *cost* of lobbying, then the cost of lobbying is affordable and therefore the lobby group obtains her most preferred policy.

It is clear that, the electoral loss (cost of lobbying) crucially depends on how far the incumbent is from the challenger on the ideological dimension. On the other hand, the revenue generated by lobbying depends on the share of surplus received by the lobby. The shares obtained by the two players are a reduced form representation of their the bargaining power[21]. Therefore, the two key factors determining the

[20] However she enjoys the benefit $\alpha_l a_{lB}$.

[21] In our model the shares are exogeneously given as we do not investigate the reasons behind

strength of the electoral and the monetary incentives are the polarization of the political race and the bargaining power of the lobby group. Given the polarization of the political race[22], if the lobbying activity generates a sufficiently high surplus for the lobby, then monetary transfers can be used to compensate for the electoral loss and therefore monetary incentives are more effective then electoral incentives. In this case, the legislators chooses the policy preferred by the lobby and is not accountable to voters. Hence the question arises. How can we increase the power of the electorate to discipline the legislator? According to our model, in order to improve accountability it is necessary to increase the cost of lobbying (electoral loss) or to decrease the revenue from lobbying (lobby share). Two immediate instruments to increase the cost and decrease the revenue of lobbying are the polarization of the political race and the bargaining power of the legislator. However, if we take polarization and bargaining power as given, another way to increase the cost of lobbying could be just to increase the number of legislative bodies. Loosely speaking, if the lobby has to compensate the electoral loss of two legislative bodies instead of one, then the cost of lobbying should be higher and less likely to be affordable. This very simple idea is one of the explanations for multiple legislative bodies we observe in real word. In the next section we will see if our model provides an explanation for this intuition.

the bargaining power of the two players. However, this bargaining power could be related to some institutional features. In particular, the degree of control the legislator has on the legislative process could affect the bargaining power of the legislator in a crucial way. For example, when the duration of a political mandate is uncertain because of endemic government instability, the legislator bargaining position in spite of the lobby group could be weak. Similarly, coalitional governments that need to engage in long and costly bargaining within the coalition in order to formulate a policy proposal may not have strong bargaining position. Hence, we think that the analysis of the relationship between bargaining power and characteristics of the decision-making process should be a matter of future investigations.

[22] We will discuss later the polarization result.

4 Bicameralism

In a bicameral system the parliament consists of two elected houses of representatives. In our model two elected bodies should "double" the electoral incentives. However, the mere existence of two legislative bodies does not necessarily imply that the cost of lobbying becomes double, since the decision power of the two bodies is important in the negotiation between lobby and legislators. For example, if the second chamber doesn't have *veto* power, the bicameral system would work *de facto* as a unicameral system[23] and the cost of lobbying should not increase. Hence, if we want to analyze the effect of multiple legislative bodies on policy outcomes we have to be more precise about the legislative power of each body.

For our purposes, we consider a bicameral system where the approval of both legislative bodies is necessary to pass a policy proposal. Therefore, the second chamber has the *veto* power.

Another important procedural detail to take into account when there are multiple decision makers is the procedure followed when the two chambers disagree on a policy proposal. For example, in most bicameral systems, the second chamber has amendment rights and in case of disagreement the two chambers engage in a debate before arriving to a final decision. This legislative procedure is the so called *open rule*. On the other hand, there are cases where amendment rights are restricted[24]and there are legislative procedures where the second legislator can only use *veto* power[25]. The legislative procedure that allows *veto* power and excludes amendment right is known as closed rule.

Finally, another aspect that we should take into account when there are multiple decision makers is the party membership of the different legislators. If the two legisla-

[23] This happen for example, in France where, when the two chambers do not agree, the Assembly has the power of decision.

[24] For example in France deputy amendments cannot have the effect of increasing spending and decreasing revenue.

[25] An example of this can be found in the "package vote" allowed by the french constitution. The goverment can group articles and amendment selectively, excluding amendments that are opposed, and require the assembly just a *yes* or *no* decision.

tive bodies share the same policy preferences, then they will have the same electoral loss. However, if the two bodies disagree on the ideological dimension, then their electoral loss will be different and the electoral incentives could be less effective[26]. This aspect of a bicameral system may also be typical of coalitional governments, where political actors with different policy preferences need to find an agreement over a policy. However, while coalitional government by definition are only formed by different parties, heterogeneity of party membership is not a general characteristic of bicameral systems. Most importantly, multiple decision makers in coalitional government only arise as a particular outcome of the electoral process, while under bicameralism multiple decision makers will always be present, although their party membership can be more or less heterogeneous depending on the electoral outcomes.

In some respects bicameralism is similar to other institutional arrangements featuring multiple decision-makers. Examples of multiple policy-makers may be found for example in federal states or under separation of power where the executive and the legislative power are allocated to different elected bodies. Hence, we need here to clarify how bicameralism differs from other forms of multiple decision-making.

The main characteristic of a bicameral system is the existence of two bodies with legislative power. Therefore the essence of bicameralism is very different from separation of powers. In the first the same power is shared between two elected bodies, while in the second two different powers are attributed to different bodies, with the objective to provide check and balances in the decision-making process. In terms of implications for the decision-making process, the difference between bicameralism and separation of powers is very clear in the so called perfect bicameralism, where the two chambers have amendment rights. In a perfect bicameral system each branch of the parliament can amend a piece of legislation passed by the other, while under separation of powers it is never the case that the executive can amend a piece of legislation passed by a legislative body[27].

[26] In most bicameral systems the two chambers have the same type of majority. However, this type of heterogeneity is possible and it is not an uncommon feature, as it is shown by the american congress, where the house and the senate are often under the control of different majority parties.

[27] When the second chamber does not have amendment rights, the difference between bicameralism

While the principle of separation of powers lies at the hearth of modern parliamentary democracies, bicameralism is typical only of some parliamentary democracies. In some democratic systems the existence of the second chamber is associated with the federal structure of the state, as typically the second chamber is meant to represent the interests of the federal states. However, although bicameralism is often associated with federalism, the two concept remain distinct. Federalism implies delegation of power from the central to local governments on matters concerning local jurisdictions. Hence, the process of delegation rather than sharing of power between bodies, and the local rather than national nature of the power, makes federalism a very different concept as compared to bicameralism. Indeed federalism may be realized without bicameralism and viceversa[28].

In what follows we formally analyze the different aspects of a bicameral systems. First we consider a legislative procedure with two legislators having same policy preferences and same proposal power (*open rule*). Then we will see what happens if the two legislative bodies have different proposal power (closed rule). Finally, we will introduce heterogeneity of policy preferences to see how divergent tastes for policy types may affect the policy choice.

4.1 Open rule

We start our analysis with a bicameral system where the second legislator has *veto* power and amendment right. In the political science jargon this is the so called *open rule*. This type of legislative procedure implies that the two legislators have equal proposal power[29].

and separation of powers becomes less sharp. A presidential system with presidential *veto power* and a bicameral system under *closed rule* would constitute an extreme example where bicameralism and separation of power are almost indistinguishable, apart for the size of the institutional bodies.

[28] Canada constitute an example of federal state with de facto unicameralism, Italy is an example of bicameral and non-federal state.

[29] In the real world this allocation of proposal rights is widely used as, in general, the second chamber is entitled with amendment right but the text of a bill needs to be approved in the same form by both legislative bodies. More precisely, this is always true in the so called *perfect bicameralism*, where a bill has to be passed in the same form by both chambers. This is for example the case of

In formal terms, the bicameral system works in the following way. The legislative process involves two legislators, denoted j_1 and j_2. We assume that the two legislators have most preferred policy types a_{j_1} and a_{j_2} and, for simplicity, we do assume that $a_{j_1} = a_{j_2}$. Therefore, given that $j_1 \in \{A, B\}$ and $j_2 \in \{A, B\}$, we are assuming that the two legislators are both either of type A or of type B[30].

The two decision-makers decide sequentially on the policy. Therefore, the legislative process consists of two stages. In the first stage, the legislator j_1 chooses a policy. In the second stage, the legislator j_2 either ratifies the choice of the first legislator or proposes a different policy. For a policy to be selected, both legislators must agree on the policy. It is trivial to verify that in absence of lobbying the two chambers choose the policy preferred by voters. On the other hand, when there is lobbying, a bargaining process between the two legislators and the lobby will take place. Therefore, the main difference between the unicameral and the bicameral system is that in the latter three players have to agree on the policy to be chosen. Hence, for example, if there is disagreement between the two chambers, the negotiation breaks down. The outcome of this game depends on the disagreement payoffs of the three players and we continue to assume that, in case of disagreement, two legislators can realize the low cost project on their own, while the lobby group cannot realize any project.

In the second political mandate, the existence of the second legislator does not change the policy outcome and *proposition 2* still holds, i.e. in the second period the high cost project is chosen. Therefore, we only need to analyze the policy choice in the first mandate.

In the first mandate, the disagreement payoffs of the three players are the following:

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the US Congress and the italian parliament.

[30] This assumption simplifies the electoral process. Otherwise we would need to model the parties selection of heterogeneous candidates in a more complex way. We think that this can be an interesting extension of the model, in particular if we want to focus more on the link between electoral systems and policy choice.

$$\left(\bar{V^1}_{A_2} = a_{AA} + \alpha_{A_2} S^2\left(1, C^H\right);\ \bar{V}^1{}_{A_1} = a_{AA} + \alpha_{A_1} S^2\left(1, C^H\right);\ \bar{V^1}_l = \alpha_l S^2\left(1, C^H\right)\right)$$

It is trivial to verify that *lemma 2* holds also in the game with three players. Therefore, according to the rationale we used to solve the bargaining in the unicameral system, we can state the following for the bicameral system:

Lemma 4 *If* $\alpha_l \geq \frac{2\left[(a_{AA}-a_{AB})+C^H\right]+a_{lA}}{a_{lB}+\pi}$, *then the high cost project is chosen. Otherwise, the low cost project is chosen.*

Again, to simply the notation, let us define $\overline{\alpha} = \frac{2\left[(a_{AA}-a_{AB})+C^H\right]+a_{lA}}{a_{lB}+\pi}$ the critical value of the lobby share in the bargaining with three players[31]. Using *lemma 4* and the characterization of the equilibrium in the unicameral system, we can now compare unicameralism and bicameralism to see how the two different legislative procedures affect policy outcomes.

The following proposition summarizes the main results of our model:

Proposition 4 *Given the share of surplus received by the lobby,* α_l, *the following result hold:*

if the share received by the lobby is such that $\alpha_l < \underline{\alpha}$ *, then in both the unicameral and the bicameral system the low cost policy is chosen* ;

if the share received by the lobby is such that $\alpha_l \geq \overline{\alpha}$ *, then in both the unicameral and the bicameral system the high cost policy is chosen*;

if the share received by the lobby is such that $\underline{\alpha} \leq \alpha_l < \overline{\alpha}$ *, then in the bicameral system the low cost policy is chosen, while the unicameral system the high cost policy is chosen.*

Our analysis confirms our initial intuition that the cost of lobbying under bicameralism is higher then the cost of lobbying under unicameralism since the electoral

[31] Remember that we have previously defined the critical value of α_l in the unicameral system as $\underline{\alpha} = \frac{\left[(a_{AA}-a_{AB})+C^H\right]+a_{lA}}{a_{lB}+\pi}$

loss of two legislators has to be compensated. This is formally shown by the simple observation that the critical value of the lobby share under unicameralism lies below the critical value under bicameralism, i.e. $\underline{\alpha} < \overline{\alpha}$. This implies that when one legislator is not accountable to voters, i.e. $\alpha_l \geq \underline{\alpha}$, two legislators can be accountable, i.e. $\alpha_l < \overline{\alpha}$. However the fact that $\underline{\alpha} < \overline{\alpha}$ does not guarantee that the share received by the lobby, α_l, is inferior to the threshold $\overline{\alpha}$. Hence, when the share received by the lobby is higher then the threshold level $\overline{\alpha}$, the high cost project is chosen also in the bicameral system.

It is important to observe that the equilibrium policy outcome only depends on the share received by the lobby or, equivalently, on the total share received by the two legislators. Therefore, we can always find a total share such that the unicameral and the bicameral system generates exactly the same policy outcome. In other words, given the total share of surplus received by the government, two legislative bodies choose the same policy that one legislative body would choose for the same share of surplus[32]. This means that two legislators act exactly as one legislator and therefore the division of the decision making process *per se* does not change the policy outcome. Hence, the existence of multiple decision makers affects the policy outcome only because the conditions to reach an agreement change with the number of players. Typically, as the number of players increases, it becomes more difficult to reach an agreement.

Finally, note also that when the cost of lobbying of a unicameral system is not affordable, i.e. $\alpha_l < \underline{\alpha}$, then one legislator is sufficient to guarantee accountability and, at least for accountability purposes, there is no need to introduce a second legislative body[33]

From *proposition 4*, we conclude that the existence of a second legislator with same proposal power and same preferences of the first legislator makes more likely

[32] In formal terms, for any share $\alpha_l \geq \overline{\alpha}$, a single legislator chooses the same policy that two legislator would choose for that share of surplus.

[33] However, accountability is not the unique reason justifying the existence of a second chamber as in federal systems the second chamber is used to represent the interest of the federal states.

the choice of the low cost project. However, it doesn't guarantee the accountability to the electorate since, even adding a second legislative body, the total cost of lobbying can still be compensated. The unique case where the legislator is accountable to voters without ambiguity is the case where the lobby doesn't get any share of surplus. Indeed it is trivial to verify that in this case the lobbying activity doesn't generate any revenue and therefore the electoral loss cannot be compensated:

Corollary 1 *In the first mandate, if the lobby gets a share* $\alpha_l = 0$*, then in the unicameral system the policy* $\left(1, a_A, C^L\right)$ *is chosen.*

To summarize, when the lobby power is high then the surplus generated by lobbying is big and therefore the electoral loss can be compensated. This implies that the lobby obtains her most preferred policy and therefore the legislator is not accountable to voters. Increasing the number of legislative bodies is a way to make more costly the lobbying process. Therefore, our model provides a rationale for the existence of multiple legislative bodies which is a common feature of many democratic systems. However, our model also shows that this institutional device doesn't necessarily solve the accountability problem as the *cost* of lobbying can still be small enough compared to the *revenue* to imply successful lobbying. Hence our analysis helps to reconcile the contradiction between the theoretical justification for multiple legislative bodies and the stylizes fact that bicameralism tends to be associated with higher government corruption[34].

4.2 *closed rule*, heterogeneous legislators and *status quo*

In this section we consider some variations of the bicameral system described in the previous one to check the robustness of our results to alternative bicameral systems. In the legislative setting we have just analyzed both legislative bodies have proposal

[34] According to several corruption indexes, bicameral systems as Italy, Greece, Spain and Belgium show worse performance than unicameral systems like Finland, Denmark and Sweden. For a more detailed discussion on the empirical evidence, see the section on the data.

power. Suppose now that the second legislative body has *veto* power but not amendment right. This is equivalent to say that only the first legislator has proposal power. We would like to understand if, in terms of accountability, a bicameral system with equal proposal power (*open rule*) is better then a bicameral system with restricted proposal power (closed rule).

An important difference between the *open rule* and the *closed rule* is the procedure to be followed after a disagreement between the two chambers. We know that, under *open rule,* in case of disagreement, the two chambers engage in a debate before delivering a final decision, while under *closed rule* there is no debate stage. Hence, in the language of our model, if the two procedures imply a difference, this difference must be related to the policy choice in case of disagreement. Remember that we have assumed that in case of disagreement, the legislator has the possibility to realize the low cost project. If there is just one legislator it seems plausible to assume that, in case of disagreement, this legislator just decides to realize the low cost project. On the other hand, if there are two legislators, then again in case of disagreement they can decide to realize the low cost project, however, given the sequential nature of the decision making process, the two legislator need to meet again to authorize the realization of the low cost project. In this case, the debate stage in the *open rule* procedure, can be interpreted as the device that allows the two legislators to choose the low cost project after disagreement. If the two legislators after the disagreement cannot meet again to authorize the realization of the low cost project, then no project will be chosen. Hence, we say that the difference between the *open rule* and the closed rule is precisely that under the closed rule procedure, in case of disagreement, the legislators do not realize any project.

In formal terms this means that the disagreement payoffs of the three players are the following:

$$\left(\bar{V}^2{}_{A_2} = 0;\ \bar{V}^2_{A_1} = 0;\ \bar{V}^2{}_l = 0\right)$$

$$\left(\bar{V^1}_{A_2} = \alpha_{A_2} S^2\left(1, C^H\right);\ \bar{V^1}_{A_1} = \alpha_{A_1} S^2\left(1, C^H\right);\ \bar{V^1}_{l} = \alpha_{l} S^2\left(1, C^H\right)\right)$$

Therefore, comparing the *open rule* and the *closed rule* we obtain the following result:

Proposition 5 *Given the share of surplus received by the lobby, α_l, then if the share received by the lobby is such that:*

$$\frac{2\left[(a_{AA} - a_{AB}) + C^H\right] + a_{lA}}{2a_{BB} + a_{lB} + \pi} \leq \alpha_l < \frac{2\left[(a_{AA} - a_{AB}) + C^H\right] + a_{lA}}{a_{lB} + \pi}$$

in the bicameral system with open rule the low cost policy is chosen, while in the bicameral system with closed rule *the high cost policy is chosen.*

Therefore, we conclude that in terms of accountability, a bicameral system where both chambers have equal proposal power is better then a bicameral system where the second chamber has only *veto* power.

Let's move now to the analysis of the case of legislative bodies with different preferences for policy types. Since the electoral loss depends on the preferences of the two legislators, we can anticipate that the electoral incentives will be weakened by two legislators with opposite preferences. To see this formally, suppose that at the beginning of the first mandate the two exogenously given legislators belong to different parties. Hence, each party controls one branch of the parliament. The policy outcome in this case will be related to the rule selecting the policy type to be implemented, given that the two bodies disagree. Let's assume that the proposal power belong to the first legislator, so that the policy type is imposed by the chamber where the legislative process originates. Clearly the electoral incentives of the two bodies are different. The first legislator, when is reelected, chooses his most preferred policy type and gets lobby transfers, while the second legislator just obtains lobby transfers. Let's assume that the first legislator belongs to party A and the second legislator belongs to party B. Formally, the policy choice is the following:

Lemma 4 *if* $\alpha_l \geq \frac{2C^H + a_{lA}}{a_{lB} + \pi}$*, then the high cost project is chosen, otherwise the low cost project is chosen.*

Since the term $\frac{2C^H + a_{lA}}{a_{lB} + \pi}$ can be interpreted as the cost of lobbying, comparing the unicameral system and the bicameral system with heterogeneous legislators, we can see that bicameralism does not necessarily increase the cost of lobbying! Indeed, if the political race is polarized enough, the opposite holds:

Proposition 6 *suppose that the ideological distance between the incumbent A and the challenger B is such that* $C^H < (a_{AA} - a_{AB})$*, then the following holds:*

if the share received by the lobby is such that $\frac{2C^H + a_{lA}}{a_{lB} + \pi} \leq \alpha_l < \underline{\alpha}$*, then in the bicameral system the high cost policy is chosen, while in the unicameral system the low cost policy is chosen;*

if the share received by the lobby is such that $\alpha_l \leq \frac{2C^H + a_{lA}}{a_{lB} + \pi} < \underline{\alpha}$*, then in the bicameral system and in the unicameral system the low cost policy is chosen.*

The explanation for this result is the following. When legislators have opposite policy preferences, they have different electoral losses. In particular, the loss due to the payment of taxes is the same for both legislators. Regarding the policy type, the legislator that can select his most preferred type, suffers a loss when he is replaced by a challenger. On the contrary, the legislator with opposite preferences gains from the change of incumbent because, even if he will not be in office, he will enjoy the policy choice of a challenger sharing his own preferences for the policy type. The result is that the loss from policy type of the first legislator is offset by the gain in policy type of the second legislator. Therefore the only source of electoral loss will be the payment of taxes. On the other hand, in the unicameral system, the cost of lobbying includes the loss in terms of policy type. When this loss is important because the political race is polarized, then the unicameral system provides better electoral incentives then the bicameral system.

The concept of two chambers controlled by different parties is very similar to the idea of divided government in Alesina and Rosenthal (1995). However, although in

Alesina and Rosenthal divided government works in favor of the median voter, in our model this is not the case. Specifically, Alesina and Rosenthal state "*divided government occurs because moderate voters like it, and they take advantage of "checks and balances" to achieve moderation. In dividing government, the voters force parties to compromise: divided government is a remedy to political polarization*". Our conclusions on polarization and divided government are different for several reasons. First, our policy space is multidimensional, and therefore beside the ideological dimension on which voters have different preferences, there is a monetary dimension on which voters have identical preferences. Second, an interest group with opposing interests on the monetary dimension bribes legislators to take a policy decision against voters interests'. Finally, as legislators are policy-motivated on the ideological dimension, the cost of bribing is increasing in ideological distance between the incumbent legislator and the opponent. Hence, although the median voter looses from party polarization on the ideological dimension, he gains on the monetary dimension when party polarization makes the legislator accountable. At this point we do not ask whether the median voter prefers a polarized political race with accountable legislators to a non-polarized political race with corrupt legislators, since we assume that the polarization is exogenous and we examine the consequences in terms of accountability[35]. Indeed, to avoid this issue we also prevented the median voter from actually dividing the government in terms of policy choice on the ideological dimension, since we assumed that the chamber where the legislative process initiates dictates the choice of the ideological dimension, so that the monetary component is the only object of negotiation.

To complete this analysis on bicameralism and accountability, we would like to discuss another example where bicameralism is neutral. Suppose that we have an economic environment where there is already a policy in place (*status quo* policy). Suppose that voters prefers some other policy different from the status quo, hence they would like a reform. On the other hand, the policy preferred by the lobby is

[35] In a companion paper (Testa 2003) we show that there are cases where the median voter prefers the polarized political race and hence we will prove how party polarization may arise in equilibrium.

the *status quo*. For the reform to be implemented, both legislator must agree. In case of disagreement the *status quo* policy remains in place. In this case, if we have a bicameral system, voters need the approval of two legislative bodies to obtain the reform, while the lobby just needs the negative decision of one legislative body to maintain the status quo. In formal terms, when there is lobbying for the *status quo*, the lobby has to bargain only with one legislator, since all she needs is that one legislator chooses a policy different from the other. Therefore, the lobby obtains the *status quo* under the same conditions she would obtain her most preferred policy in the unicameral case. It is clear that in this case the existence of a second legislator is neutral since the cost of lobbying doesn't change compared to the one legislator case. Hence, in the case of lobbying for the *status quo*, the number of legislators does not help to solve the accountability problem.

To summarize, the main results of this analysis on legislative procedures and accountability are the following. When the surplus from lobbying is high enough to compensate the electoral loss, then bicameralism could make lobbying more expensive, thereby increasing accountability. In this case, two legislative bodies with identical policy preferences and same proposal power (*open rule*) represent the best bicameral system for accountability purposes. A bicameral system with legislators belonging to the same party and proposal power of the first legislator (closed rule) still improves accountability, but to a minor extent compared to the equal power system. As legislators become heterogeneous in party membership, electoral incentives from policy type vanish and therefore bicameralism is not necessarily better than unicameralism. Finally, bicameralism is neutral for accountability when the interest group is lobbying for a policy that is already in place (*status quo* policy) because, to maintain the *status quo* policy, the lobby just needs to obtain a negative decision of one legislator.

5 Polarization and accountability

The objective of this paper was to compare different institutional frameworks in order to understand which legislative arrangement make the government more accountable to voters. However, our model, stressing the difference of incentives provided to the policy makers by voters and lobbies, also provides useful insight about other aspects of the political game that may affect accountability. In particular, it shows that there is a precise relationship between the *polarization* of the political race and the ability of voters to discipline legislators.

To see how polarization affects accountability, consider the characterization of the equilibrium in the one legislator case. In terms of policy outcomes, different equilibria arise in which $\left(1, C^H, a_j\right)$, $\left(1, C^L, a_j\right)$ are selected. Therefore, in some cases voters are able to discipline the policy maker obtaining their first most preferred policy outcome, $\left(1, C^L, a_j\right)$. On the other hand, we also observe cases where the lobby gets his most preferred policy outcome $\left(1, C^H, a_j\right)$. Which factors make the incumbent more or less accountable to the voters? We know that, given the objective function of the policy maker, voters and lobby provide different kind of incentives, respectively electoral and monetary incentives. The electoral incentives work via the individual preferences for policy types: policy-makers are policy-motivated actors on the ideological dimension of the policy and therefore they value the reelection as a mean to obtain their most preferred policy type. Hence, when replaced by a challenger, an incumbent policy-maker incurs into a utility loss because the challenger will choose a policy type different from the incumbent's most preferred type. Monetary transfers can compensate this loss. Consequently, when the lobby offers a payment to obtain the policy, the transfer must be sufficient to compensate the loss the incumbent will suffer being replaced by a challenger.

Clearly the electoral loss will depend on the distance between the incumbent and the challenger ideological position: the higher the distance, the higher the loss. When the electoral loss is higher than the surplus from lobbying, then the legislator will choose the policy preferred by voters. Therefore we conclude that polarization in

party positions has a positive effect on the accountability of policy-makers to voters. Furthermore, our model shows that the *polarization result* is robust to alternative specifications of the bargaining game (alternative disagreement payoffs).

To summarize, one result of our analysis is that, when a lobby is trying to get influence on policies, the polarization of party positions is the key ingredient of the political race that allows the voters to discipline policy-makers. Another conclusion we draw from our model is that the degree of polarization necessary to keep the policy-maker accountable is increasing in the bargaining power of the lobby group. Therefore, if we believe the anecdotal evidence that the lobbying effectiveness varies across countries, this model suggests two factors which could explain differences across countries: the degree of polarization in party positions and the distribution of bargaining power between lobbies and policy-makers.

To complete this discussion on the polarization result, a clarification on the notion of polarization and a comparison with the related literature is in order here. In our model, the polarization refers to the location on the ideological dimension of the candidates competing for the election. We do not make any particular assumption on the polarization of voters with respect to the ideological dimension of the policy. The reason for this choice is that what really matters from our perspective is not the polarization of individual preferences but the polarization of selected policies. Since selected policies are the result of the individual preferences aggregation through the political process, our focus is on the political process. At this stage we do not study yet how parties choose to locate, but taking for given that different locations on the ideological dimension are possible, we discuss the effect of different equilibrium locations on the policy outcome and we show how different equilibrium locations affect accountability.

To see that the polarization of policies more than the polarization of preferences is the crucial issue, suppose that voters are polarized on the ideological dimension. The crucial assumption that guarantees the robustness of our results to different distributions of voters is the political salience of the non-ideological dimension of

the policy[36]. Therefore, when we introduce different distributions we have verify the restrictions on individual preferences which insure that the assumption 1 is satisfied. When voters are not polarized, we know that the symmetry of the candidates around the median voters guarantees that the non-ideological dimension is politically salient. *Figure (a)* illustrates this case. Suppose now that voters are polarized as in *figure (b)* and *figure (c)*. In the first case of *figure (b)*, the symmetry of A and B around the median voter m, again implies that C is politically salient. In the case of *figure (c)*, the symmetry is not sufficient to insure that a citizen preferring A to B on ideological ground will switch his vote from the incumbent A to the challenger B if the challenger is offering a policy at a low cost while the incumbent is offering a policy at high cost. Therefore, for C to be politically salient under any distribution of voters, we have to assume that voters' preferences are such that the gain from obtaining the most preferred policy cost is higher than the gain from obtaining the most preferred policy type. In more formal terms, given the candidates A and B, let i be a citizen with preferences for the policy types such that $a_{iA} > a_{iB}$ with $a_{ii} \geq a_{ij}$ for $i \neq j$.

[36] Remember that the political salience assumptions is $\mid a_{mA} - a_{mm} \mid = \mid a_{mB} - a_{mm} \mid$.

figure (a)

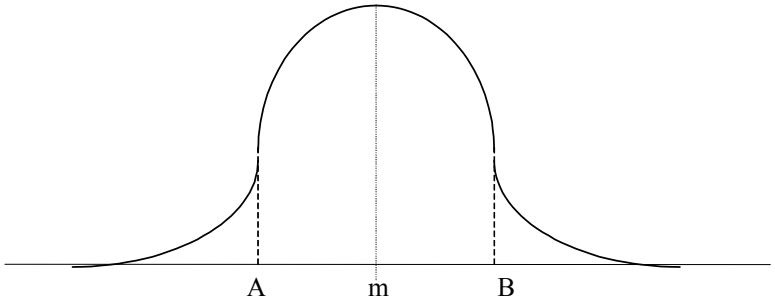


figure (b)

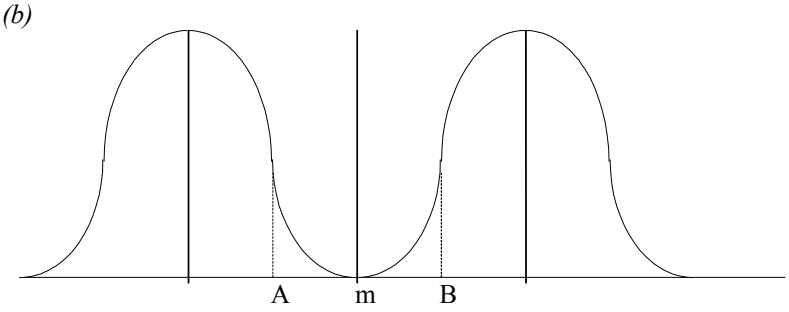


figure (c)

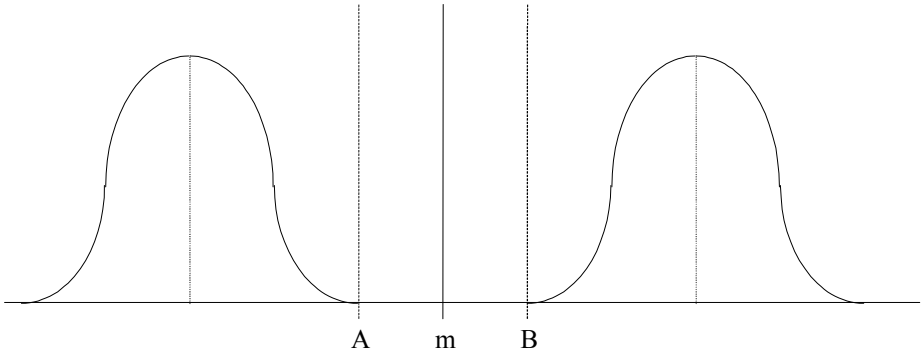


Figure 2 - distribution of preferences

The following assumption implies that $C \in \left\{C^L, C^H\right\}$ is politically salient:

Assumption 2 : $\left|C^L - C^H\right| > |a_{iA} - a_{iB}|$

Provided that C is politically salient, it is clear that the positive effect of a political race where candidates are polarized on the ideological dimension will be preserved when citizens also are polarized. Indeed, voters' polarization could be assumed as a base for party polarization as in Besley-Burgess (2000). However, in Besley-Burgess (2000) it is also shown that the effect of polarization is ambiguous; on one hand polarization is necessary to provide electoral incentives, on the other if the voters that have an interest to punish/reward the policy-maker for his performance on the non-ideological issue are too polarized on the ideological one, then it is less likely that they are willing to swing their vote on the ideological dimension. This difference on the polarization result depends on the different assumptions on the information setting. In Besley-Burgess (2000) there are two types of policy makers - "good" and "bad" - randomly selected. Rational voters anticipate the policy outcome each candidate would deliver but they remain uncertain on the policy maker type. Therefore, whether or not a rational voter will switch his voting from a candidate sharing his own ideology to a candidate having an opposite ideology depends on the difference in the likelihood they are going to choose their most preferred non-ideological policy dimension, that is in the likelihood they are good. On the contrary, in our model, since there is no uncertainty about the non-ideological dimension of the policy that will be selected through the bargaining process, the assumption of political salience is sufficient to switch the vote from a policy maker choosing an high cost to a policy maker choosing a low cost, for every ideological location of the two candidates. In terms of Besley-Burgess (2000), this would equivalent to say that in our model citizens know that the challenger and the incumbent are of the same type because they are both willing to accept a future lobby proposal . Therefore the unique variable affecting the reappointment decision is the cost delivered by the incumbent in the first period; punishing the incumbent that accepted a lobby proposal is the

unique instrument voters have to induce the incumbent to reject a first period lobby proposal. Hence we conclude that when policy makers cannot build in reputation, the polarization of the candidates participating to the political race unambiguously increases government's accountability.

As a final remark, our analysis allow us to interpret from a different perspective the results of other streams of literature focusing on the implication of polarized citizens' preferences for the public decision making. For example, in Alesina-Baqir-Easterly (1999) it is shown that the polarization of individual preferences for different types of public good has a negative impact on the amount of public good provided when the tax level and the amount of public good are decided by majority voting. The explanation for this result is that the distance between the selected policy type (median) and the policy type preferred by each individual is increasing in the distance of each individual from the median voter. Therefore, the more polarized the society, the less satisfied the individuals are with the policy preferred by the median voter and the less willing the citizens will be to devote taxes for public spending. Note that in Alesina-Baqir-Easterly (1999), even though the society is polarized, there is no polarization in the political race. Therefore, what drives the result in the model is not only the polarization of the society but also the convergence of political parties to the median voter. In other words, the polarization of citizens' preferences is not sufficient to create competition among them unless the political race is such that the selected policy type is the median one.

To conclude, if we want to evaluate the consequences of polarized individual preferences for public decision making we have to be aware of the fact that polarization in society is different from polarization in the political race; how do we go from a more or less polarized society to a more or less polarized political race is a question that we do not address in this analysis[37]. However, since polarization in political race ultimately determines selected policies, it is important to understand how it

[37] The issue of endogenous party polarization has been analysed in a recent paper by J. Svensson, "*Controlling Spending: Electoral Competition, Polarization and Endogeneous Platforms*", mimeo April 2000.

affects policy-maker's incentives and performance. Therefore, we study the effect of polarization in political race (for any given polarization in society) and we find an unambiguously positive effect on policy-makers' accountability. The non-ambiguity result rests on the assumption of voters' perfect information on the non-ideological dimension of the policy that will be selected by policy-makers.

6 Empirical Analysis

In this section we will present an empirical investigation to verify the consistency our model with the data.

To carry on an empirical test of our theoretical predictions we collected data on bicameralism, party polarization and legislator accountability for 43 democratic countries. Our main data source is the CDI-World Bank Database on Political Institutions. In our sample, half of the countries are unicameral and half are bicameral, as it is shown in *table 1*. A country is classified as bicameral when the two existing chambers have effective legislative power[38]. For bicameral systems, we do not have any information on whether they use the open rule or the closed rule in the legislative process, hence this aspect of our model cannot be captured by the data.

Concerning the data on parties, the Database on Political Institutions classifies government and opposition parties as center, left and right. Based on this information, we can construct an index of party polarization measuring the distance between the incumbent party and the challenger. Since in our sample we have both majoritarian and proportional systems, we do not always have a unique incumbent party and a unique challenger, as it would be in a two-parties systems with majoritarian electoral rule. Therefore, to measure the ideological distance between incumbent and challenger in the spirit of our model, we decided to take the distance between the major party in government and the major party in opposition as a measure of party

[38] Hence, for example, the United Kingdom is classified as a Unicameral system since the second chamber has restricted legislative power.

polarization. We construct then an index that takes value zero, one or two, depending on how the two parties are labeled on the center, left, right spectrum. Hence, an index of zero means that the two parties have the same label, an index of two means that one party is left and the other is right, and index equal to one means that one party is labeled center and the other is either left or right. The DPI also provides us with information on the heterogeneity of legislators policy preferences that is crucial in our model to determine the effectiveness of bicameralism. In particular, for our purpose we can use the index of legislature fractionalization defined as the chance that two random draws will produce legislators from different parties. We also have a measure of the maximum difference of orientation among government parties (that takes again values between zero and two) and we know if the party of the executive has the control of all the relevant houses.

Besides data on political institutions and parties, we need a measure of legislators' accountability. Ideally, we would like to compare public projects of the same type in different countries to see whether the same policy is implemented at different cost. So far, however, we are not aware of data from which we could extract this type of information. Therefore, we decided to use corruption indexes as an indirect measure of legislators' accountability. Several corruption indexes are available from different sources[39]for the '80s and '90s, however to match the corruption data with the data on political polarization and to obtain a sample that was not restricted to the OECD countries, we can use only one index of corruption. The corruption index we use is the Knack and Keefer measure of corruption (1980-89). This corruption index measures corruption on a 0-6 scale assigning a score to each country, where 1 is assigned to the most corrupt country and 6 to the least corrupt.

Finally, we collected data to control for other relevant socio-economic and geographic factors that, according to the existing literature (La Porta et all (1999) and Treisman 2000), may influence corruption. These includes gross national income percapita (GNI percapita), population, trade as a percentage of the GDP, education,

[39]Two main sources of corruption indexes are *Transparency International* and the *International Country Risk Guide (ICRG).*

religion, civil and political rights, ethnolinguistic fragmentation, geographic dummies, colonial origin and legal origin[40].

In *table 2* we report the correlations between the main variables. We can see that higher GNI percapita is associated with higher education, better civil and political rights (freedom) and lower corruption. The corruption index is also strongly positively correlated with the level of education and the degree of freedom[41]. Concerning the main variables we are interested in this work, political polarization and bicameralism are positively correlated with the corruption index, with the first variable being more correlated than the second to the corruption index.

In *table 3*, we report the means for the corruption index and several other variables according to the degree of polarization of the political system, the parliament characteristics (unicameral and bicameral) and the colonial origin. The mean degree of corruption for countries with no polarization is higher than for countries with medium and high degree of polarization. The difference is substantial and statistically significant. The mean corruption is slightly higher in unicameral systems than in bicameral, although the mean difference is very small and not significant. With respect to the colonial origin, colonies have a higher corruption than non colonies. Among colonies, Spanish colonies have higher corruption than UK colonies. In *table 4a* and *table4b* we report the corruption ranking for the overall sample and the corruption ranking by geographic location (means).

We can know try to test the main results of our model. Our model predicts that the polarization of the political race has a positive effect on the legislator's accountability, while the effect of bicameralism on accountability is ambiguous. On one hand bicameralism, increasing the cost of lobbying, can increase accountability. On the other hand , if multiple legislators have different policy preferences, then bicameralism can offset the electoral incentives leading to less accountability then

[40] The detailed description of the data is provided in appendix. For a detailed discussion of the effects of religious tradition, legal culture and colonial heritage on corruption see Triesman, Daniel, [2000], The Causes of Corruption: A Cross National Study, Journal of Public Economics, 76, 399-457

[41] The variable freedom measures the civil and political rights of a country.

unicameralism, especially in the case of a quite polarized electoral race. Therefore, the effectiveness of bicameralism depends both on the policy preferences of the legislators and on the political polarization. In summary, we would like to test the following results:

H1: Party polarization decreases corruption.

H2: Bicameralism decreases corruption when multiple legislators have the same policy preferences (for any degree of party polarization).

H3: Bicameralism is neutral or decreases corruption when multiple legislators have different policy preferences and party polarization is low.

H4: Bicameralism increases corruption when multiple legislators have different policy preferences and party polarization is high.

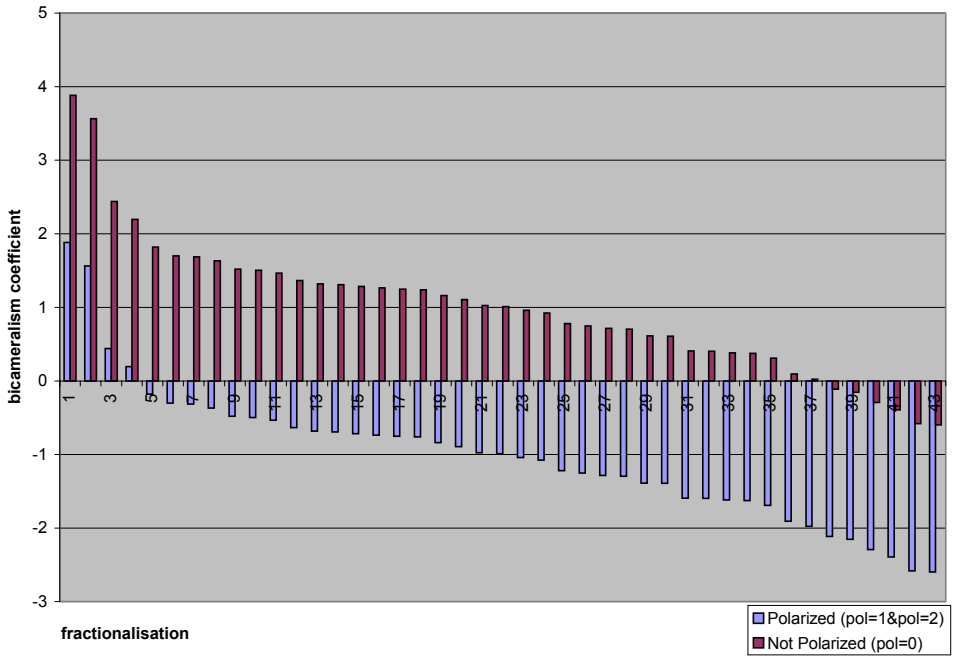
The main variables of our interest are therefore party polarization, bicameralism and policy preferences of legislators measured by the legislature fractionalization. From our data, we construct three dummies of party polarization, namely $pol0$, $pol1, pol2$, for the three values of polarization (zero, one and two) and a dummy for the bicameralism denoted bic, taking value zero when a country is unicameral and one when a country is bicameral. Our model suggests that besides the direct effect of polarization and bicameralism on corruption, there is an interaction between bicameralism and polarization and bicameralism and fractionalization. We take this into account introducing in our regressions interaction terms between bicameralism and polarization and bicameralism and fractionalization. Hence, denoting $corr$ the dependent variable (corruption index), $frac$ the measure of legislature fractionalization and Δ the vector of all the other socio-economic controls, the equation we want to estimate takes the following form:

$$corr = \alpha_1 pol1 + \alpha_2 pol2 + \beta bic + \gamma_1 pol1bic + \gamma_2 pol2bic + \delta frac + \lambda fracbic + \theta\Delta + \epsilon$$

We report in table 5 the results of our estimations. In the first two columns we report the estimated coefficient of the regression without the interaction between fractionalization and bicameralism. The coefficients of party polarization, α_1 and α_2,

are positive as we expected but significant only for the highest degree of polarization (polarization=2). The coefficient of bicameralism, β, is also positive, although not very significant. The two coefficients of the interacted terms, γ_1 and γ_2 , are negative, but only the interaction between high polarization and bicameralism is significant. Note that, the sum of the coefficients $(\beta + \gamma_1 + \gamma_2)$ is negative, hence when party polarization is high, bicameralism increases corruption. From our model we know that this is possible if multiple legislators have heterogenous policy preferences that counterbalance political incentives. Hence, if the negative effect is due to heterogeneity of policy preferences, we expect that introducing the interaction between fractionalization and bicameralism, this new term will entirely explain the negative effect of bicameralism on the corruption index. In columns (3) and (4) of the table 5 we report the coefficient when both interactions are introduced. As we can see, the coefficient of the interaction term between fractionalization and bicameralism is negative and significant. Importantly, once we introduce the interaction between bicameralism and fractionalization, the sum of the coefficients $(\beta + \gamma_1 + \gamma_2)$ becomes positive, meaning that bicameralism associated with high polarization decreases corruption if legislators have homogeneous policy preferences. On the other hand the sign of the overall coefficient of bicameralism with fractionalization, $(\beta + \gamma_1 + \gamma_2 + \lambda frac)$, depends on whether the political race is polarized or not. If we consider the case were the political race is not polarized, i.e. $Pol1 = 0$ and $Pol2 = 0$, then we obtain that the coefficient of bicameralism $(\beta + \lambda frac)$ is always positive and decreasing with the degree of fractionalization. Conversely, if the political race is polarized, i.e. $Pol1 = 1$ and $Pol2 = 1$, we obtain that the coefficient is negative and decreasing with fractionalization. *Figure 3* represents a graph showing how the coefficient of bicameralism estimated in column (4) changes with the fractionalization of the legislature, depending on whether the political race is polarized or not.

Figure 2 :Bicameralism and Fractionalisation



Using *table 5* we can compare the results for alternative specifications, where we introduce a number of political, socio-economic, geographic and colonial controls. Some results are not robust to alternative specifications. In particular, column (4) shows that the results on party polarization, bicameralism and fractionalization are robust to the introduction of all the socio-economic controls[42]. Column (5) shows the effect of introducing other political controls such as the maximum degree of heterogeneity of government parties (govfractio) and whether or not the party of

[42] The Socio-Economic controls we use are gross national income per capita, population (log), trade as a percentage of GDP, civil and political right, ethnolinguistic fragmentation, religion and regional dummies. We dropped the education because of the very high correlation with the gross national income percapita. The GNI percapita and trade as a percentage of GDP are the most significant coefficients with positive sign. The degree of freedom has also a positive sign and is not completely insignificant. The ethnolinguistic fragmentation has a negative sign and is not significant. All the religious controls have positive sign except for the Muslim dummy. Among the geographic controls, the Latin America dummy is the most significant with a negative sign. The detailed tables with all the coefficients and t-values for religion an regional dummies are reported in *table 6* and *table7*.

the executive controls all the relevant houses (allhouse)[43]. As we can see, most of the coefficients of our political/institutional controls are not affected, apart from the coefficient of party polarization that becomes slightly less significant. In columns (6) to (9) we present the regressions with all the socio-economic controls and the colonial controls[44]. When we add the colonial controls, the size and signs of all the coefficient of the main political controls (polarization, bicameralism and interacted terms) are not affected, however their significance drops substantially [45], with the exception of the coefficient of high polarization and the interaction between bicameralism and high polarization, that remain significant.

As a final remark, this empirical test can be affected by endogeneity problems that are common to all these type of analysis. Nevertheless, we carried on this exercise in the spirit of the existing empirical literature to have a sense of whether the correlations in the data show some consistency with the predictions of our model. Hence, based on our analysis of the data we conclude that the empirical findings are consistent with our theoretical results.

7 Summary of results and conclusions

The purpose of this paper was to provide a theoretical framework to study the effect of legislative arrangements on policy outcomes and legislators accountability. Legislators are expected to serve voters interests; however, the electorate interests may be in conflict with lobbies interests which exert pressure on legislators. If pressure groups successfully lobby legislators, then the accountability of the legislators to the voters is compromised. The question to which this paper seeks an answer is whether

[43] The heterogeneity of government parties has a negative effect on corruption, while the fact that the party of the executive has the control of the relavant houses ha positive effect. None of the two coefficient is significant though.

[44] The colonial origin and legal origin dummies have all positive signs and the colonial origin coefficients are the most significant. The coefficients and t-statistics for these variables are reported in *table 7*.

[45] These results are not surprising given the small size of our sample. Also, as we can see, those coefficients never become completely unsignificant.

or not legislative arrangements affect the lobby power to distort policy choices from the most preferred voters outcomes. We compare two types of legislative arrangements: unicameralism and bicameralism. In a unicameral system the legislature is characterized by a unique legislative body deciding on the policy; in a bicameral system two legislative bodies have to pass a policy proposal. An advantage of the unicameral system is the faster approval of a policy proposal. However, the advocates of the bicameral system argue that, a second legislative body, making lobbying more difficult, may improve accountability. In other words, when lobbies trade money for policy favors, two legislative bodies should be more difficult to buy than one. If this view was correct, we should expect that bicameralism increases accountability. Our theoretical analysis deals formally with this question using a model where legislators interact with lobby through a bargaining process and with voters by means of elections.

The main result of the model is that the share of surplus captured by lobby and the polarization of the political race are the major determinant of the policy choice. In particular, when the share of surplus received by the lobby is sufficiently high to compensate the electoral loss, then the lobby obtains here most preferred policy and the legislator is not accountable to voters. In this case, the introduction of a second legislator, increasing the electoral loss, may improve accountability. However, the effectiveness of the bicameral systems crucially depends on the rule governing the functioning of the two elected bodies and on the policy preferences of the decision-makers. The decision power of the two bodies is particularly important. We find that, for accountability purposes, two legislative bodies with equal decision power provide the best incentives. Two legislative bodies with different decision power still improve accountability but to a minor extent then two legislative bodies with equal powers. However, if the two legislative bodies are controlled by opposite parties, most of the electoral incentives vanish and bicameralism could be worse then unicameralism for accountability purposes. We also carried on an empirical test of our model and the evidence from a cross-country analysis including 43 democracies with different legislative structures (unicameral and bicameral) is consistent with our theoretical

findings.

Another an important message of our analysis is that, if the two legislative bodies have very low bargaining power or if the political race is not polarized, then the bicameral system doesn't necessarily solve the accountability problem. Hence our study suggests that, even when bicameralism is not detrimental to accountability, focussing on this institutional feature can be misleading since, to solve the accountability problem, priority should be given to other institutional rules that may increase the bargaining power of the legislator. This consideration suggests that further investigations on this matter should be undertaken.

A second important result of our model is that legislator's accountability is also related to the characteristics of the political race. Since legislators are policy motivated on the *type* dimension, voters can provide electoral incentives. We show that polarization in party position increases accountability. The polarization result is robust to the alternative specifications of the bargaining game and the degree of polarization necessary to keep the legislator accountable is increasing in the bargaining power of the lobby group. Our analysis focuses on the polarization of the political race, where this polarization is exogenously given. We discuss the effect introducing a polarized electorate but we do not study how the polarization of the electorate may affect polarization in candidates' equilibrium location with respect to the ideological dimension. The relationship between polarization in society and polarization in the political race remains an important open question that requires further investigation.

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Appendix

Proposition 1

Proof.

In in $t = 2$ we observe that

$$V_j\left(1, C^L\right) = V_j\left(1, C^H\right)$$

and in period 1 we observe that $V_A\left(1, C^L\right) \equiv 2a_{AA} \geq V_A\left(1, C^H\right) \equiv a_{AA} + a_{AB} - C^H$. ■

Lemma 1

Proof.

The inequalities follows from the pairs of disagreement payoffs:

$\left(\bar{V^2}_j = 0; \bar{V^2}_l = 0\right)$, $\left(\bar{V^2}_j = a_{AA}; \bar{V^2}_l = a_{lA}\right)$,

$\left(\bar{V^2}_j = a_{AA}; \bar{V^2}_l = 0\right)$, $\left(\bar{V^2}_j = 0; \bar{V^2}_l = a_{lA}\right)$

$\bar{V^2}_j = a_{jj}, \bar{V^2}_l = a_{lj}$, $S^2\left(1, a_j, C\right) = a_{jj} + \pi\left(1, C\right)$

and $\pi\left(1, C^H\right) > 0$, $\pi\left(1, C^L\right) = 0, \pi\left(0, 0\right) = 0$.

since, $S^1\left(1, a_j, C^H\right) \geq S^1\left(1, a_j, C^L\right) \geq S^1\left(0, 0, 0\right)$, hence $\left(1, a_j, C^H\right)$ is the surplus maximizing policy.

■

Lemma 2

Proof.

The inequalities follows from the four possible pairs of disagreement payoffs in the first period :

$\left(\bar{V}^1_j = \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}^t_l = \alpha_l S^2\left(1, C^H, a_l\right)\right)$,

$\left(\bar{V}^1_j = a_{AA} + \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}^t_l = a_{lA} + \alpha_l S^2\left(1, C^H, a_l\right)\right)$,

$\left(\bar{V}^1_j = a_{AA} + \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}^t_l = \alpha_l S^2\left(1, C^H, a_l\right)\right)$,-

$\left(\bar{V}_j^1 = \alpha_j S^2\left(1, C^H, a_j\right); \bar{V}_l^t = a_{lA} + \alpha_l S^2\left(1, C^H, a_l\right)\right)$,

the equilibrium voting strategy, $\Sigma_j\left(P, C, a_j\right) = \left[\sigma_{ij}\left(1, C^H\right) = 0, \sigma_{ij}\left(0,0\right) = 1, \sigma_{ij}\left(1, C^L\right) = 1\right]$

and the assumption on profits, $\pi\left(1, C^H\right) > 0$, $\pi\left(1, C^L\right) = 0, \pi\left(0,0\right) = 0$. ■

Lemma 3

Proof.

From *lemma 2* , $S^1\left(1, a_j, C^H\right) \geq S^1\left(1, a_j, C^L\right)$ if and only if $\alpha_l \geq \frac{(a_{AA} - a_{AB}) + C^H + a_{lA} - \bar{V}_l^2}{S^2(1, a_j, C^H) - \bar{V}_l^2 - \bar{V}_B^2}$.

■

Proposition 3

Proof.

The proposition follows from lemma 3 and assumption 1 . ■

Lemma 4

Proof.

the proof of lemma 4 is as lemma 3. ■

Proposition 4

Proof.

Proposition 4 follows from proposition 3 and lemma 4. ■

Proposition 5

Proof.

This proposition follows from lemma 3 and the two following assumptions:

1)under open rule the disagreement payoffs are:

$$\left(\bar{V^2}_{A_2} = a_{AA};\ \bar{V}^2_{A_1} = a_{AA};\ \bar{V^2}_l = 0\right)$$

$$\left(\bar{V^1}_{A_2} = a_{AA} + \alpha_{A_2} S^2\left(1, C^H\right);\ \bar{V^1}_{A_1} = a_{AA} + \alpha_{A_1} S^2\left(1, C^H\right);\ \bar{V^1}_l = \alpha_l S^2\left(1, C^H\right)\right)$$

2) under *closed rule* the disagreement payoffs are:

$$\left(\bar{V^2}_{A_2} = 0;\ \bar{V}^2_{A_1} = 0;\ \bar{V^2}_l = 0\right)$$

$$\left(\bar{V^1}_{A_2} = \alpha_{A_2} S^2\left(1, C^H\right);\ \bar{V^1}_{A_1} = \alpha_{A_1} S^2\left(1, C^H\right);\ \bar{V^1}_l = \alpha_l S^2\left(1, C^H\right)\right)$$

■

Lemma 4

Proof.

Lemma 4 follows from *proposition 3* and from the symmetry assumption $(a_{AA} - a_{AB}) = (a_{BB} - a_{BA})$ ■

Proposition 6

Proof.

Proposition 6 follows from proposition 3, lemma 4 and the observation that $\frac{(a_{AA}-a_{AB})+C^H+a_{lA}}{a_{lB}+\pi} \leq \frac{2C^H+a_{lA}}{a_{lB}+\pi}$ if and only if $C^H < (a_{AA} - a_{AB})$. ■

1. **Equilibrium voting strategy**

Definition:

An equilibrium of the voting game is a vector $\Sigma_j^*(P,C,a_j)$ *of individual voting decision* $\sigma_{ij}^*(P,C,a_j)$ *such that, given the sharing rules* α_j *and* α_l:

$V_{ij}\left(P,C,a_j,\Sigma_j^*(.)\right) \geq V_{ij}\left(P,C,a_{j^t},\Sigma_{j^t}(.)\right) \qquad \forall \Sigma_j(P,C,a_j) \neq \Sigma_j^*(P,C,a_j)$

Proof.

Let A be the first period incumbent and B the challenger. In what follows we prove that $\Sigma_A^* = \left[\sigma_{mA}^*\left(1,C^H\right)=0, \sigma_{mA}^*(0,0)=1, \sigma_{mA}^*\left(1,C^L\right)=1\right]$ satisfies the following definition of equilibrium voting strategy:

$V_{iA}(P,C,a_A,\Sigma_A^*(.)) \geq V_{iA}(P,C,a_A,\Sigma_A(.)) \qquad \forall \Sigma_A(P,C,a_A) \neq \Sigma_A^*(P,C,a_A)$

• Alternative voting strategy : $\Sigma_A(.) = \left[\sigma_{mA}\left(1,C^H\right)=1, \sigma_{mA}(0,0)=1, \sigma_{mA}\left(1,C^L\right)=1\right]$

Under the voting rule $\Sigma_A(.)$, choosing $\left(1,C^H,a_A\right)$ in the first period, the policy maker A remains in power in the second period. Under this voting rule, using lemma 2 we know that the agreement on $\left(1,C^H,a_A\right)$ is always reached. On the other hand, if $\sigma_{mA}\left(1,C^H\right) = 0$, creating an electoral loss, depending on the parameters of the model,either $\left(1,C^H,a_A\right)$ or $\left(1,C^L,a_A\right)$ can be reached. .In the second period, we know from proposition 2 that, independently of the voting strategy, the policy choice is always $\left(1,C^H,a_A\right)$. Note that, if $\alpha_l \geq \frac{(a_{AA}-a_{AB})+C^H+a_{lA}-\bar{V}_l^2}{S^2(1,a_j,C^H)-\bar{V}_l^2-\bar{V}_B^2}$, the voter obtains the same pay-off under the two alternative voting strategies, hence he is indifferent between, $\sigma_{mA}\left(1,C^H\right)=0$ and $\sigma_{mA}\left(1,C^H\right)=1$. On the other hand, if $\alpha_l < \frac{(a_{AA}-a_{AB})+C^H+a_{lA}-\bar{V}_l^2}{S^2(1,a_j,C^H)-\bar{V}_l^2-\bar{V}_B^2}$ then the payoff under the voting strategy $\sigma_{mA}\left(1,C^H\right)=0$ is higher then the payoff under the voting strategy $\sigma_{mA}\left(1,C^H\right)=1$,

Therefore, we conclude that:

$$V_{iA}(P,C,a_A,\Sigma_A^*(.)) \geq V_{iA}(P,C,a_A,\Sigma_A(.))$$

therefore $\Sigma_A(.)$ is not an equilibrium strategy.

• Alternative voting strategy : $\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 0, \sigma_{mA}(0,0) = 0, \sigma_{mA}\left(1, C^L\right) = 0\right]$

Under the voting rule $\Sigma_A(.)$ the incumbent is never reappointed. Therefore, the policy $\left(1, C^H, a_A\right)$ and $\left(1, C^L, a_A\right)$ generate the same electoral loss. Given that $\left(1, C^H, a_A\right)$ generates higher profits, clearly an agreement on $\left(1, C^H, a_A\right)$ will always be reached. In the second period, we know from proposition 2 that, independently of the voting strategy, the policy choice is always $\left(1, C^H, a_A\right)$. Therefore, the voter gets the policy $\left(1, C^H, a_A\right)$ in both periods. Using the voting strategy $\Sigma_A(.)$ the voter can obtain either $\left(1, C^H, a_A\right)$ or $\left(1, C^L, a_A\right)$ in the first period and $\left(1, C^H, a_A\right)$ in the second period. Therefore, $\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 0, \sigma_{mA}(0,0) = 0, \sigma_{mA}\left(1, C^L\right) = 0\right]$ is not an equilibrium voting strategy.

• Alternative voting strategy : $\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 0, \sigma_{mA}(0,0) = 0, \sigma_{mA}\left(1, C^L\right) = 1\right]$

Following the previous proof, again we compare $\Sigma_A(.)$ and $\Sigma_A^*(.)$. Using lemma 2 we can say that, $S\left(1, C^H, a_A\right) > S(0,0,0)$ under the voting strategy $\Sigma_A(.)$ does not imply $S\left(1, C^H, a_A\right) > S(0,0,0)$ under the voting strategy $\Sigma_A^*(.)$. Since when $S\left(1, C^H, a_A\right) < S(0,0,0)$, an agreement on $\left(1, C^L, a_A\right)$ is reached, then we can say that when, under the voting strategy $\Sigma_A^*(.)$, an agreement $\left(1, C^L, a_A\right)$ is reached, under the alternative voting strategy an agreement $\left(1, C^H, a_A\right)$ can be reached. Therefore, given that voters strictly prefer $\left(1, C^L, a_A\right)$ to $\left(1, C^H, a_A\right)$, then again Therefore again $V_{iA}\left(P, C, a_A, \Sigma_A^*(.)\right) \geq V_{iA}\left(P, C, a_A, \Sigma_A(.)\right)$

Since the three alternative voting strategies:

$\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 1, \sigma_{mA}(0,0) = 1, \sigma_{mA}\left(1, C^L\right) = 1\right]$

$\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 0, \sigma_{mA}(0,0) = 0, \sigma_{mA}\left(1, C^L\right) = 0\right]$

$\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 0, \sigma_{mA}(0,0) = 0, \sigma_{mA}\left(1, C^L\right) = 1\right]$

do not satisfy the definition of equilibrium voting strategy, then from the preference ordering $V_m\left(1, C^L, a_j\right) > V_m(0,0,0) > V_m\left(1, C^H, a_j\right)$, it follows that also the alternative voting strategies:

$\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 1, \sigma_{mA}(0,0) = 1, \sigma_{mA}\left(1, C^L\right) = 0\right]$

$\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 1, \sigma_{mA}(0,0) = 0, \sigma_{mA}\left(1, C^L\right) = 0\right]$

$\Sigma_A(.) = \left[\sigma_{mA}\left(1, C^H\right) = 0, \sigma_{mA}(0,0) = 1, \sigma_{mA}\left(1, C^L\right) = 0\right]$

cannot satisfy the definition of equilibrium voting strategy. Therefore we conclude that:

$V_{iA}(P, C, a_A, \Sigma_A(.)) \leq V_{iA}(P, C, a_A, \Sigma_A^*(.)) \qquad \forall \Sigma_A(P, C, a_A) \neq \Sigma_A^*(P, C, a_A)$.

■

Data Appendix

List of variables: definitions

• **Corruption**: the corruption index, taken from the Easterly and Levine Dataset, is the Knack and Keefer measure of corruption (1980-89). The corruption index measures corruption on a 0-6 scale assigning a score to each country, where 1 is assigned to the most corrupt country and 6 to the least corrupt. Source: CDI-World Bank data base on political institutions.

• **Polarization**: the polarization index measures the ideological distance between the major party in government and the major party in opposition. We constructed this index from the information on the political parties taken from the CDI-World Bank data base on political institutions (DPI). The DPI classifies parties with the label CENTER, LEFT and RIGHT. Our index of polarization takes value zero when the major party in government and the major party in opposition have the same label, one when one party is CENTER and the other is either LEFT or RIGHT and two when one party is LEFT and the other is RIGHT. Year: 1989 - *Source*: CDI-World Bank data base on political institutions

• **Bicameralism**: this variable is a dummy taking value zero when the country as a unicameral system and two when the country has a bicameral system. Year: 1989 - *Source*: CDI-World Bank data base on political institutions and European Integration Data Set, version 2 (24.03.2002) compiled by Ivan Barankay and Daniel Sturm.

• **Fractionalization**: the legislature fractionalization is defined as the chance that a random draw will produce two legislators from different parties. Year: 1989 - *Source*: CDI-World Bank data base on political institutions

• **Allhouse**: this variable is a dummy that takes value one when the party of executive controls all relevant houses. Year: 1989 - *Source*: CDI-World Bank data base on political institutions.

• **Govfractio**: maximum degree of orientation among government parties taking values 0-2. Year: 1989 - *Source*: CDI-World Bank data base on political institutions

• **GNIpercapita**: gross national income percapita. Year: 1989 - *Source*: World Development Indicators Database.

• **Population**: the data come from the World Development Indicators Database. Year: 1989.

• **Trade**: trade as a percentage of the GDP. Year: 1989 - *Source*: World Development Indicators Database.

• **Freedom**: Index of political right and civil liberties. Year: 1989 - This index takes value 1-7 and is constructed by Freedom House that classifies countries as "Free," "Partly Free," or "Not Free" Those whose ratings average 1-2.5 are considered "Free," 3-5.5 "Partly Free," and 5.5-7 "Not Free." To make presentation of results easier, we multiplied the index by -1.

• **Elf**: ethnolinguistic fragmentation index. *Source*: T. Persson, G. Tabellini and F. Trebbi, dataset for "Electoral Rules and Corruption".

• **Education**: average years ot total schooling of the total population during the '80. Years: 1980, 1985. *Source*: Barro-Lee Dataset.

• **Religion**: The data on the share of total population belonging to Roman Catholic religion and Protestant religion are taken from T. Persson, G. Tabellini

and F. Trebbi, dataset for "Electoral Rules and Corruption", the dummies on Muslim and Buddism have been constructed from the information available on the CIA World Factorbook.

• **Colonial origin**: the colonial origin dummies are taken from T. Persson, G. Tabellini and F. Trebbi, dataset for "Electoral Rules and Corruption", the three legal origin dummies colouk, colofr, coloes refer to UK colonial origin, French colonial origin and Spanish legal origin.

• **Legal origin**: the legal origin dummies are taken from T. Persson, G. Tabellini and F. Trebbi, dataset for "Electoral Rules and Corruption", the three legal origin dummies legoruk, legorfr, legorge refer to UK legal origin, french legal origin and German legal origin.

• **Ever colony**: this is a dummy variable taking value of 1 if a country has ever been a colony since 1776 and zero otherwise. *Source*: T. Persson, G. Tabellini and F. Trebbi, dataset for "Electoral Rules and Corruption". .

Tables

Table 1 – Unicameral and Bicameral States

Unicameral	Bicameral
Botswana	Argentina
Costa Rica	Australia
Denmark	Austria
Ecuador	Belgium
El Salvador	Bolivia
Finland	Brazil
Greece	Canada
Guatemala	Colombia
Honduras	France
Ireland	Germany
Israel	Italy
New Zealand	Japan
Nicaragua	Mexico
Norway	Netherlands
Paraguay	Pakistan
Peru	South Africa
Portugal	Spain
Senegal	Switzerland
Sri Lanka	Thailand
Sweden	United States
Turkey	Uruguay
United Kingdom	

Table2 -Averages by category

Mean	Pol=1&2	Pol=0	bicameral	unicameral	colony	nocolony	ukcolony	spaincolony
corruption	4.525144*	3.501276*	4.357993	4.033144	3.774447	4.970833	4.284392	2.894231
GNIperc	11801.03	7772.857	12737.14	8344.091	7655	15780.67	8776.667	4257.692
pop	3.95E+07	2.11E+07	5.66E+07	1.15E+07	2.21E+07	5.48E+07	2.46E+07	2.75E+07
edu	6.858276	5.3225	6.639524	6.089773	5.849464	7.308	6.514444	4.475385
freedom	2.188276	3.092143	2.389524	2.571364	2.998929	1.518667	2.841111	3.562308

*means difference statistically significant, p-value=0.0184

Table 3a – Partial correlations

	corr	polar	bic	fractio	GNIpc	trade	Pop
corruption							
polarization	0.356						
bicameralism	0.108	-0.045					
fractionalisation	0.208	-0.019	0.28				
GNIperc	0.831	0.285	0.313	0.347			
trade	0.298	-0.06	-0.238	0.169	0.111		
population	0.029	0.144	0.473	-0.039	0.208	-0.501	
catho	-0.367	-0.391	0.144	0.148	-0.274	0.016	-0.128
prot	0.613	0.258	-0.132	0.218	0.56	0.109	-0.051
muslim	-0.309	0.231	-0.085	-0.255	-0.318	-0.143	0.136
budd	-0.073	-0.17	0.098	-0.144	-0.09	-0.052	0.179
edu	0.785	0.29	0.098	0.279	0.843	0.123	0.075
freedom	-0.711	-0.322	-0.059	-0.229	-0.764	-0.213	-0.018
elf	-0.337	-0.136	0.06	-0.243	-0.397	0	-0.046
colony	-0.38	-0.242	-0.261	-0.256	-0.552	0.023	-0.326
colony uk	0.032	-0.006	-0.045	-0.374	-0.126	0.064	-0.097
colony fr	-0.123	0.13	-0.151	-0.426	-0.206	0.008	-0.085
colony es	-0.569	-0.335	-0.035	0.012	-0.585	-0.233	-0.083
legor_uk	0.192	0.069	0.015	-0.265	0.043	0.09	0.193
legor_fr	-0.548	-0.223	-0.022	-0.02	-0.486	-0.118	-0.145

Notes: the detailed description of the variables and their sources are in the appendix

Table 3b – Partial correlations

	catho	prot	muslim	budd	edu80	freed	elf
catho							
prot	-0.491						
muslim	-0.332	-0.174					
budd	-0.328	-0.172	-0.075				
edu	-0.354	0.621	-0.394	-0.035			
freedom	0.125	-0.358	0.372	0.01	-0.705		
elf	-0.126	-0.179	0.399	0.012	-0.333	0.52	
colony	0.187	-0.184	0.009	-0.183	-0.248	0.458	0.35
colony uk	-0.21	0.006	0.084	0.084	0.029	0.12	0.261
colony fr	-0.174	-0.099	0.563	-0.042	-0.229	0.141	0.417
colony es	0.642	-0.356	-0.18	-0.18	-0.442	0.461	0.035
legor_uk	-0.453	0.015	0.033	0.237	0.239	-0.02	0.308
legor_fr	0.673	-0.545	0.072	-0.294	-0.57	0.319	-0.026

Notes: the detailed description of the variables and their sources are in the appendix

Table 4a – Corruption ranking

Country	corr89
Canada	6
Sweden	6
Denmark	6
Netherlands	6
Finland	6
Norway	6
Switzerland	6
New Zealand	6
United kingdom	5.8125
South Africa	5.642857
Belgium	5.625
France	5.4375
United States	5.3125
Austria	5.25
Japan	5.1875
Ireland	5.1875
Germany	5.1875
Australia	5.1875
Costa Rica	5
Israel	5
Spain	4.5
Nicaragua	4.25
Portugal	4
Botswana	3.916667
Greece	3.875
brazil	3.875
Italy	3.8125
Argentina	3.6875
Ecuador	3.1875
Thailand	3.1875
Uruguay	3
Senegal	3
Colombia	3
sir lank	3
turkey	2.875
Mexico	2.75
Peru	2.6875
Guatemala	2
el Salvador	2
Honduras	2
Pakistan	1.625
Bolivia	1.25
Paraguay	0.9375

Table 4b- Corruption ranking (means)

	corruption (mean)	obs
Oecd	5.35119	21
Africa	4.229167	3
Middle East	3.9375	2
Latin	2.830357	14
Asia	2.604167	3

Table 5 – OLS regressions, dependent variable: corruption index

Controls	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Political/Institutionals									
polarization=1	0.5819	0.7158	0.7624	0.7862	0.9339	0.7890	0.8536	2.0280	2.2256
	(0.89)	(1.07)	(1.24)	(1.13)	(1.03)	(0.83)	(0.79)	(1.53)	(1.47)
polarization=2	1.0098	1.1272	1.1286	1.1239	1.0609	1.1288	1.1726	1.4067	1.4626
	(2.71)	(2.78)	(3.11)	(2.16)	(1.93)	(1.98)	(1.91)	(2.34)	(2.25)
bicameralism	0.3367	0.4576	4.6469	4.8005	5.4602	5.0012	5.3842	3.8428	4.6726
	(0.77)	(1.01)	(3.27)	(2.61)	(2.70)	(2.28)	(1.99)	(1.63)	(1.71)
pol2bic	-0.5151	-0.6847	-0.3901	-0.4182	-0.3947	-0.3794	-0.3434	-1.8870	-1.9837
	(0.61)	(0.79)	(0.49)	(0.47)	(0.40)	(0.38)	(0.31)	(1.37)	(1.31)
pol3bic	-1.1722	-1.4841	-1.6001	-1.5962	-1.4410	-1.4529	-1.6036	-1.6482	-1.7801
	(2.22)	(2.62)	(3.16)	(2.44)	(2.11)	(2.09)	(2.08)	(2.27)	(2.21)
fractionalisation			0.9968	0.7259	2.2524	2.2434	2.6648	2.1442	2.8045
			(0.88)	(0.51)	(1.21)	(1.19)	(1.19)	(1.04)	(1.15)
fracbic			-6.2670	-6.1626	-6.9067	-6.1803	-6.9662	-4.4181	-5.8956
			(3.03)	(2.26)	(2.27)	(1.86)	(1.66)	(1.24)	(1.39)
allhouse					0.5965	0.6365	0.5295	0.5785	0.5629
					(1.25)	(1.30)	(0.94)	(1.13)	(0.98)
govfractio					-0.1625	-0.1534	-0.1597	-0.2024	-0.2392
					(0.55)	(0.51)	(0.45)	(0.64)	(0.63)
Socio-Economic									
GNIpc	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(8.77)	(4.69)	(4.63)	(2.02)	(2.00)	(1.87)	(1.67)	(2.25)	(2.13)
lpop	0.0728	0.1202	0.0850	0.0868	-0.0057	0.0254	0.0231	0.0974	0.1073
	(0.51)	(0.72)	(0.57)	(0.51)	(0.03)	(0.13)	(0.11)	(0.48)	(0.47)
trade	0.0111	0.0116	0.0189	0.0177	0.0167	0.0145	0.0147	0.0124	0.0133
	(1.94)	(1.79)	(3.00)	(2.17)	(2.05)	(1.61)	(1.50)	(1.50)	(1.47)
freedom				-0.1531	-0.2350	-0.2064	-0.2091	-0.1056	-0.1303
				(0.98)	(1.43)	(1.19)	(1.07)	(0.59)	(0.67)
elf				0.1379	0.2181	-0.0482	-0.0257	-0.5036	-0.3419
				(0.18)	(0.23)	(0.05)	(0.02)	(0.43)	(0.25)
catho80				0.0029	0.0028	0.0055	0.0058	0.0089	0.0073
				(0.33)	(0.29)	(0.51)	(0.49)	(0.87)	(0.66)
prot80				0.0079	0.0058	0.0081	0.0148	0.0072	0.0108
				(0.90)	(0.66)	(0.83)	(0.95)	(0.79)	(0.74)
budd				0.5461	0.5680	0.7554	0.8123	0.6113	0.3927
				(0.69)	(0.72)	(0.87)	(0.74)	(0.73)	(0.37)
Muslim				-0.1312	0.0417	-0.0150	0.1263	-0.9203	-1.2446
				(0.16)	(0.05)	(0.02)	(0.12)	(0.84)	(0.86)
regional dummi	NO	YES	YES	YES	YES	YES	YES	YES	YES
Colonial									
ever colony	NO	NO	NO	NO	NO	YES	YES	NO	NO
colonial origin	NO	NO	NO	NO	NO	NO	NO	YES	YES
legal origin	NO	NO	NO	NO	NO	NO	YES	NO	YES
Const	0.098	-0.365	-0.936	-0.2322	0.3757	-0.2756	-1.2633	-1.9191	-3.1840
	(0.04)	(0.12)	(0.34)	(0.08)	(0.12)	(0.08)	(0.33)	(0.53)	(0.77)
Obs	43	43	43	43	43	43	43	43	43
R-squared	0.79	0.81	0.86	0.88	0.89	0.89	0.90	0.91	0.92

Notes: The detailed description of the variables and their sources are in the appendix. Absolute values of t-statistics in parentheses. The religious controls include four religions: Buddist, Catholic,Muslim and Protestant. The regional dummies refer to the following regions: OECD, Latin America, Middle East, Africa and Asia.

Table 6 – OLS regressions, dependent variable: corruption index

Controls	(1)	(2)	(3)	(4)	(5)
Political/Institutionals					
polarization=1	0.5819	0.7158	0.7624	0.7862	0.9339
	(0.89)	(1.07)	(1.24)	(1.13)	(1.03)
polarization=2	1.0098	1.1272	1.1286	1.1239	1.0609
	(2.71)	(2.78)	(3.11)	(2.16)	(1.93)
bicameralism	0.3367	0.4576	4.6469	4.8005	5.4602
	(0.77)	(1.01)	(3.27)	(2.61)	(2.70)
pol2bic	-0.5151	-0.6847	-0.3901	-0.4182	-0.3947
	(0.61)	(0.79)	(0.49)	(0.47)	(0.40)
pol3bic	-1.1722	-1.4841	-1.6001	-1.5962	-1.4410
	(2.22)	(2.62)	(3.16)	(2.44)	(2.11)
fractionalisation			0.9968	0.7259	2.2524
			(0.88)	(0.51)	(1.21)
fracbic			-6.2670	-6.1626	-6.9067
			(3.03)	(2.26)	(2.27)
allhouse					0.5965
					(1.25)
govfractio					-0.1625
					(0.55)
Socio-Economic					
GNIpc	0.0002	0.0001	0.0002	0.0001	0.0001
	(8.77)	(4.69)	(4.63)	(2.02)	(2.00)
lpop	0.0728	0.1202	0.0850	0.0868	-0.0057
	(0.51)	(0.72)	(0.57)	(0.51)	(0.03)
trade	0.0111	0.0116	0.0189	0.0177	0.0167
	(1.94)	(1.79)	(3.00)	(2.17)	(2.05)
latin		-0.3802	-0.3320	-0.5034	-0.6546
		(0.81)	(0.71)	(0.67)	(0.88)
asia		-0.5477	0.2583	0.0315	0.1865
		(0.80)	(0.38)	(0.03)	(0.20)
africa		0.6343	0.5004	0.2439	0.2282
		(1.19)	(1.01)	(0.41)	(0.38)
mid		-0.7597	-0.7019	-0.2891	-0.3317
		(1.20)	(1.19)	(0.37)	(0.40)

Notes: The detailed description of the variables and their sources are in the appendix. Absolute values of t-statistics in parentheses.

Table 6 (continues)- OLS regressions, dependent variable: corruption index

	(1)	(2)	(3)	(4)	(5)
freedom				-0.1531	-0.2350
				(0.98)	(1.43)
elf				0.1379	0.2181
				(0.18)	(0.23)
catho80				0.0029	0.0028
				(0.33)	(0.29)
prot80				0.0079	0.0058
				(0.90)	(0.66)
budd				0.5461	0.5680
				(0.69)	(0.72)
Muslim				-0.1312	0.0417
				(0.16)	(0.05)
Const	0.0987	-0.3651	-0.9365	-0.2322	0.3757
	(0.04)	(0.12)	(0.34)	(0.08)	(0.12)
Obs	43	43	43	43	43
R-squared	0.79	0.81	0.86	0.88	0.89

Notes: The detailed description of the variables and their sources are in the appendix. Absolute values of t-statistics in parentheses.

Table 7 – OLS regressions, dependent variable: corruption index

Controls	(6)	(7)	(8)	(9)
Political/Institutionals				
polarization=1	0.7890	0.8536	2.0280	2.2256
	(0.83)	(0.79)	(1.53)	(1.47)
polarization=2	1.1288	1.1726	1.4067	1.4626
	(1.98)	(1.91)	(2.34)	(2.25)
bicameralism	5.0012	5.3842	3.8428	4.6726
	(2.28)	(1.99)	(1.63)	(1.71)
pol2bic	-0.3794	-0.3434	-1.8870	-1.9837
	(0.38)	(0.31)	(1.37)	(1.31)
pol3bic	-1.4529	-1.6036	-1.6482	-1.7801
	(2.09)	(2.08)	(2.27)	(2.21)
fractionalisation	2.2434	2.6648	2.1442	2.8045
	(1.19)	(1.19)	(1.04)	(1.15)
fracbic	-6.1803	-6.9662	-4.4181	-5.8956
	(1.86)	(1.66)	(1.24)	(1.39)
allhouse	0.6365	0.5295	0.5785	0.5629
	(1.30)	(0.94)	(1.13)	(0.98)
govfractio	-0.1534	-0.1597	-0.2024	-0.2392
	(0.51)	(0.45)	(0.64)	(0.63)
Socio-Economic				
GNIpc	0.0001	0.0001	0.0001	0.0001
	(1.87)	(1.67)	(2.25)	(2.13)
lpop	0.0254	0.0231	0.0974	0.1073
	(0.13)	(0.11)	(0.48)	(0.47)
trade	0.0145	0.0147	0.0124	0.0133
	(1.61)	(1.50)	(1.50)	(1.47)
latin	-0.9884	-0.9840	-3.2062	-3.5415
	(1.05)	(0.97)	(2.00)	(1.98)
asia	0.0446	0.1953	0.2939	1.0236
	(0.05)	(0.14)	(0.28)	(0.72)
africa	0.1337	0.2589	-0.0141	0.0117
	(0.21)	(0.37)	(0.02)	(0.02)
mid	-0.2511	-0.3141	0.4056	0.5882
	(0.29)	(0.33)	(0.44)	(0.53)

Notes: The detailed description of the variables and their sources are in the appendix. Absolute values of t-statistics in parentheses.

Table 7 – (continues) - OLS regressions, dependent variable: corruption index

	(6)	(7)	(8)	(9)
freedom	-0.2064	-0.2091	-0.1056	-0.1303
	(1.19)	(1.07)	(0.59)	(0.67)
elf	-0.0482	-0.0257	-0.5036	-0.3419
	(0.05)	(0.02)	(0.43)	(0.25)
catho80	0.0055	0.0058	0.0089	0.0073
	(0.51)	(0.49)	(0.87)	(0.66)
prot80	0.0081	0.0148	0.0072	0.0108
	(0.83)	(0.95)	(0.79)	(0.74)
budd	0.7554	0.8123	0.6113	0.3927
	(0.87)	(0.74)	(0.73)	(0.37)
Muslim	-0.0150	0.1263	-0.9203	-1.2446
	(0.02)	(0.12)	(0.84)	(0.86)
Colonial				
ever colony	0.2791	0.2958		
	(0.60)	(0.58)		
colouk			0.7364	1.0022
			(1.29)	(1.17)
colofr			1.7717	2.1239
			(1.05)	(1.09)
coloesp			2.5729	2.9394
			(1.80)	(1.80)
legoruk		0.7208		0.2807
		(0.59)		(0.21)
legorfr		0.8071		0.8313
		(0.57)		(0.60)
legorge		0.9766		0.9415
		(0.78)		(0.77)
Const	-0.2756	-1.2633	-1.9191	-3.1840
	(0.08)	(0.33)	(0.53)	(0.77)
Obs	43	43	43	43
R-squared	0.89	0.90	0.91	0.92

Notes: The detailed description of the variables and their sources are in the appendix. Absolute values of t-statistics in parentheses.