

**Seminar Paper No. 726**  
**ENDOGENOUS CONSTITUTIONS**

by  
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INSTITUTE FOR INTERNATIONAL ECONOMIC STUDIES  
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# Endogenous Constitutions\*

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## Abstract

We present a theory of the choice of alternative democratic constitutions, a majoritarian or a consensual one, in an unequal society. A majoritarian democracy redistributes resources from the collectivity toward relatively few people, and has a relatively small government and low level of taxation. A consensual democracy redistributes resources toward a broader spectrum of social groups but also has a larger government and a higher level of taxation. A consensual system turns out to be preferred by the society when *ex ante* income inequality is relatively low, while a majoritarian system is chosen when income inequality is relatively high. Moreover, we obtain that consensual democracies should be expected to be ruled more often by center-left coalitions while the right should have an advantage in majoritarian constitutions. Finally, our model also provides a new rationale, based on the endogeneity of the political system, of the positive or absent (rather than

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negative) association between equality and redistribution transpiring from the cross-sectional evidence of developed countries presented in some recent studies. Some historical and empirical evidence supporting our results is provided.

Keywords: Endogenous Constitutions, Consensual Democracy, Majoritarian Democracy, Inequality, Heterogeneity, Redistribution.

JEL Classification Numbers: D31, D72, P16.

“...So long as redistribution can be achieved by steep income taxes on a very small minority then the majority principle lends itself to redistribution. But as the minority grows in size, the chances also increase that a majority coalition will be formed against further redistribution. Why should the great bulk of the voters in the middle ranges of the income distribution coalesce with the poor in favor of further redistribution rather than with the rich against further redistribution?”

(Robert Dahl, *Dilemmas of Pluralist Democracy*, ch. 6).

“...Suppose, on the other hand, that substantially all of the merchants, money lenders, security holders, manufactures, shippers, capitalists and financiers and their professional associates are to be found on one side in support of the Constitution and that substantially all or the major portion of the opposition came from non-slaveholding farmers and the debtors - would it not be pretty conclusively demonstrated that our fundamental law was not the product of an abstraction known as “the whole people”, but of a group of economic interests which must have expected beneficial results from its adoption? Obviously all the facts here desired cannot be discovered, but the data presented in the following chapters bear out the latter hypothesis, and thus a reasonable presumption in favor of the theory is created.”

(Charles A. Beard, *An Economic Interpretation of the Constitution of the United States*, ch. 1).

## 1 Introduction

Democracy is defined as the “government of the people.” As Arend Lijphart stresses (e.g. Lijphart, 1999), however, this expression can be understood in two fundamentally different senses, which correspond to the two kinds of democratic political regimes actually observed around the world. “The people” can be taken to mean “the majority of the people” or, alternatively, “as many people as possible.” The first sense corresponds, in Lijphart’s terminology, to the model of *majoritarian* democracy (or *Westminster* model) and the second sense to the model of *consensual* democracy.

Majoritarian and consensual democracies do differ in variety of institutional dimensions. Among them, three are of particular importance. First of

all, majoritarian democracies are characterized by a majoritarian (“plurality rule” or “first-past-the-post”) electoral system whereas consensual democracies by a proportional one. Second, in terms of the executive-legislative relations, the majoritarian model is characterized by the dominance of the former, and the consensual model by a balance between the two powers. Finally, whereas in majoritarian democracy the executive power is typically concentrated in one-party, bare-majority cabinets, in consensual democracy it is much more spread, and governments are normally the expression of a coalition of different parties.

Among developed countries, the U.K. and other Commonwealth countries including Australia, Canada and New Zealand, are typical examples of majoritarian democracies. The U.S. are also in many ways (though not in all) an example of a majoritarian democracy. The consensual model of democracy is best represented by some Scandinavian and Northern European countries but many important institutional elements of this model are also shared by several other countries of Continental Europe.

The role of key constitutional provisions in shaping fiscal policy outcomes in representative democracies has been emphasized widely in the political economics literature. Important examples include an earlier contribution of Myerson (1993), as well as the more recent ones of Persson, Roland and Tabellini (1997, 2000), Persson and Tabellini (2000a), Austen-Smith (2000), Lizzeri and Persico (2001) and Milesi-Ferretti, Perotti and Rostagno (2002). All these papers study the effects of constitutional provisions on some fiscal policy outcomes. All of them are, however, based on the premise of taking political institutions as given.

In this paper we attempt instead to provide an economic theory of the choice of a democratic constitution on the base of one primitive fundamental: the (pre-tax) distribution of income within a society. Our main result is that majoritarian constitutions are more likely to be chosen by a society when the degree of pre-tax income inequality is relatively high. To the contrary, consensual democracy is more likely to arise in relatively homogeneous societies.<sup>1</sup>

We present a simple public finance model where fiscal policy is about

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<sup>1</sup>The focus on the distribution of income is motivated by the insights provided by the positive political economics theory of taxation and redistribution in democracies (e.g. Meltzer and Richard, 1981), which stresses the importance of this variable in shaping fiscal policy outcomes when individual preferences are aggregated directly by majority voting. In our model, the distribution of income affects fiscal policy for a given constitution, but also in a completely novel way, namely by influencing the process of social choice among different political institutions, which will have different first-order effects on policy itself.

the provision of some public goods, financed with proportional taxation of income. The public goods considered are local, or group-specific, in the sense that each of them is desired by one and only one of the three social groups (or “classes”) which compose the society and that are identified by their level of pre-tax income: the poor, the middle class and the rich. We go on by characterizing the political equilibrium of the model in a majoritarian and in a consensual democracy respectively. A key assumption that we maintain in each constitutional environment is that politicians are citizen-candidates who have a direct interest in the policy implemented and cannot credibly commit to implement any policy different from their preferred one.

We assume that fiscal policy in a majoritarian democracy is decided by a “leader” elected directly by the people through a majority voting process among the menu of citizen-candidates participating to the election. We demonstrate that in equilibrium the winner is always a rich citizen-candidate because the rich enjoy a natural advantage over the other two classes, which arises from their relative fiscal conservatism. Given that the winner is always a rich, it is clear that the structure of majoritarian democracy biases policy outcomes in favor of this group.

In a consensual democracy fiscal policy is decided by a coalition government formed as the outcome of some legislative bargaining process among the members of a parliament elected with a proportional electoral law. We show that the government coalition depends on the distribution of income. According to our model, in a consensual democracy a middle class and rich (middle class and poor), or center-right (center-left), government coalition is more likely to be formed when the distribution of income is more (less) polarized. We show that taxation and the size of government in a consensual democracy under a center-left coalition is higher than under a center-right one. Moreover, taxation and the size of government are generally higher in a consensual than in a majoritarian democracy.

Finally, we evaluate from the point of view of the different groups of citizens the welfare implications of the two types of political institutions, and we let individuals vote in an “original position” in absence of any veil of ignorance on which constitution to adopt. We obtain that a society with high income inequality prefers a majoritarian constitution while consensual democracy is preferred when inequality is lower.

We go on to discuss some historical evidence supporting our claim that the key constitutional principles should be interpreted from an economic perspective, namely as reflecting the interests of particular social groups or classes as opposed to the “public good.” For example, we provide evidence that the constitution of the U.S. has been drafted to reflect essentially the

interests of the economic elite of the time and something similar happened in the U.K.. We also show that, consistently with the predictions of our model, consensual constitutions have been chosen by Scandinavian, Northern and Continental European countries when income inequality in these societies was relatively low and the political voice of the masses was loud.

The model provides not only an explanation to the factors that affect the choice of a democratic constitution, but it also has some other important general implications. A first result is that, in agreement with the existing theoretical and empirical literature, taxation and overall size of government in consensual democracies are higher than in majoritarian ones.<sup>2</sup> However, in our model this result is generated by the *selection bias* in the *composition of the government coalition* and not, as in the existing literature, by the fact that the proportional representation leads to the formation of government coalitions with many parties, which in turn spend more because they need to please broader and more diverse constituencies than single-party executives. In particular, consensual democracies should be expected to be ruled more often by center-left coalitions representing lower income groups, while the right should have an advantage in majoritarian constitutions. We present empirical evidence that points exactly in this direction. First, center-left government coalitions are indeed observed more often in proportional systems and right-wing executives in majoritarian democracies. Second, left-wing executives tend to tax and spend more than right-wing ones.

Our model shed also some light on the relationship between inequality and redistribution. It is well known that the models based on the median voter theorem predict that a higher pre-tax income inequality should lead to more redistribution. However, the empirical literature has shown that among industrial democracies, the more unequal countries tend to redistribute less (rather than more). In our model, income inequality not only affects fiscal policy (in a nonlinear way) for a given constitution but it also influences the choice of the constitution itself. The result is that the relationship between income inequality and redistribution may well be absent or positive.

Our paper is related to a recent literature that investigates, from different perspectives, the endogenous choice of some institutional norms. For example, Aghion and Bolton (2003) deal with the normative issue of the choice of an optimal majority rule in an incomplete contracting framework. Aghion, Alesina and Trebbi (2002) analyze the optimal degree of “insulation” of

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<sup>2</sup>In agreement with the literature we also obtain that in consensual democracies more public goods and larger and more universalistic welfare programs are provided.



policy-makers. Other contributions along these lines include Barbera and Jackson (2001) and Messner and Polborn (2002).

The paper is organized as follows. Section 2 describes the basic economic setting and the public finance problem we focus on. Sections 3 and 4 deal with the political equilibrium of the model in majoritarian and consensual constitution respectively. Section 5 characterizes the properties of the political equilibrium within and across constitutions in terms of public finance outcomes. Section 6 deals with the key issue of the endogeneity of the constitution and its relation with the distribution of income. Some extensions of our baseline model are discussed in Section 7. Section 8 presents some pieces of historical evidence supporting our theory. Section 9 contains some empirical evidence on the fiscal policy outcomes of majoritarian and consensual democracies and discusses the relationship between income inequality and redistribution from the perspective of our model. Section 10 concludes.

## 2 A Simple Model of Public Finance: Basic Setup

We consider a simple model of “local” (that is, group specific) public goods provision based on Persson and Tabellini (2000a, ch. 7). A society is made up by  $N > 1$  groups of individuals. For convenience, we focus on the case where  $N = 3$ . Group  $j \in \mathfrak{S} \equiv \{p, b, r\}$  has size (measure)  $m^j$  and each individual of that group has an exogenous pre-tax income equal to  $y^j$ . Total population is made by a continuum of unitary measure  $\sum_{j \in \mathfrak{S}} m^j = 1$  and with no loss of generality we assume that  $\max\{m^p, m^r\} < m^b < \frac{1}{2}$ , that  $m^i + m^l > \frac{1}{2}$ ,  $\forall (i, l) \subset \wp(\mathfrak{S})$ , the set of all subsets of  $\mathfrak{S}$ , and that  $y^p < y^b < y^r$ . This means that group  $b$  is the largest one and has an intermediate level of income, so that it is natural to identify it with the “middle class.” Group  $p$  and group  $r$  correspond vice-versa to the “poor” and to the “rich” people. The absolute majority (or plurality) of votes is reached by the combination of any pair of groups. Notice also that the above assumptions are sufficient to ensure that the voter with median income (i.e. the median voter if preferences are single-crossing in income) belongs to group  $b$ . Finally, we assume that  $y^b < \bar{y} \equiv \sum_{j \in \mathfrak{S}} m^j y^j$ : the voter with median income is poorer than the (virtual) mean voter, which means that the distribution of income is skewed to the left consistently with the evidence on the shape of the empirical distribution of income.

We assume that the utility function of each member of group  $j$  has the following quasi-linear form

$$w^j = c^j + H(g^j) \tag{1}$$

where  $c^j$  indicates the consumption of a private good and  $g^j$  the level of the type  $j$  public good provided.  $H(\cdot)$  is a smooth, increasing and concave function and satisfies the Inada conditions.<sup>3</sup> We also assume that  $H(0) = 0$ . The Inada conditions guarantee that at the optimum each group will always strictly prefer to have some taxation and some provision of its desired public good to the alternative of no taxation and no public good. All the above properties are satisfied by the constant elasticity functional form  $H(g^j) = A(g^j)^\alpha$ , where  $A$  is a constant and  $\alpha \in (0, 1)$ . At some point we will use such preference specification to obtain some analytical and numerical results.<sup>4</sup>

Each group is perfectly homogeneous. Heterogeneity is only between groups and is related to the differences in the pre-tax income level and to group-specific preferences on the public good to be provided. The specification of preferences in equation (1) implies that each group values one particular public good only (that is, it gets no utility from the provision of any other public good) and there are as many kinds of public goods as the groups of people. One could think to them as pure Samuelsonian (non rival and non excludable) public goods or as publicly provided private goods, like education, health and housing. The first interpretation corresponds somehow to the extreme case of the existence of three pure public goods, on which the different groups of individuals have different preferences. The second interpretation may capture the fact that a significant part of government expenditure is about the provision of private goods and that different income groups may have very different preferences on them.<sup>5</sup> For example, Besley and Coate (1991) show that, allowing for different quality levels of the public goods, a *de jure* universal provision scheme does not imply that it is *de facto* universal and explain why some publicly provided private goods like health care may go to the advantage of the poor and not to the rich. Fernandez and Rogerson (1995) discuss the case of higher education and emphasize how the public provision of it can benefit higher-income individuals

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<sup>3</sup>This means that  $H_g(\cdot) > 0$ ,  $H_{gg}(\cdot) < 0$  and  $\lim_{g^j \rightarrow 0} H_g(g^j) = \infty$ .

<sup>4</sup>The quasi-linearity assumption simplifies the analysis but it is not essential. As it will be clear later, what is essential is a preferences specification generating a negative association between the income level and the desired tax rate.

<sup>5</sup>In our formulation the public good's per capita consumption of the group does not depend on the size of the group and this might not be always the case if we refer to the provision of private goods. However, one might think that the provision of such goods implies primarily a fixed cost and a low (at the extreme zero) variable cost.

at the expense of the poor.<sup>6</sup> However, the important feature of our redistribution scheme is the possibility of targeting the benefit of the redistribution toward specific social groups.

Income is taxed at a proportional rate  $\tau \in [0, 1]$  that will be determined later as a part of the political equilibrium of the model. Therefore, the budget constraint of the agents of group  $j$  is simply

$$c^j = (1 - \tau) y^j. \quad (2)$$

We assume that the government can finance public expenditures only out of the revenues generated by income taxation. In equilibrium  $g^j$  is positive only when group  $j$  is part of the government. If we incorporate this result in the public sector budget constraint, the latter can be rewritten as

$$\sum_{j \in \Omega} g^j \leq \tau \sum_{j \in \mathfrak{S}} m^j y^j = \tau \bar{y} \quad (3)$$

where  $\Omega \equiv \{j \in \mathfrak{S} : j \text{ is part of the government}\} \subseteq \wp(\mathfrak{S})$ .

In the next two sections we derive and characterize the political equilibrium of our model, namely the tax rate  $\tau$ , the overall level of public expenditure and its composition  $G \equiv (g^p, g^b, g^r)$ , in the case of both a majoritarian constitution and a consensual one. Since the constitution is at this stage still taken as given, these equilibria can be considered as partial political equilibria. Then, we characterize the general political equilibrium where the constitution will be itself endogenous and chosen by the society.

We assume that *voting* is *sincere* in any constitutional environment<sup>7</sup> and model the political process going on within a majoritarian or a consensual democracy drawing on the citizen-candidate apparatus of Osborne

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<sup>6</sup>In other words, the specification of preferences in equation (1) could also be interpreted as a reduced form of a more general model where some form of group-specific heterogeneity in preferences regarding the provisions of different public goods arises as an equilibrium outcome, rather than by assumption, as it does in our model. A similar specification of preferences is assumed in the model of political economy of budget deficits of Alesina and Tabellini (1990) where individuals care about two public goods with different intensity. Our specification corresponds essentially to the extreme case where each group cares of only one public good (specific to that group). The innovative assumption that we make is that individual preferences on public goods are (perfectly) correlated with the individual income level, so that each public good is identified with one social class and vice versa.

<sup>7</sup>The assumption of sincerity in the individual voting behavior can be justified in game-theoretic terms by noticing that each individual regards himself as an atomistic subject and therefore considers his vote irrelevant in conditioning the outcome of the elections.

and Slivinsky (1996) and Besley and Coate (1997).<sup>8</sup> We adopt a model of endogenous political candidacy since we want to emphasize the link existing between individual preferences (of citizens as well as of politicians) and individual income. Moreover, a key advantage of this model is to allow for the existence of an equilibrium even when individual preferences fail to be single-peaked, and when therefore there may not be an equilibrium under simple majority voting with exogenous candidates. This is a potentially serious problem in our model since the policy space, namely the set  $\{(\tau, G) \in [0, 1] \times \mathbb{R}_+^3 : \sum_{j \in \Omega} g^j \leq \tau \bar{y}\}$ , is not unidimensional and it is well known that political equilibria based on simple majority voting may fail to exist when the social choice process has a multidimensional object. The citizen-candidate model allows us to avoid the problem of non-existence of an equilibrium. At the same time, we are able to show that the main drawback of it, namely the generic multiplicity of political equilibria, is not an issue in our economy.

### 3 Majoritarian Democracy

We assume that in a majoritarian democracy fiscal policy is decided by a “leader” elected directly by the people through a majority voting process among the menu of citizen-candidates participating to the election. With this assumption, we mean to capture essentially two related features of majoritarian democracy (see on this Lijphart, 1999, ch. 7). These are the “winner-takes-all” nature of the electoral law and the dominance of the executive over the legislative power.<sup>9</sup> To do so, we focus on the limit case where the existence of the latter as a separate institutional body is ignored. Alternatively, we could have assumed the existence of a parliament whose members are elected in single-candidate districts. If the distribution of agents across districts is roughly the same as the overall distribution then the outcome would be the same as the one of the framework we are using here.

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<sup>8</sup> Osborne and Slivinsky (1996) assume sincere voting while in Besley and Coate (1997) individuals are strategic. In this sense our model is closer to the first one.

<sup>9</sup> Our characterization of majoritarian democracy may appear as too stylized if referred to the American political system, of which it misses a feature as important as the possibility of observing a “divided government” (e.g. Alesina and Rosenthal, 1995, 1996), judicial review and more generally the whole system of checks and balances contemplated by the constitution. A similar assumption is made in a recent contribution of Austen-Smith (2000). However, in our view, the main results of the paper should be essentially independent from this omission.

The menu of candidates is endogenous and one individual runs for office if and only if, in equilibrium, the net gain of doing so (the difference between the utility he gets if does-not run) exceeds the exogenous cost of running. The winner of the election is the candidate gaining the plurality of votes and he alone decides on fiscal policy. Voting takes place only once.

To characterize the political equilibrium under a majoritarian constitution, it is useful to start from the benchmark case of the unconstrained preferred policy of each social group. Then, suppose that a member of group  $j$  (which one is irrelevant given the assumption of perfect within group homogeneity) could act as a dictator and implement his preferred policy (“dictatorial policy”). It is clear that he would not spend anything in any public good other than his preferred one, so that  $g^i = 0$ ,  $i \neq j$  and  $g^j = \tau \bar{y}$ . Hence, his optimization problem reads

$$\max_{\{\tau\}} w^j = (1 - \tau) y^j + H(\tau \bar{y}).$$

The first order condition is

$$y^j = H_g(\tau \bar{y}) \bar{y} \tag{4}$$

and

$$\tau^j = \frac{H_g^{-1}(y^j/\bar{y})}{\bar{y}} \tag{5}$$

is the (unique) optimal dictatorial tax rate of group  $j$ .<sup>10</sup> It is straightforward to verify that  $\frac{\partial \tau^j}{\partial y^j} < 0$ : the richer is a group  $j$  member (for a given mean level of income), the higher is the marginal cost of public good provision he faces and the lower is his demand for his preferred public good. Hence, the dictatorial tax rates for the three groups can be ordered as

$$\tau^r < \tau^b < \tau^p. \tag{6}$$

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<sup>10</sup>It is immediate to verify that the second order condition is satisfied. The Inada conditions imposed on  $H(\cdot)$  imply that the tax rate is always strictly positive but a tax rate strictly lower than one cannot be excluded. Finally, notice that this level of taxation also maximizes the utility of group  $j$  as a whole.

No commitment technology is assumed to be available, and therefore candidates cannot announce credibly before the election to pursue, if elected, any policy different from their preferred one. This means that in a majoritarian democracy the menu of possible policies is included in the set  $\{(\tau^j, G^j)\}_{j \in \mathfrak{S}} \subset \{[0, 1] \times \mathfrak{R}_+^3 \times \Omega\}$ , where  $\tau^j$  is defined as in (5),  $G^j = (e^j)g^j$ ,  $e^j$  indicating the  $j^{\text{th}}$  element of the canonical base spanning  $\mathfrak{R}_+^3$ , and  $g^j = \tau^j \bar{y}$ .

Let  $k$  indicate some private benefit of being in office, which is either a psychological benefit or a non-taxed monetary income, and  $\varepsilon$  be the cost of running. Both are exogenous and equal for everybody with  $k \geq \varepsilon$ . Now, we can state the main result of this Section, which is contained in Proposition 1.

**Proposition 1.** *The model has a unique political equilibrium with the following features. Only rich citizen-candidates run for office and each of them is elected with probability  $\varepsilon/k$ . Rich people are indifferent between running and not running. Only the public good preferred by the rich is provided and the tax rate  $\tau$  is set at the level defined by equation (5) for  $y^j = y^r$ .*

**Proof.** See Appendix. ■

Notice that four elements of the model are important for the results of Proposition 1. First, no one group has the majority of the votes alone. Second, the utility function is chosen in such a way that the rich, as dictator, is the group that prefers the lowest taxes. Third, the winner-takes-all nature of the electoral process: in two-candidate contests between the rich and another group, the rich always win since they prefer less taxation.<sup>11</sup> Fourth, if a group expects to lose an election, no candidate is forthcoming.

Two other features of the majoritarian democracy outcome are interesting. One refers to the size of the government which is relatively small since fiscal policy is decided by the most fiscally conservative group. The other concerns the election's outcome which involves a departure from the standard Downsian convergence to the median result (Downs, 1957). Indeed, in

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<sup>11</sup>This implies that, *off-equilibrium*, it is possible to observe an “extreme coalition” made up by the rich and the poor. As it is clear from the proof of Proposition 1, in case there are two candidates, a rich and a middle class agent, the poor prefer to vote for the rich since the latter's fiscal conservatism is the best alternative they have. Extreme coalition equilibria are not uncommon in the political economy literature. For instance, they have been found to arise in other models of public provision of private goods, such as Epplé and Romano (1996a,b).

our model of majoritarian democracy the rich exercise their leadership no matter how many they are, that is even if they are the smallest social group. In this case the majoritarian democracy would imply a sort of “dictatorship of the absolute minority”, as opposed to the one of the median voter. In our framework, this bias in favor of the rich in the process of collective decision making arise directly, i.e. regardless to other factors, such as a low electoral turn-out rate among poor, low human capital individuals or the presence of credit constraints in a lobbying model.

## 4 Consensual Democracy

In a consensual democracy voters do not elect a leader directly but rather elect their representatives to the parliament. We assume the existence of a parliament composed by a continuum of measure  $\rho \in (0, 1)$  of members which are elected with a pure proportional electoral rule in a single nation-wide electoral district. The government is formed as the outcome of a process of legislative bargaining among the representatives of the different groups and it expresses a certain parliamentary majority. This reflects the different balance of powers between the executive and the legislative, which distinguishes consensual from majoritarian democracy.<sup>12</sup> We assume that the plurality of parliamentary votes is sufficient to form a government. This assumption does not correspond to the pure ideal of consensual democracy, which requires that (at least some) collective decisions are backed by a unanimous agreement or, equivalently, that the minority is entitled to exercise a binding veto right on the decisions of the majority. In our model instead we interpret the principle of power sharing which is at the root of consensual democracy in a more restricted sense by comparing the government of one elected with a majoritarian electoral law (majoritarian constitution) to the government of the majority of a parliament elected with a proportional electoral law (consensual democracy).

The policy formation process corresponds to the following three-stages game.

1. The entry of candidates stage.
2. The voting stage.
3. The legislative bargaining stage.

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<sup>12</sup>The classical reference on legislative bargaining in parliamentary democracies is the paper of Austen-Smith and Banks (1988), on which we draw in the modelling of the bargaining game. Austen-Smith and Banks in turn draw on the agenda setting model proposed by Romer and Rosenthal (1978, 1979).

Assuming that there are three groups in the parliament and that no group has the absolute majority of parliamentary members (which will be the case in equilibrium), events take place at the legislative bargaining stage according to the following protocol.

- *Round 1 of the bargaining game:* the head of the representatives (appointed at random) of the group having the relative majority of seats in the parliament is called to make a policy proposal to the head of the representatives of one other group of his choice. Given that “buying” votes is costly, only two groups coalitions will be observed and a version of Riker’s minimum size coalition principle will apply.
- If the proposal is accepted, the government coalition is formed and the agreed policy is implemented.
- *Round 2 of the bargaining game:* if the proposal is not approved, a second agenda setter is appointed randomly by nature between the representatives of the two groups of which no member was agenda setter at round 1. More precisely, a member of either of these groups is appointed as agenda setter at round 2 with probability equal to the share of the parliamentary seats of his group, relative to the total number of seats of the two groups. Then, the second agenda setter has the opportunity to form a government (just as the first one) and formulates a coalition proposal to one other group of his choice.
- If no proposal is approved at round 2, the game ends and the *status quo* policy is implemented. We assume that the *status quo* policy corresponds to no taxation and no public goods provision.

Notice that our modelling of the policy making process in a consensual democracy is innovative in at least two dimensions. First, we study a legislative bargaining process between citizen-candidates representatives. Second, we analyze how the distribution of income shapes fiscal policy outcomes through the non-standard channel of the bargaining power of the different classes, which is endogenous and turns out to depend on the income distribution itself.

#### 4.1 Entry of Candidates and Voting

The equilibrium of the policy formation game must be sequentially rational, which means that the Nash equilibrium at each stage of the game must rationally anticipate its subsequent equilibrium path.



The assumption of sincere voting and the citizen-candidate structure imply that each individual will vote for a candidate from his own social group, if available, whatever the equilibrium at the legislative bargaining stage will be. Indeed, since the policy preferences of the citizen-candidates from the group  $j$  coincide with those of the members of that group, then voting for the best policy alternative (that is, voting sincerely) is equivalent for the members of group  $j$  to voting for the citizen-candidates from  $j$ . Given that individuals are atomistic and that the parliament is made by a large number of them, the policy outcome and therefore the gross-of-office-benefit utility of a citizen-candidate does not depend on whether he actually does or does not run for office. Therefore, a citizen-candidate of group  $j$  runs for office if and only if

$$\{p [w^j(\tau, G) + k] + (1 - p) w^j(\tau, G)\} - w^j(\tau, G) = pk \geq \varepsilon$$

where  $(\tau, G)$  is the equilibrium policy resulting from the legislative bargaining game to be played and  $p$  is the probability of being elected. Free entry of candidates implies that in equilibrium the above weak inequality holds as an equality, which means that the probability that a member of group  $j$  is elected is  $p = \frac{\varepsilon}{k} \in (0, 1]$ ,  $\forall j \in \mathfrak{S}$ .<sup>13</sup> This fact and the proportionality of the electoral law imply that group  $j$  elects  $\rho m^j$  representatives, and the set of candidates of group  $j$  running for office has measure  $\lambda^j = \frac{\rho m^j}{p} = \frac{k}{\varepsilon} \rho m^j$ .

## 4.2 The Legislative Bargaining Stage

The above analysis has shown that the parliament is a mirror-image of society in the sense that the distribution of seats across the three groups exactly reflects the distribution of the population across these groups. This in turn means that the agenda setter at round 1 is a representative of the middle-class, which (being the largest class) has the largest number of seats in the parliament. Moreover, if the middle class fails to form a government, the second agenda setter is appointed randomly by nature and chosen between the representatives of the poor and the rich. By assumption, the probability that a poor (rich) will be the agenda setter at the second round (conditional of the game reaching it) is equal to the share of the seats of the poor (rich) of the combined number of seats of the poor and of the rich. Hence,

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<sup>13</sup>Or, in other words,  $k/\varepsilon$  represents the number of citizens from each group that compete for each seat that the group wins. It is clear that in equilibrium all members of group  $j$  will be indifferent between running and not running as free entry of candidates drives down to zero the net benefit of running for office.

$$\phi = \frac{\rho m^p}{\rho m^p + \rho m^r} = \frac{m^p}{m^p + m^r} \quad (7)$$

is the probability that a poor is appointed as agenda setter at round 2. Conversely, the probability that the agenda setter at the second round is a rich is equal to the complementary probability  $(1 - \phi)$ .

It is clear that  $\phi$  can be interpreted as an index of the bargaining power of the poor: the higher is the number of the poor  $m^p$ , the higher is  $\phi$ , the higher is the probability that the poor are agenda setter at the second round, the higher is their expected utility at that stage of the game, and therefore the higher will be the public good that the middle class agenda setter (at round 1) provides them for any given level of taxation so to accept her government coalition proposal. Moreover, as we will show later,  $\phi$  is also a measure of income inequality: other things equal, a higher  $\phi$  corresponds to a more unequal income distribution.<sup>14</sup>

The legislative bargaining game has a unique (subgame-perfect) Nash equilibrium. The first agenda setter (from the middle class) formulates a coalition formation proposal based on a fiscal policy program to one other group only, given that no more than that is needed to reach a parliamentary majority. The coalition formation offer leaves the group receiving it indifferent between accepting and rejecting it, namely gives to the recipient a level of utility equal to its outside option and the offer is accepted. Therefore, the question we need to answer is: which group (among the poor and the rich) is the cheapest to buy? To answer this question, we first solve our bargaining game by backward induction starting from the second round.

We indicate the group of the agenda setter with  $h$ , the other group part of the government with  $l$  and the stage of the game with  $s$ . Therefore,  $\tau_{s,h,l}$  is the tax rate proposed to group  $l$  by the agenda setter  $h$  at round  $s$  of the game. The correspondent level of public good received by the group  $i$  will be  $g_{s,h,l}^i$ . Similarly, the level of utility of the group  $i$  is  $w_{s,h,l}^i$ .

#### 4.2.1 Round 2 of the Bargaining Game

The following Lemma is a first step in the understanding of which vote among the poor and the rich is the cheapest to buy at round 1.

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<sup>14</sup>Finally notice that the probability  $\phi \in (0, 1)$  because  $m^p$  and  $m^r$  are always positive. However, in the analysis presented below we also consider the limit cases where  $\phi = 0$  and  $\phi = 1$  because they allows us to define the tax rates and utilities in the all range  $[0, 1]$ .

**Lemma 1.** *At round 2 of the bargaining game, the poor are always part of the government coalition; the middle class is so only if the agenda setter is a poor and the rich only if the agenda setter is a rich.*

**Proof.** At round 2, the outside option of each group is its *status quo* utility, namely its gross income. Since the agenda setter optimizes giving to the coalition partner what is strictly necessary to induce it to accept the policy proposed, the policy menu  $(\tau_{2,h,l}; g_{s,h,l}^l)$  offered from the agenda setter  $h$  to group  $l$  satisfies the condition

$$(1 - \tau_{2,h,l}) y^l + H(g_{2,h,l}^l) = y^l. \quad (8)$$

Consider the schedule  $g_{2,h,l}^l \equiv g_{2,h,l}^l(\tau_{2,h,l}, y^l)$  defined implicitly by equation (8). Holding constant  $\tau_{2,h,l}$ , this schedule is such that

$$\frac{\partial g_{2,h,l}^l}{\partial y^l} = \frac{\tau_{2,h,l}}{H_g(g_{2,h,l}^l)} > 0.$$

This means that the richer is a group, the more it has to be compensated in terms of public good provision for any level of taxation. Thus, if the rich is appointed agenda setter at the second round, he will always prefer the poor to the middle class as coalition partner. Alternatively, if the second round agenda setter is poor, the middle class will be cheaper to buy than the rich. Finally, the assumptions on the protocol of the legislative bargaining game imply that the middle class is never the agenda setter at round 2. ■

Therefore, if *at round 2 the agenda setter is a rich*, then by Lemma 1 the poor will be the coalition partner and their participation constraint is

$$(1 - \tau_{2,r,p}) y^p + H(g_{2,r,p}^p) = y^p \quad (9)$$

which means that  $g_{2,r,p}^p = H^{-1}(\tau_{2,r,p} y^p)$ . The equilibrium government budget constraint can be written as<sup>15</sup>

$$\tau_{2,r,p} \bar{y} = g_{2,r,p}^p + g_{2,r,p}^r \quad (10)$$

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<sup>15</sup>We are using the fact that in equilibrium the public good preferred by the group not part of the government coalition will not be provided.

and the optimal tax rate for the rich solves the following maximization problem

$$\max_{\{\tau_{2,r,p}\}} w_{2,r,p}^r = (1 - \tau_{2,r,p}) y^r + H(g_{2,r,p}^r) \quad (11)$$

subject to the constraints (9) and (10). The optimality conditions are derived in the Appendix.

If *at round 2 the agenda setter is a poor*, then the coalition partner will be the middle class whose participation constraint can be written as

$$(1 - \tau_{2,p,b}) y^b + H(g_{2,p,b}^b) = y^b \quad (12)$$

which means that  $g_{2,p,b}^b = H^{-1}(\tau_{2,p,b} y^b)$ . Substituting the equilibrium government budget constraint in the utility function of the poor, the optimal tax rate for the poor solves the maximization problem

$$\max_{\{\tau_{2,p,b}\}} w_{2,p,b}^p = (1 - \tau_{2,p,b}) y^p + H(\tau_{2,p,b} \bar{y} - g_{2,p,b}^b) \quad (13)$$

subject to the participation constraint of the middle class (12). Again, the optimality conditions can be found in the Appendix.

#### 4.2.2 Round 1 of the Bargaining Game

While the poor are always part of the government coalition if the game reaches round 2 (an off-equilibrium event), this does not need be the case at round 1. Indeed, at this stage of the game the middle class agenda setter will form the government coalition with the group that allows her to reach the highest level of utility from the implemented policy. This policy will be such to leave the group receiving the offer just indifferent between accepting it and going to the second round.<sup>16</sup> As we will see, the expected utility of each group at round 2 depends positively on its probability of being agenda setter at that stage. Hence, the higher is the probability  $\phi$  of the poor of being agenda setter at round 2, the higher is their expected utility at this stage of the game, the more costly is for the middle class to buy their vote at

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<sup>16</sup>This implies that the participation constraint always hold with the equality sign when it is binding.

round 1, and therefore the less likely is that they are part of the government coalition. In what follows, we will establish a global result which identifies the winning coalition in terms of a critical value of  $\phi$ . To proceed in this direction, we first define the maximization problems of the middle class under the two possible coalitions.

If the government coalition is made up by the *middle class and the rich*, then the participation constraint of the rich at round 1 is

$$(1 - \tau_{1,b,r}) y^r + H(g_{1,b,r}^r) \geq (1 - \phi) [(1 - \tau_{2,r,p}) y^r + H(g_{2,r,p}^r)] + \phi (1 - \tau_{2,p,b}) y^r. \quad (14)$$

The left hand side of (14) represents the utility of the rich if the middle class' policy proposal at round 1 is implemented, while the right hand side is their expected utility conditional on the game reaching round 2.<sup>17</sup>

Substituting the equilibrium form of the government budget constraint in the utility function of the middle class, the maximization problem becomes

$$\max_{\{\tau_{1,b,r}\}} w_{1,b,r}^b = (1 - \tau_{1,b,r}) y^b + H(\tau_{1,b,r} \bar{y} - g_{1,b,r}^r) \quad (15)$$

subject to the participation constraint of the rich (14). This constraint may not be always binding however. This is the case when the dictatorial policy of the middle class gives to the rich a higher utility than their expected utility at round 2.<sup>18</sup> In this situation the consensual democracy equilibrium is equivalent to the dictatorship of the middle class which obtains the maximum level of utility by implementing her unconstrained preferred policy. From an inspection of (14) it is immediate to verify that this is always the case whenever, as  $\phi$  approaches one, the middle class dictatorial tax rate  $\tau^b$  is lower than  $\tau_{2,p,b}$ .

It is possible to prove analytically that  $\tau^b < \tau_{2,p,b}$ , and therefore that the participation constraint of the rich is not binding, if the income of the

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<sup>17</sup>In other words, for the rich to be convinced to accept the proposal of the middle class agenda setter they must be given a level of utility at least equal to the expected utility they get if the game reaches the second round.

<sup>18</sup>As we already know, the dictatorial policy of the middle class means setting a tax rate equal to  $\tau^b$  (as defined by (5) with  $y^j = y^b$ ) and spending all the government revenues in her preferred public good:  $g_{1,b,r}^b = \tau^b \bar{y}$  and  $g_{1,b,r}^r = 0$ .

poor  $y^p$  is equal to zero and  $\phi$  is equal to one.<sup>19</sup> Indeed, in this case the taxation decided by the poor agenda setter and the middle class coalition at the second round  $\tau_{2,p,b}$  is defined by the following equation

$$\frac{y^b}{H_g(\tau_{2,p,b}y^b)} = \bar{y}. \quad (16)$$

By comparing this expression with the dictatorial tax rate of the middle class

$$\frac{y^b}{H_g(\tau^b\bar{y})} = \bar{y}$$

it turns out that  $\tau_{2,p,b}y^b = \tau^b\bar{y}$ , which implies that  $\tau_{2,p,b} > \tau^b$  given that  $y^b < \bar{y}$ . Our numerical simulations (that we discuss in the next Section) show that the constraint of the rich may not be binding as  $\phi$  approaches to one also when the income of the poor is different from zero. Some examples are provided by the numerical simulations whose results are shown in Figures 4-9.<sup>20</sup>

When the participation constraint of the rich is binding, the first order condition relative to the maximization problem (15) is

$$y^b = H_g(\tau_{1,b,r}\bar{y} - g_{1,b,r}^r) \left( \bar{y} - \frac{y^r}{H_g(g_{1,b,r}^r)} \right) \quad (17)$$

and this equation allows us to obtain  $\tau_{1,b,r}$  and  $g_{1,b,r}^r$  if combined with equation (14).<sup>21</sup> Then,  $g_{1,b,r}^b$  is obtained from the government budget constraint.

If the coalition government is made up by the *middle class and the poor*, then the participation constraint of the poor at round 1 is

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<sup>19</sup>We remind to the reader that  $\phi = 1$  is not a possible probability because  $m^r$  is always positive. However, the above result is a useful benchmark and in general it will also hold for values of  $\phi$  sufficiently close to one.

<sup>20</sup>Clearly, the lower is the income of the poor and the higher will be  $\tau_{2,p,b}$ . This in turn makes more likely the fact that the participation constraint of the rich is not binding. A clear example is provided by the simulation in Figure 9.

<sup>21</sup>In this case the constraint (14) holds with equality sign because the agenda setter proposes to the rich a policy that leaves them indifferent between accepting and rejecting it.

$$(1 - \tau_{1,b,p})y^p + H(g_{1,b,p}^p) \geq (1 - \phi)y^p + \phi \left[ (1 - \tau_{2,p,b})y^p + H(g_{2,p,b}^p) \right]. \quad (18)$$

The left hand side of (18) is the utility of the poor at round 1 if the middle class' policy proposal is implemented, while the right hand side corresponds to their expected utility if the game reaches the second round. This participation constraint is always binding (if  $y^p > 0$ ) because the poor are always part of the government coalition at round 2 and this implies that their expected utility at this stage (the right hand side of (18)) will be at least equal to their level of income, i.e. what they get if the *status quo* policy is implemented. Therefore, for any level of  $\tau_{1,b,p}$  the poor have to be compensated with a strictly positive amount of their specific public good  $g_{1,b,p}^p$ , which in turn means that (18) always binds.<sup>22</sup>

The substitution of the equilibrium government budget constraint in the utility function of the middle class implies that their maximization problem can be written as

$$\max_{\{\tau_{1,b,p}\}} w_{1,b,p}^b = (1 - \tau_{1,b,p})y^b + H(\tau_{1,b,p}\bar{y} - g_{1,b,p}^p) \quad (19)$$

subject to the participation constraint of the poor (18). The first order condition of this problem reads

$$y^b = H_g(\tau_{1,b,p}\bar{y} - g_{1,b,p}^p) \left( \bar{y} - \frac{y^p}{H_g(g_{1,b,p}^p)} \right). \quad (20)$$

From (20) and (18) we obtain  $\tau_{1,b,p}$  and  $g_{1,b,p}^p$ , while  $g_{1,b,p}^b$  is derived from the government budget constraint.

The next Proposition characterizes the outcome of the coalition formation process at the first round of the legislative bargaining game.

**Proposition 2.** *There exists a threshold value of  $\phi$ ,  $\phi^* \in (0, 1)$  such that*

*(i) if  $\phi < \phi^*$ , the government coalition is made by the middle class and by the poor;*

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<sup>22</sup>Again, given that the middle class policy proposal is such to leave the poor just indifferent between accepting and rejecting it, (18) always holds with the equality sign.

(ii) if  $\phi > \phi^*$ , the government coalition is made by the middle class and by the rich.

**Proof.** See Appendix. ■

The intuition for this result is straightforward. When  $\phi$  is relatively low ( $\phi < \phi^*$ ), the probability that the poor are agenda setter at round 2 is also so, and so is their expected utility at the second round. This means that their vote is relatively cheap to buy at round 1. On the other hand, when  $\phi$  is relatively small,  $1 - \phi$  is relatively high, and so is the probability of the rich of being agenda setter at round 2, which in turn implies that their expected utility at the second round is high and their vote is costly to buy at round 1. Therefore, there exists a level of  $\phi$  sufficiently small that the middle class prefers to make a government coalition with poor because their vote is cheaper to buy (than that of the rich). Clearly, the opposite is true when  $\phi$  is relatively high ( $\phi > \phi^*$ ). At the threshold  $\phi^*$ , the middle class is just indifferent between forming a coalition with the rich or with the poor.

The result in Proposition 2 can be regarded as an application of the general principle by which, in coalition formation games, it can be in fact advantageous to be in a relatively weak bargaining position as that increases the likelihood of becoming a member of the coalition. This is much to the contrary of what happens in a Nash bargaining process, where a lower bargaining power only reduces the share of the surplus of which one can appropriate.

## 5 The Size of Government Across Constitutions and Coalitions

While the tax rate chosen under a majoritarian constitution is only a function of the income of the rich (relative to the average one), the tax rate in a consensual democracy under the two possible coalitions is a function of the income distribution, i.e. of both the incomes of the classes ( $y^p, y^b, \bar{y}, y^r$ ) and the value of  $\phi$ . A comparison of these tax rates is not straightforward due to the strong non-linearity present in the first order conditions defining them. However, by making some assumptions on the levels of income of the classes and the utility function of the individuals we can state the results presented and discussed below. First, we assume a power function specification for the utility derived from the public good:  $H(g^j) = A(g^j)^\alpha$ , with  $\alpha \in (0, 1)$  and  $A > 0$ .

**Result 1.** *If the income of the poor is equal to zero and the income of*



*the rich is sufficiently high relative to the average income, then the level of taxation and public expenditure (and the size of government) obtaining in a consensual democracy under a government coalition made by the middle class and the poor is always higher than that obtaining under a middle class and rich coalition, which in turn is higher than the taxation and public expenditure obtaining in a majoritarian democracy. In other words, for all values of  $\phi$  the following inequalities hold:  $\tau^r < \tau_{1,b,r} < \tau_{1,b,p}$ .*

**Proof.** See Appendix. ■

A graphical representation of the tax rates correspondent to Result 1 is provided by Figure 1. The two assumptions on the income of the poor and the rich are sufficient conditions which guarantee that Result 1 holds and can be proved analytically. However, our numerical simulations show that these conditions are not necessary. Nevertheless, these assumptions provide an insight on the characteristics of the income distribution that lead to that result. In particular, the result that  $\tau^r < \tau_{1,b,r} < \tau_{1,b,p}$  for all  $\phi$  is easy to obtain when the income of the poor  $y^p$  and the income of the rich  $y^r$  are respectively low and high with respect to the average income  $\bar{y}$  or, in other words, when there is enough dispersion in the income of the three classes.

From the numerical analysis we have obtained two interesting results. First, a level of  $y^r$  sufficiently high relative to  $\bar{y}$  is enough to obtain the taxation ranking of Result 1 ( $\tau^r < \tau_{1,b,r} < \tau_{1,b,p}$ ) even when  $y^p$  and  $y^b$  are both very close to  $\bar{y}$ . Second, with an extremely equal income distribution, taxation in majoritarian democracy is always higher than taxation in consensual democracy (regardless of the ruling coalition). An example with these results can be found in the numerical simulation correspondent to Figure 2.<sup>23</sup> In this simulation we have used two parameterizations for the income of the three classes. The first parameterization is:  $y^p = 0.9$ ,  $y^b = 0.95$ ,  $\bar{y} = 1$ ,  $y^r = 1.1$ . In the second one we have changed the income of the rich only and used  $y^r = 4$  (the schedules indicated with “new” refers to this case).

The first parameterization corresponds to a very equal society given that the income of the poor is only 10% lower than the average income while the income of the rich is only 10% higher than the mean.<sup>24</sup> Figure 2 shows that in this case the tax rate set in consensual democracy is lower than the tax rate set in majoritarian democracy. The increase in the income of the rich

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<sup>23</sup>In the numerical simulations we have used the power function specification for  $H(\cdot)$  with  $A = 1$  and  $\alpha = 0.5$ .

<sup>24</sup>In this case the variation in the size of the classes, and therefore of  $\phi$ , cannot change the fact that the distribution is very equal even when there many poor ( $\phi$  high).

from 1.1 to 4 leads to a reduction in the tax rate obtaining in majoritarian democracy and the tax rate of the middle class and rich coalition up to the point that the tax rates ranking of Result 1 generally holds.<sup>25</sup> The explanation for this result is the following.

The fiscal policy of a single group government should involve, other things equal (i.e. if all groups have a similar income as it is in the first parameterization), a higher tax rate and total expenditure than the policy of a two groups government coalition regardless of how the tax revenues are divided among the public goods provided. Indeed, recall that a public good is provided only if the group which likes it is part of the government coalition and the optimal tax rate of a group is such that the marginal cost of taxation equals the marginal benefit from the public good provision. While the marginal cost of taxation is independent on the number of public goods that are financed with the tax revenues (i.e. the number of groups in the government coalition), the marginal benefit from that increase in taxation decreases with the number of public goods among which this increase in taxation is split. This implies that the tax rate should decrease with the number of groups in the government coalition, which in turn implies that, other things equal, the tax rate in majoritarian democracy should be higher than tax rate in consensual democracy.

However, we now need to explain why Result 1 and most numerical simulations lead to the opposite result, namely that generally the tax rate in consensual democracy is higher than the tax rate in majoritarian democracy. This result is due to the fact that in majoritarian democracy fiscal policy is decided by the group with the highest level of income (the rich), while in consensual democracy fiscal policy is chosen by a government coalition representing two groups with an average level of income lower than the income of the rich. Similarly, the middle class and poor coalition taxes and spends more than the middle class and rich one exactly because it contains a group (the poor) with lower income.<sup>26</sup> If the incomes of the three classes are sufficiently spread, then the latter effect more than compensate the effect (described above) generated by the number of groups in the government leading to the taxation ranking of Result 1 ( $\tau^r < \tau_{1,b,r} < \tau_{1,b,p}$ ).

There are also other features of the relationship between the tax rates across constitutions for different income distributions that deserve to be

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<sup>25</sup>Notice that the tax rate of the middle class and poor coalition is not affected by the income of the rich  $y^r$ .

<sup>26</sup>To be more precise, the fiscal policy in consensual democracy is chosen by the middle class with the constraint of giving a certain utility to the rich or the poor such that they accept the offer.

more deeply analyzed. Our numerical simulations have shown that taxation in majoritarian democracy is lower than taxation under the middle class and poor coalition even if the dispersion in the income levels of the three classes is very small.<sup>27</sup> A slightly higher spread in this distribution is necessary if we want the tax rate of the middle class and rich coalition to be higher than the level of taxation in majoritarian democracy for all  $\phi > \phi^*$ . As it will be clear in the next Section, we are particularly interested in the case where  $\tau^r < \tau_{1,b,r}$  when  $\phi > \phi^*$ . Figure 3 shows a numerical simulation suggesting that this result holds if there is a minimum degree of dispersion in the income levels of the three groups. Indeed, using the previous parametrization ( $y^p = 0.9$ ,  $y^b = 0.95$ ,  $\bar{y} = 1$ ) and increasing the income of the rich to 1.6 is enough to have  $\tau^r < \tau_{1,b,r}$  for all  $\phi > \phi^*$ .<sup>28</sup>

Finally, we want to discuss how the tax rates across constitutions and coalitions and the value of  $\phi^*$  change as the incomes of the three classes vary. An increase in the income of the rich always leads to a lower tax rate in majoritarian democracy while the tax rate under the middle class and poor coalition is not affected by a variation in  $y^r$ . For certain parameterizations, the tax rate under the middle class and poor coalition generally decreases for all  $\phi \in (0, 1)$  as in Figure 2 and 3, but for other parameterizations  $\tau_{1,b,r}$  decreases for low values of  $\phi$  and increases when  $\phi$  is sufficiently high. An example is provided by the simulation whose results are shown in Figure 4 and 5. From this simulation and the others of Figure 2 and 3 we can verify that an increase in  $y^r$  always reduces  $\phi^*$ .

The effects of a reduction in the income of the middle class are reported in Figures 6 and 7. A decrease in  $y^b$  lowers the utility of the middle class under both coalitions and therefore  $\phi^*$  can both increase or decrease. In the example presented here  $\phi^*$  does not change. As expected, the reduction in the income of the middle class increases taxation in consensual democracy under both coalitions, while taxation in majoritarian democracy is obviously not affected by a variation of  $y^b$ .

A lower income of the poor increases the utility of the middle class under both coalitions and the sign of the variation of  $\phi^*$  cannot be uniquely determined. Similarly to a reduction in  $y^b$ , a lower income of the poor increases taxation in consensual democracy under both coalitions. An example is reported in Figures 8 and 9.

For all results discussed in this Section, we have run many other numer-

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<sup>27</sup>For example, with the above parameterization ( $y^p = 0.9$ ,  $y^b = 0.95$ ,  $\bar{y} = 1$ ) an income level of the rich higher than 1.3 is enough to obtain  $\tau^r < \tau_{1,b,p}$  for all  $\phi \in (0, 1)$ .

<sup>28</sup>It is immediate from Figure 3 that a further increase in  $y^r$  implies that  $\tau^r < \tau_{1,b,r}$  also for some values of  $\phi < \phi^*$ .

ical simulations which confirm the robustness of the results presented.

## 6 Income Inequality and Constitutional Choice

Having characterized the political equilibrium of the model under the two possible institutional arrangements, we now turn to the question of which of them would be chosen *ex ante* by society, when the constitution is endogenous. We assume that the process of constitutional choice takes place in an original position where individuals know their class-status and preferences and before any other politico-economic interaction. We also assume that the decision is taken by simple majority voting, and that the available alternatives are the two constitutional regimes we have considered. Given that there is *no veil of ignorance* and uncertainty, individuals correctly anticipate what their level of utility would be under the two possible constitutions, and vote consequently. Finally, we assume that there is a minimum degree of dispersion in the income levels of the three groups so that the tax rates ranking of Result 1 holds, or at least that the tax rate set under the middle class and rich coalition is higher than the tax rate under majoritarian democracy when  $\phi > \phi^*$ .

**Proposition 3.** *If  $\phi < \phi^*$  society chooses consensual democracy while it prefers majoritarian democracy when  $\phi > \phi^*$ .*

**Proof.** It is clear that for the rich and the middle class the constitutional choice has a trivial, albeit opposite, solution. Since majoritarian democracy expresses the dictatorship of the rich, they will prefer it unconditionally. Similarly, given that the middle class has the relative majority of votes, which allows her to be the first agenda setter in the legislative bargaining game, she will prefer unconditionally the consensual constitution.<sup>29</sup> The most interesting decision is the one of the poor, who turn out to be the swing voters. The poor do gain from the higher political inclusion which is typical of consensual democracy, only if they are part of the government coalition as partner of the middle class agenda setter. In this case they are clearly better-off than they are in a majoritarian setting.<sup>30</sup> However, we

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<sup>29</sup>It is trivial to deduce that the middle class is always better-off in a consensual democracy than in a majoritarian one. Indeed, notice that in consensual democracy the middle class would always have the option of replicating the majoritarian outcome by offering to the rich of forming a coalition and implementing their own preferred policy.

<sup>30</sup>Again, it is immediate to verify that if the poor are part of the government coalition they get a level of utility which is at least as high as their pre-tax income level, while in

know that this needs not to be always the case, since the ruling coalition does not include them whenever  $\phi \in (\phi^*, 1)$ . In this instance the poor are actually worse-off in a consensual democracy: they do pay higher taxes (see the discussion in the previous Section) but get as well no provision at all of their specific public good. Therefore, if  $\phi \in (0, \phi^*)$  the majority prefers consensual democracy while majoritarian democracy is chosen when  $\phi \in (\phi^*, 1)$ . ■

We now focus the attention on constitutional changes generated by different mean preserving spreads of the pre-tax distribution of income. We present two mean preserving spread to the distribution of income which show that an increase in income inequality makes more likely the adoption of a majoritarian democracy instead than a consensual one.

### Mean Preserving Spread 1.

We first consider a transformation of the income distribution that affects the size of the three classes. We suppose that  $m^p$  and  $m^r$  increase and that  $m^b$  decreases in such a way that both the size of the population and the average level of income  $\bar{y}$  remain constant. Then, society has a smaller middle class, more rich and more poor; that is, it is more unequal.

Observe that, whilst the threshold  $\phi^*$  is not affected by this transformation, the value of  $\phi$  necessarily increases, as we show below. Therefore, it becomes more likely that  $\phi$  belongs to the interval  $(\phi^*, 1)$  and that a majoritarian democracy is chosen.

We now show that the mean preserving spread considered implies that  $\phi$  necessarily increases. To this end, let us consider the definition of the average income

$$\bar{y} = m^p y^p + m^b y^b + m^r y^r$$

and divide both sides by  $(1 - m^b) = (m^p + m^r)$  taking into account the definition of  $\phi$  in (7); we have that

$$\frac{\bar{y}}{1 - m^b} = \phi y^p + \frac{m^b}{1 - m^b} y^b + (1 - \phi) y^r.$$

Rearranging terms we get that

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majoritarian democracy they always get a lower level of utility because of positive taxation and no provision of their preferred public good.

$$y^r - \phi(y^r - y^p) = \bar{y} + \frac{m^b}{1 - m^b}(\bar{y} - y^b). \quad (21)$$

A decrease in  $m^b$  implies a reduction in the right hand side of (21) as  $\bar{y} > y^b$ . Therefore,  $\phi$  must increase given that  $y^r > y^p$ , which means that  $\phi$  can also be interpreted as a measure of income inequality. Again, our model predicts that when income inequality is relatively low ( $\phi < \phi^*$ ) society prefers a consensual democracy, while it chooses a majoritarian system when income inequality is relatively high ( $\phi > \phi^*$ ).

### Mean Preserving Spread 2.

Another mean preserving spread we consider is generated by a transformation of both the size of the classes and the income of the rich. In particular, we analyze the effect on constitutional choice of an increase in inequality caused by the increase in the income of the rich, accompanied by an equi-proportional increase in the number of the rich and of the poor (and a reduction of the middle class) so that both  $\phi$  and  $\bar{y}$  are unaffected.

Given that  $\phi$  remains constant, we need to determine how  $\phi^*$  changes so to understand which constitution is more likely to be chosen by the society. To this end we need to find out how the two schedules representing the utility of the middle class under the two possible coalitions vary as  $y^r$  increases. First, observe that the utility of the middle class in the coalition with the poor  $w_{1,b,p}^b$  does not depend on the income of the rich  $y^r$  and therefore it is not affected by any variation of it.<sup>31</sup> The utility of the middle class in the government coalition with rich  $w_{1,b,r}^b$  is instead a function of  $y^r$ . We are not able to show analytically how this schedule changes with the income of the rich<sup>32</sup> but the numerical simulations (see for example those correspondent to Figure 2, 3, 4 and 5) point out that it shifts upward (i.e.  $w_{1,b,r}^b$  increases) as  $y^r$  goes up leading to a reduction in  $\phi^*$ .<sup>33</sup> This means that this increase in income inequality leads to a reduction of the range  $(0, \phi^*)$  where the consensual democracy is chosen, and therefore that it makes more likely the

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<sup>31</sup>See the maximization problem in (19) with the participation constraint of the poor (18).

<sup>32</sup>It is possible to obtain a sufficient condition for  $w_{1,b,r}^b$  to be increasing in  $y^r$ , which in turn means that  $\phi^*$  is decreasing in  $y^r$ . This point is analyzed in the Appendix.

<sup>33</sup>More precisely, it is possible to observe for certain parameterizations that  $w_{1,b,r}^b$  shifts upward for almost all  $\phi$  except for values of  $\phi$  very close to one where it shift down. However, this is always irrelevant because this happens for values of  $\phi$  very far from  $\phi^*$ .

adoption of a majoritarian constitution.<sup>34</sup>

Even though our model is a purely static one, and therefore any dynamical consideration relative to it should be viewed as a speculation, we think that it is interesting to remark the fact that the model contains forces that make it dynamically stable in the sense we now explain. If income inequality is relatively high, society should choose a majoritarian constitution. The fiscal policy in this constitutional system should favor the rich and therefore not reduce the initial degree of income inequality. Conversely, if income inequality is relatively low, society will prefer a consensual constitution, under which fiscal policy should generally reflect the preferences of the middle class and poor. If we suppose that these groups prefer public goods like health and education, whose provision should have a negative effect on future income inequality, we also obtain that a consensual constitution generates a relatively equal distribution of income.

## 7 Extensions

In this Section we present two main extensions of our framework. The first concerns the introduction of a general public good.<sup>35</sup> The second consists in the introduction of a deterministic legislative bargaining process in consensual democracy. Both extensions confirm the robustness of the results of the baseline version of the model. Finally, we briefly discuss the relationship between other kinds of heterogeneity and constitutional choice.

### 7.1 General and Specific Public Goods

We assume that individuals have *intermediate* preferences over a group-specific public good  $g^j$  and a general public good  $q$ . The preferences of each individual of group  $j$  can be represented by the following utility function

$$w^j = c^j + \theta H(g^j) + (1 - \theta)F(q)$$

where  $F(q)$  is the utility derived from the general public good and  $\theta \in [0, 1]$  is a parameter indexing the relative importance of the two public goods. When

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<sup>34</sup>This particular mean preserving spread corresponds to the shocks driving, according to our theory, the cases of constitutional change in France, Germany and Italy that we discuss in Section 8.

<sup>35</sup>We also provide a very brief discussion on other two possible extensions that lead to results similar to the introduction of a general public good.

$\theta$  is high then the individuals give more importance to the consumption of the group specific public good relative to the general one, and vice versa when  $\theta$  is low. For simplicity and without loss of generality, we assume that the utility functions of the public goods are power functions:  $H(g^j) = (g^j)^\alpha$ ,  $F(q) = q^\alpha$ , with  $\alpha \in (0, 1)$ .

We first analyze the equilibrium under a majoritarian constitution and a consensual one for different values of  $\theta$ , and then we characterize the general political equilibrium.

In majoritarian democracy, only middle class citizen-candidates run for office if  $\theta \in [0, \theta^*]$  and only rich citizen-candidates run for office when  $\theta \in [\theta^*, 1]$ .<sup>36</sup> Therefore, the winner is a member of the middle class in the first case and a rich in the second instance. This result confirms that the political equilibrium under a majoritarian constitution leads to the dictatorship of the rich even when the policy space is enlarged to include the provision of a general public good, as long as this public good is not too important for individuals. The result comes from the fact that the poor prefer the dictatorial policy of the middle class when the taste for the general public good is relatively high ( $\theta \leq \theta^*$ ), while they prefer the dictatorial policy of the rich when the taste for this good is sufficiently low ( $\theta \geq \theta^*$ ). Indeed, the dictatorial policy of the middle class implies a higher tax rate than that of the rich and a higher provision of both the general and the group-specific public good. A high value of  $\theta$  means that the winner (middle class or rich) spends a large fraction of the government revenues in her group specific public good and only a small amount of resources in the general public good, which is the only one that goes also to the advantage of the poor. If  $\theta$  is higher than a certain threshold  $\theta^*$ , the disutility generated by the higher taxes that the poor pay when the winner is a middle class member (instead than a rich one) is not compensated by the higher provision of the general public good. The opposite is true when the taste for the general public good is sufficiently strong ( $\theta \leq \theta^*$ ).

The partial political equilibrium in consensual democracy is the same as that of the baseline version of the model. In other words, for any given  $\theta$ , there exists a threshold value  $\phi^* \in (0, 1)$  such that the government coalition is made by the middle class and the poor if  $\phi < \phi^*$ , while it is made by the middle class and the rich when  $\phi > \phi^*$ .<sup>37</sup> However, in this case we are unable to determine analytically the exact tax rate and composition of the public expenditure for all values of  $\theta$ , and this makes more difficult the

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<sup>36</sup>The proof of this result can be found in the Appendix.

<sup>37</sup>The proof is provided in the Appendix.



characterization of the general political equilibrium. Nevertheless, notice the following.

Similarly to the baseline model, when  $\theta \in [\theta^*, 1]$  the rich always prefer the majoritarian democracy because they can implement their unconstrained preferred policy, while the middle class members prefer the consensual constitution because they are always part of the government coalition. Therefore, the poor are again the swing voters. If the poor are part of the government coalition ( $\phi < \phi^*$ ) in consensual democracy, they will prefer this constitutional framework. If they are not part of the government coalition ( $\phi > \phi^*$ ) they should prefer the majoritarian democracy.<sup>38</sup> This means that the equilibrium of the extended model converges to that of the baseline framework when  $\theta$  is sufficiently close to one, i.e. if the taste of individuals for the specific public good relative to the general one is sufficiently high.

When the taste for the specific public good is low enough, i.e. when  $\theta \in [0, \theta^*]$ , the results of our baseline framework do not hold anymore and the society should always chooses the majoritarian constitution.<sup>39</sup>

## 7.2 Cash Transfers and Specific Public Goods

An alternative framework we could consider is the one where the policy space is enlarged to include the provision of a uniform cash-transfer along the group-specific public goods. A possible framework for such a kind of analysis could be the following.

Assume that  $a \geq 0$  is the lump-sum uniform cash-transfer (potentially) provided by the government. The post-tax and transfer income of a member of group  $j$  (which is equal to the consumption of the private good) is now

$$c^j = (1 - \tau)y^j + a$$

and therefore his utility function can be written as

$$w^j = (1 - \tau)y^j + a + \chi H(g^j)$$

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<sup>38</sup>In principle, we cannot exclude the possibility that the policy of the middle class and rich coalition gives to the poor a higher utility than the policy in majoritarian democracy when  $\phi$  is (greater but) not too far from  $\phi^*$ . However, we can claim that there always exists a  $\phi^* \leq \bar{\phi} < 1$  such that the utility of the poor when  $\phi > \bar{\phi}$  is higher in majoritarian democracy. Clearly, this does not change substantially our results. A deeper characterization of the general political equilibrium is provided in the Appendix.

<sup>39</sup>Again, this point is analyzed in the Appendix.

where  $\chi \geq 0$  is a parameter measuring the intensity of the taste for the specific public good.<sup>40</sup>

To make sure that the tax rate is different from one when the income of the group deciding the fiscal policy is lower than the average income, it is useful to assume that taxation involves some deadweight distortions.<sup>41</sup> Formally, if income is taxed at rate  $\tau$ , the actual revenues are  $T = [\tau - \psi(\tau)] \bar{y}$ , where  $\psi(\cdot)$  is a smooth, strictly increasing and strictly convex function. Hence, the government budget constraint is

$$a + \sum_{j \in \Omega} g^j \leq [\tau - \psi(\tau)] \bar{y}$$

where  $\Omega \equiv \{j \in \mathfrak{S} : j \text{ is part of the government}\} \subseteq \wp(\mathfrak{S})$ .

We do not present here the results of this extension because they are very similar to the introduction of the general public good. If the taste for the specific public good  $\chi$  is sufficiently high then the results of the baseline model still hold. This is not the case when the individuals derive low utility from the specific public good (similarly to what happens in the framework with the general public good). On the other hand, notice that (except from the different form of the marginal utility) the general public good and the cash transfer have a very similar characteristic: they are forms of redistribution that make closer the optimal fiscal policy of the poor to that of the middle class, namely the two social groups with income below average.

### 7.3 Taste for others' public goods

Another possible extension is the one where the members of a group derive utility also from the public goods preferred by the others but with a lower intensity. The utility function of a member of group  $j$  could be the following

$$w^j = (1 - \tau)y^j + H(g^j) + \sum_{i \neq j} b_i H(g^i)$$

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<sup>40</sup>The introduction of the parameter  $\chi$  is useful because to have an interesting problem we need that the configuration of the parameters of the model is such that the non-negativity constraint on  $a$  is not binding for the middle class and for the poor. In this case we get that both forms of redistribution can coexist.

<sup>41</sup>This assumption was not necessary before because redistribution did not involve the transfer of monetary income.

with  $b_i < 1$ . Since the general political equilibrium analysis would be very complicated in such framework, we have decided to consider the special case where the poor like the public good of the middle class only.

Again, the result is the same as the one obtained in the presence of the general public good. In other words, the key parameter is the one representing the taste of the poor for the public good of the middle class. If this is low, then the results of our baseline model still hold. Indeed, the poor prefer the rich to the middle class in majoritarian democracy because the utility derived from the public good of the middle class is not compensated by the higher taxation. Therefore, the winner is a rich in majoritarian democracy. The equilibrium in consensual democracy is such that there exists a threshold value of  $\phi^* \in (0, 1)$  such that the middle class makes the government coalition with the poor if  $\phi < \phi^*$  and with the rich when  $\phi > \phi^*$ . The general political equilibrium result is such that the poor are again the swing voters. They will prefer the consensual democracy when they are part of the government coalition and the majoritarian system when the middle class makes the coalition with the rich.

If the poor have a high taste for the public good of the middle class, then the middle class is the winner in majoritarian democracy and in general equilibrium society will generally choose this constitutional system.

#### 7.4 Deterministic Agenda Setter

In the legislative bargaining game of consensual democracy we have assumed that the agenda setter is chosen with a deterministic rule at the first round and randomly at round 2. These protocol assumptions are new in the literature, where usually two main frameworks are used for the allocation of the agenda setting rights. One is the assumption of a deterministic rule and the other of a pure random one. We have chosen an intermediate scheme for two reasons. The first is to have a framework richer than the deterministic agenda setter but not as complicated as the random one. The second is because we wanted to capture the fact that in practice a clear bias typically exists in favor of the relative majority party, in terms of the allocation of agenda setting rights, that go well beyond the relative share of the votes of such a party. In this Section we show that our main results hold even when the selection rule for the agenda setter is deterministic.

Then, we now analyze what happens if the legislative bargaining game of consensual democracy has a deterministic rule also for the agenda setter at round 2. In other words, we assume that the agenda setter at that stage of

the game is the second largest group.<sup>42</sup> Afterwards, we will consider the case where the legislative bargaining game has three stages (instead than two) before that the *status quo* policy is (eventually) implemented so that all groups can potentially be agenda setter. As we will see, also this extension does not change our main results.

We continue the analysis in terms of the parameter  $\phi$  that in this case represents only a characteristic of the income distribution (the degree of inequality), and not also the probability that the poor are agenda setter at round 2 (as was instead in the baseline model). Assume first that there are more rich than poor,  $m^r > m^p$  (and then  $0 < \phi < 0.5$ ), so that the rich are agenda setter at round 2.<sup>43</sup> At this stage of the game we know that the rich optimally choose the poor as coalition partner because they are cheaper to buy than the middle class (see Lemma 1). The middle class agenda setter finds optimal to make the government coalition with the poor at round 1.<sup>44</sup> If the income of the poor is equal to zero, their participation constraint is not binding and the dictatorial policy of the middle class is implemented:  $w_{1,b,p}^b = w^b$  and  $\tau_{1,b,p} = \tau^b$ . If the income of the poor  $y^p$  is positive then both  $w_{1,b,p}^b$  and  $\tau_{1,b,p}$  are lower than the correspondent values of the dictatorial policy. In particular, under the assumption that  $H(\cdot)$  is a power function, it is possible to show analytically that  $\tau_{1,b,p}$  is decreasing in  $y^p$ .<sup>45</sup> Moreover, the numerical simulations show that generally  $\tau_{1,b,p} > \tau^r$  provided that there exists at least a very small degree of dispersion in the incomes of the three classes or the income of the rich is high enough. Whatever the income of the poor, the fiscal policy proposed by the middle class to them at round 1 is such that the utility of the poor is (at least) equal to their income level  $y^p$ , given that this is what they get if the game reaches round 2.

If the middle class makes the government coalition with the rich (which

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<sup>42</sup>Again, we assume that the *status quo* policy corresponds to no taxation and no public goods provision.

<sup>43</sup>We remind that in the baseline model we have also analyzed the case where the probability of the poor (and consequently of the rich) of being agenda setter at round 2 was equal to zero ( $\phi = 0$ ) or one ( $\phi = 1$ ). We have considered these two extreme probabilities (even though we knew in that framework there was no admissible income distribution with such characteristics) because they were useful endpoints for the characterization of the tax rates across constitutions and coalitions. That analysis turns out to be useful also here because the probability of the poor (or rich) of being agenda setter at round 2 is always zero or one. It is immediate to see that when  $m^r > m^p$  we have to look to the analysis developed in the baseline model with  $\phi = 0$ , i.e. to the case where the probability of the poor of being agenda setter at round 2 was equal to zero.

<sup>44</sup>See the proof of Proposition 2 when  $\phi = 0$ .

<sup>45</sup>The proof is straightforward and available from the authors upon request.

is clearly not the optimal solution in this case), the equilibrium policy turns out to be the dictatorial policy of the rich when the income of the poor is equal to zero.<sup>46</sup> This means that  $w_{1,b,r}^b < y^b$  and  $\tau_{1,b,r} = \tau^r$ . When  $y^p$  is positive the numerical simulations suggest that  $\tau_{1,b,r} \leq \tau^r$ .<sup>47</sup> Clearly, it remains true that  $w_{1,b,r}^b < y^b$ .

We now consider the case where there are more poor than rich,  $m^r < m^p$  (and then  $0.5 < \phi < 1$ ). This means that the poor are agenda setter at round 2 and they prefer to make the government coalition with the middle class if the game reaches that stage. Hence, it can be shown (see the proof of Proposition 2 when  $\phi = 1$ ) that the middle class prefers to make the government coalition with the rich at round 1. The analytical characterization of the fiscal policy of this coalition is possible under the assumption that  $y^p = 0$ . In this case, the participation constraint of the rich is not binding and the middle class dictatorial policy is implemented:  $w_{1,b,r}^b = w^b$  and  $\tau_{1,b,r} = \tau^b$ .<sup>48</sup> When  $y^p > 0$ , it is immediate to verify that  $w_{1,b,r}^b < w^b$  and the numerical simulations show unambiguously that  $\tau_{1,b,r} \leq \tau^b$  because  $\tau_{1,b,r}$  decreases as the income of the poor increases (see for example Figure 9 at  $\phi = 1$ ).<sup>49</sup> The utility of the poor under the middle class and rich coalition is lower than their income level  $y^p$  because they pay taxes and do not get any amount of their preferred public good (similarly to what happen in majoritarian democracy). Assuming that there is a minimum degree of dispersion in the income of the three classes (which we always assume to be case), then  $\tau_{1,b,r} > \tau^r$ , and this implies that the utility of the poor in majoritarian democracy is higher than their utility in consensual democracy under the middle class and rich coalition.

If the middle class makes the government coalition with the poor (which is never optimal in this case), then the utility of the middle class is equal to their level of income ( $w_{1,b,p}^b = y^b$ ). We can show analytically that  $\tau_{1,b,p} > \tau^b$

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<sup>46</sup> Again, see the proof of Proposition 2 when  $\phi = 0$ .

<sup>47</sup> More precisely,  $\tau_{1,b,r}$  is equal to  $\tau^r$  when the income of the rich is sufficiently high or there is enough dispersion in the income of the three classes. If this is not the case, then it is possible that  $\tau_{1,b,r} < \tau^r$ .

<sup>48</sup> We remind we have previously shown that the participation constraint of the rich is not binding when the poor have a probability one to be agenda setter at round 2 and their income is equal to zero.

<sup>49</sup> The numerical simulations highlight two important characteristics of  $\tau_{1,b,r}$  when the poor are agenda setter at round 2 with probability one. The first is that the participation constraint of the rich is not binding, i.e.  $\tau_{1,b,r} = \tau^b$ , when  $y^r$  is sufficiently high or there is a certain degree of dispersion in the income of the three classes. Second, that even a very small degree of dispersion in the incomes of the three classes is enough to guarantee that  $\tau_{1,b,r} > \tau^r$ .

if  $y^p = 0$ .<sup>50</sup> The numerical simulations suggest that  $\tau_{1,b,p}$  is generally greater than  $\tau^r$  whenever there is even a very small degree of dispersion in the income of the three classes.

Figures 10 and 11 provide a graphical representation of the utility of the middle class and the equilibrium tax rates as a function of  $\phi$  across coalitions when the income of the poor is equal to zero. From the above analysis it is clear that the results are not substantially different from a qualitative point of view when the income of the poor is strictly positive.

Proposition 2 holds also with a completely deterministic agenda setting scheme. Clearly, the value of  $\phi^*$  is always equal to 0.5 in this framework. In other words, the middle class prefers the poor as coalition partner when  $m^r > m^p$  (i.e.  $\phi < 0.5$ ) because the rich are agenda setter at round 2 and are more costly to buy than the poor, and chooses the rich whenever  $m^r < m^p$  (i.e.  $\phi > 0.5$ ) given that the poor are agenda setter at the second round and they are more costly than the rich.

Hence Proposition 3, that characterizes the constitutional choice of the society, applies also in this case (with  $\phi^* = 0.5$ ). Indeed, the rich always prefer majoritarian democracy because they can implement their dictatorial policy, and the middle class always choose the consensual constitution because it is always part of the government coalition (which allows her to have a higher utility than in majoritarian democracy). Again, the poor are the swing voters. When there are more rich than poor in the society ( $m^r > m^p$  or  $\phi < 0.5$ ) so that the rich are agenda setter if the game reaches the second round, the middle class optimally chooses the poor as coalition partner at round 1 because they are cheaper to buy. The utility of the poor is equal to their income, and therefore it is higher than in majoritarian democracy where they pay taxes and do not get any amount of their preferred public good. Therefore, the poor vote for the consensual system, which in turn is the one chosen by the society. Vice versa, when the poor are more than the rich ( $m^r < m^p$  or  $\phi > 0.5$ ) and therefore they are agenda setter at round 2, their vote is more costly to buy and the middle class prefers the rich to the poor as coalition partner at round 1. We have shown above that the poor derive more utility in majoritarian democracy (because they pay lower taxes) and therefore they choose this constitutional system.

From the above analysis it is immediate to verify that even with a complete deterministic agenda setter we have the result that the level of taxation and the size of government in a consensual democracy is generally higher

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<sup>50</sup>See the proof of Result 1 at  $\phi = 1$ .

than that obtaining in majoritarian democracy.<sup>51</sup> Moreover, the tax rate and public expenditure in consensual democracy under the middle class and poor coalition are also generally higher than under the middle class and rich coalition.

Finally, we consider the case where there is one more stage where the agenda setter is the group which was not agenda setter in the previous two stages. When  $m^p > m^r$  we have that the middle class is agenda setter at round 1, the poor at round 2, and the rich at round 3. If the game reaches the third round, the rich make the coalition with the poor. At round 2 the poor will find cheaper to buy the middle class. The middle class agenda setter at round 1 makes the government coalition with rich, as in the previous framework. It can be shown that the policy implemented is very close to the one obtaining with two stages only. When  $m^p < m^r$ , the legislative bargaining game is the following. The middle class is agenda setter at round 1, the poor at round 2, and the rich at round 3. The rich optimally choose the poor as coalition partner at the third round and the poor make the coalition with middle class at round 2. Therefore, the middle class makes the government coalition with the rich at round 1. Again, the fiscal policy implemented is very close to the one obtaining with a bargaining game with two stages only.<sup>52</sup>

## 7.5 Ethno-Linguistic Heterogeneity and Constitutions

So far we have focused only on purely economic heterogeneity. Another important source of heterogeneity, often correlated to some extent to the economic one, is instead that related to the ethno-linguistic, cultural and religious fragmentation of countries. Some Continental European countries are divided by important cleavages along these lines. For instance, in Switzerland the religious cleavage divides the Christian Democrats, supported by practising Catholics, from the Social Democrats and the Radicals who are mostly supported by Protestants and by non-observant Catholics, among the others. In Belgium, linguistic differences between French and Dutch-speaking parties constitute an important political cleavage. In the Netherlands, a significant religious cleavage is that dividing Catholics and Protestants. However, the American society stands alone for its exceptional

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<sup>51</sup>As in the baseline framework, it is required a very small degree of dispersion in the income of the three classes (which we assume to exist) to generate this result.

<sup>52</sup>In both cases ( $m^p > m^r$  and  $m^p < m^r$ ) the difference in the fiscal policy implemented by the middle class at round 1 with respect to the two stages game comes from a small difference in the participation constraint in the coalition partner.

degree of ethnic and cultural fragmentation.

The importance of non-strictly economic cleavages for the politics of redistribution and of labor relations in the U.S. has been stressed in a long tradition of thought going back to Marx and Engels, who have been among the first to stress the role of ethnic diversity in undermining the development of the class consciousness of the workers in America (see Lipset and Marks, 2000, ch. 1, p. 29). Sociologists, historians and political scientists have widely recognized that, whereas in Europe the class cleavage was the predominant one, in the U.S., the lower strata of the populations have always identified themselves primarily in terms of their ethnic origin and religious affiliation (e.g. Katznelson, 1981). The prevalence of cultural, ethnic and religious identifications within American workers over the strictly economic one, has arguably had important consequences for the political development of that country. For instance, Lipset and Marks (2000, ch. 4, p. 159) write that the ultimate consequence of ethnic divisions among workers in America was “to weaken the drive for a labor or socialist party representing workers as a class”.<sup>53</sup> An immediate corollary of this is that a relatively high ethnic fragmentation, by weakening the political strength of the left, should be expected to have a negative effect on the extent of the fiscal redistribution of income promoted by the government.<sup>54</sup>

Economists have not paid much attention to the effects of non-economic heterogeneity for economic policy, and in particular for public finance outcomes. One notable exception is a paper of Alesina, Baqir and Easterly (1999), who investigate at the theoretical and empirical level the role that ethno-linguistic fragmentation has for the provision of public goods in American cities and find that indeed more of former implies lower provision of the latter. However, they abstract from the general political equilibrium channel related to constitutional choice.

The relationship between ethno-linguistic fragmentation and constitutional choice is actually not very clear. Indeed Lijphart (1999), argues that ethnic-fragmentation is an important determinant of the adoption of consensual democracy in Europe, whereas Aghion, Alesina and Trebbi (2002)

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<sup>53</sup>In particular, ethnic fragmentation in the U.S. has been one of the main reasons of why the Socialist party and the unions never managed to achieve that degree of coordination and integration that was determinant for the success of the left and of the workers' movement in Europe. The appeals to workers class-consciousness of the former stroked with the particularism and cultural loyalties of the craft unions which dominated the American Federation of Labor (see on this point Lipset and Marks, 2000, ch. 3, p. 113).

<sup>54</sup>The importance of ethnic-fragmentation in the U.S. fiscal policy and constitutional choice is also analyzed in Alesina and Glaeser (2003).



present evidence according to which more “insulated” political systems, which they identify also with the presence of winner-takes-all electoral rules, are associated with fragmented societies. With this caveat in mind, we can suggest how our baseline model could be modified to provide some insight on the case of the U.S., which are a majoritarian democracy with a very high fragmentation, especially among the poor. To this end, assume that there is some cultural and ethnic fragmentation within the poor only, while the rich and the middle class remain completely homogeneous groups. Hence, there are different groups within the poor and we may assume that each of them care about a specific public good only. In these conditions, it is not easy to determine the effect of fragmentation among the poor on their bargaining power which, as we know, is the critical variable for constitutional choice. However, suppose that there is a minimum size to the amount of the public good provided to each group. In this instance, it is immediate to deduce from the participation constraint of the poor that, if fragmentation among them is high enough (i.e. the number of subgroups is sufficiently large), the rich will be cheaper to buy for the middle class. This in turn should lead to the adoption of a majoritarian constitution.

## **8 Some Historical Evidence on Inequality, Class Preferences and Constitutional Choice**

In this Section we present historical evidence on the constitutional choice of some European countries and of the U.S. that appears consistent with our theory. We document the fact that, historically, majoritarian democracies (U.K., U.S.) have been the expression of the interests of the rich while the adoption of consensual constitutions in most European countries has reflected the power of the left in relatively equal societies.

In the political science literature there are two different views on the adoption of consensual democracy. In his classic contribution, Rokkan (1970) explains the introduction of proportional representation in Europe as a strategic choice of the traditional XIX century liberal parties to preserve part of their political power in spite of the gradual franchise extension, and of the consequent increasing importance of new mass political parties, in particular Socialist ones. However, Sartori (1994, ch. 4) emphasizes that the most important effect of proportional representation has been quite different, namely to allow the integration of Socialist parties into the political system. Indeed, co-optated as partners of center-left government coalitions, these parties were induced to accept *de facto* the Bourgeois state and the

logic and procedures of democratic confrontation, as opposed to that of class struggle. The “integration view” on the adoption of proportional representation is compatible with our basic proposition of the importance of income inequality for the choice of political institutions. Proportional representation could serve in Europe to the need of integrating a strong left into the political system, precisely because a relatively egalitarian distribution of income did lead to the formation of center-left government coalitions under a constitution of consensual type. Along the same lines of Sartori, Alesina and Glaeser (2003) present extensive evidence that the adoption of proportional representation in European countries has reflected the political power of the left, which believed to obtain an advantage from the introduction of this electoral system.

## 8.1 The Making of Majoritarian Constitutions

The U.S. have the oldest written constitution of the world, dating to 1787. It was drafted by a Constitutional Convention of delegates from all States (apart Rhode Island) that met in Philadelphia. Apart from some relatively minor changes, it has remained essentially the same up today, representing along with the British constitution the archetype of the model of majoritarian democracy. An economic analysis of the American constitution has been provided by Beard (1913) in a seminal contribution.<sup>55</sup>

Beard’s work and our paper share the premise that key constitutional principles ought to be interpreted from an economic perspective, namely as reflecting the interests of particular social groups or classes as opposed to the “public good”. His basic argument is that the constitution of the U.S. has been drafted to reflect essentially the interests of the economic elite of the time.<sup>56</sup> These were essentially those of securing individual property rights, and of guaranteeing the best possible institutional framework for private

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<sup>55</sup>We thank Alberto Alesina for bringing this book to our attention.

<sup>56</sup>In the first chapter of his study, Beard writes (see p. 13) that “Inasmuch as the primary object of a government, beyond the mere repression of physical violence, is the making of the rules which determine property relations of members of society, the dominant classes whose rights are thus to be determined must perforce obtain from the government such rules as are consonant with the larger interests necessary to the continuance of their economic process, or they must themselves control the organs of government. In a stable despotism, the former takes place; under any other system of government, where political power is shared by any portion of the population, the methods and nature of this control become the problem of prime importance - in fact, the fundamental problem in constitutional law. The social structure by which one type of legislation is secured and another prevented - that is, the constitution - is a secondary or derivative feature arising from the nature of the economic groups seeking positive action and negative restraint.”

economic activity.<sup>57</sup> Beard bases his conclusions on a large body of diverse pieces of evidence, ranging from the records of the debates in the Convention to the contemporary pamphlets and newspapers such as *The Federalist*. Two particularly interesting pieces of evidence reviewed by Beard are reported below.

The first one concerns the economic interests of the members of the Convention. Not one member represented in his own personal interests the small farming or “mechanic” classes. Vice versa, other interests such as public security, personalty invested in lands for speculation, personalty in mercantile, manufacturing and shipping lines, and personalty in slaves were all extensively represented. In other words, the Convention clearly represented only the interests of the rich (that is, the interests of the commercial and financial elite as well as of the landlords), whereas the middle and the lower classes basically did not have any voice in it at all. This reflected both the strong franchise restriction of the time, by which large masses were deprived of any political right, and the low “class-consciousness” and ability to organize themselves of those people who had the right to vote, but not enough income or education to let their voice be heard.

The second piece of evidence cited by Beard demonstrates the extraordinary awareness of the economic elite about the nature of her interests in the process of constitution making.<sup>58</sup> *The Federalist* presented the political science of the new system as conceived by Hamilton, Madison and Jay. Its main practical goal was to convince the economic aristocracy, the landlords, as well the bankers, financiers and entrepreneurs of the safety of the new con-

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<sup>57</sup>Beard (see p. 324) writes: “The movement for the Constitution of the United States was originated and carried through principally by four groups of personalty interests which had been adversely affected under the Articles of Confederation: money, public securities, manufactures, and trade and shipping. The first firm steps toward the formation of the Constitution were taken by a small and active group of men immediately interested through their personal possessions in the outcome of their labors.”

“...A large property mass was, under the prevailing suffrage qualifications, excluded at the outset from participation (through representatives) in the work of framing the Constitution. The Members of the Philadelphia Convention which drafted the Constitution were, with few exceptions, immediately, directly, and personally interested in, and derived economic advantages from, the establishment of the new system.”

He also adds (see p. 325) that: “In the ratification, it became manifest that the line of cleavage for and against the Constitution was between substantial personalty interests on the one hand and the small farming and debtor interests on the other. The Constitution was not created by “the whole people” as jurists have said; neither was it created by “the states” as Southern nullifiers long contended; but it was the work of a consolidated group whose interests knew no state boundaries and were truly national in their scope.”

<sup>58</sup>Interestingly, this confirms that our assumption on the absence of a veil of ignorance in choosing the constitution is appropriate.

stitution for their own interests. It is remarkable that in the tenth number of *The Federalist*, Madison argued that the first concern of every government is economic. According to Madison, “The first object of government is the protection of the diversity in the faculties of men, from which the rights of property originate.” For this to be possible, a fundamental goal to be pursued by an appropriate constitution is of creating a legal and institutional framework allowing to prevent the exploitation of a minority, the rich, by a majority, which he prophesied to be the landless proletariat.

Alesina and Glaeser (2003) argue, in agreement with our results, that proportional representation was never introduced in the U.S. afterwards for two reasons. First, this constitutional framework would have favored the African-Americans and the new immigrant population, which could well be identified with the poor. Second, the conservative forces of this country (representing the rich) have always been too powerful to allow such an important reform. Moreover, the need to integrate the left in the political system has always been limited as the American Socialist party never achieved a strength high enough to let it represent a serious potential threat to the preservation of the socio-economic organization of society, as its counterparts did in many European countries. Lipset and Marks (2000) argue that one of the main reason of the historical weakness of the American socialist party was its failure to establish an organic relation with unions, that instead turned out to be instrumental for the political success of the left in Continental Europe. Such an alliance never took place in the U.S. also because of the pervasive ethno-linguistic and cultural fragmentation of the workforce which, unlike in Europe, dominated over the strictly economic cleavage related to class belonging.<sup>59</sup> This point is also stressed in Alesina and Glaeser (2003).

England has the oldest unwritten constitution of the world. It consists in a collection of different documents including the *Magna Charta* of 1215, the *Bill of Rights* of 1689, commonly observed practices and conceptions, as well as some laws.

England reformed her electoral system three times during the 19<sup>th</sup> century (in 1832, 1867 and 1884 respectively) and this sequence of reforms gradually extended franchise by reducing the minimum amount of personal income necessary to vote. Bagehot (1873) argues that the people (largely from the lower middle class) that were given the right to vote by the new

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<sup>59</sup>According to Lipset and Marks other explanations of the “American exceptionalism” include the influence of Protestant ethics and the absence of the feudal structures typical of the European societies.

laws did not elect their own representatives, but preferred representatives from the economic elite, whether lords or simply rich people. He claims that the main effect of these electoral reforms, at least for several years, was a reallocation of political power within the existing economic elite of the country and the enlargement of suffrage did not entail any political and economic gain for most of those concerned for a relatively long period. Acemoglu and Robinson (2000) have recently explained the extension of voting rights in Western societies (especially England) as a strategy pursued by the elites to provide redistribution to the poor in order to prevent social unrest. This argument is not incompatible with our story. Indeed, majoritarian democracy is the system where fiscal policy better reflects the preferences of the rich, which would choose this democratic system, if possible, when franchise needs to be extended to prevent a revolution. It is remarkable that the two oldest democratic constitutions, adopted at times during which the political voice of the rich was determinant, and therefore reflecting presumably the latter's economic interests, are both majoritarian constitutions. Our model, with its key implication that majoritarian democratic institutions represent the interests of the rich, can account for this fact.<sup>60</sup>

## 8.2 The Birth of Consensual Democracies

Essential elements of the model of consensual democracy, and in particular a proportional electoral system, have been first introduced in Scandinavian countries (Denmark, Norway, Sweden, Finland) and elsewhere in Northern Europe (the Netherlands) between the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century. By 1921, all Scandinavian countries had adopted some form of proportional system and none of them has been discarded afterwards, even for a short period (see for instance Lakeman and Lambert (1963)).

The first national election based on the principle of proportional representation took place in Denmark in 1856, but the particular method employed was restricted to 55 out of the 80 members of the single-chamber parliament. The degree of proportionality of the Danish electoral system has then been increased gradually over time through a sequence of partial reforms until 1920, when it has been entirely put on a proportional base. Some evidence on the evolution of the income distribution of Denmark is presented in Morrisson (2000) and clearly suggests that during these electoral reforms the degree of income inequality was relatively low and decreasing

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<sup>60</sup> According to Alesina and Glaeser (2003), England never adopted a proportional representation because the labor movement only gained power when it became the largest party.

over time.<sup>61</sup>

Norway introduced proportional representation in 1921 when the degree of income inequality was relatively low. Indeed, the available evidence illustrated in Morrisson (see table 2, p. 224) shows a fall in the Gini coefficient from 0.68 in 1855 to 0.49 of the period 1865-1900 to 0.40 of 1900-1910 to 0.34 of 1920.

The Netherlands adopted a proportional electoral law as early as 1917. There is evidence that income inequality has decreased in the Netherlands since the end of the nineteenth century, with the exception of some temporary increments due to exogenous shocks. Morrisson (see p. 229) reports that the income data in Amsterdam indicate that there was a fall in income inequality in the last two decades of the nineteenth century. However, there is no precise evidence on the exact extent of income inequality for this country at the time when the constitution was made.

The political development of Denmark, Norway and the Netherlands appears consistent with our theory while the cases of Finland and of Sweden we now describe are less so. Sweden switched to proportional representation in 1907. According to Morrisson, inequality has increased in Sweden since 1870, reaching its peak between 1890 and 1913, and has had a declining trend from 1914 to 1970, when it has stabilized. Finland adopted proportional representation in 1906, a period for which there is limited information on income inequality for this country. However, Morrisson (p. 228) reports that inequality in Finland has increased from 1881 to 1890 and decreased in the twentieth century.

In all the above countries there is also clear evidence that income inequality has declined after the adoption of proportional representation suggesting that it is indeed the case that a consensual constitution should help reducing over time the initial degree of income inequality.

Piketty (2001) provide evidence on the occurrence of a sharp fall in income inequality associated to a sensible drop in the top percentile income share that has taken place in France during the period 1914-1945 and mostly during World War II. This trend has been driven primarily by the shocks represented by the two World Wars and by the events of the inter-wars pe-

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<sup>61</sup>The data on income inequality in Denmark are based on the maximum equalization coefficient (MEC), which indicates the share of total income which has to be transferred from the population with income above the average to the other people in order to achieve an equal distribution. This index falls sharply from 0.50 to 0.35 between 1870 (first year for which the data are available) and 1900. The value of this index increases somewhat during the First World War years but quickly reverts to the pre-war values: in 1925 it was 0.36.

riod (inflation and Great Depression). We have described the effects of this change in the income distribution in the mean preserving spread 2 whose analysis suggests that this reduction in inequality should lead to the adoption of a consensual constitution. Interestingly, in the immediate aftermath of both the First and the Second World War, France switched to a proportional electoral law. In 1919, the Third Republic did so, even if the proportionality of the electoral system was quite weakened by compromises made with advocates of the majoritarian system. This system was abandoned after the 1924 election, and France reverted to the second ballot in single-member constituencies used until the war. In October 1945, a real proportional system was applied to the election of the first Constituent Assembly. The same system was applied for the election of the Second Constituent Assembly in June 1946 and of the National Assembly in November.

The two World Wars and especially the second one, have presumably affected, in terms of capital disruption and reduction of inequality, other Continental European countries directly hit by them such as Italy and Germany. Italy had adopted a majoritarian electoral law at the time of her unification. The country switched to proportional representation in 1919 and adopted it until the rise of fascism. After World War II, a proportional system was again adopted for the parliamentary democracy established with the constitution of 1948. Proportional representation has also been introduced in Germany with the constitution of the Weimar Republic in 1919, which collapsed in 1933. A parliamentary system with proportional representation has been again introduced after 1945. The available evidence (see Morriison, p. 232) indicates that income inequality has strongly decreased in Germany from 1913 to 1926 and it was low after the Second World War.

Summarizing, we can conclude that the history of the political and economic development of France, Italy and Germany in the first half of the twentieth century is quite in agreement with our model: a substantial and persistent reduction of inequality has been associated twice (and just about at the same time) in all of these countries with the adoption of a consensual constitution.

Alesina and Glaeser (2003) present evidence that the adoption of proportional representation in several European countries reflected the political power of the left, which believed to obtain an advantage from the introduction of this electoral system. In their review of historical evidence, Alesina and Glaeser show that this was the case for Belgium, Finland, Switzerland, Austria, Italy, Germany and France where this transition toward proportional representation was sometime accompanied by a breakdown in law and order. Denmark and the Netherlands moved instead to proportional

representation in a more gradual way.<sup>62</sup>

## 9 Constitutions and Politics in Contemporary Democracies

In the previous Section we have presented some historical evidence that supports our key result about the endogeneity of the constitution and the effects of income inequality on constitutional choice. The political equilibrium of our model has also other features that are consistent with the available empirical evidence and that we discuss below.

A first prediction of our model is about the size of government and the composition of government spending across constitutions. Consensual democracies should have bigger governments than majoritarian ones and a greater part of government expenditure should go to the advantage of a greater number of social groups and, in particular, to lower income individuals (the poor and the middle class). These results are in line with the recent theoretical literature, e.g. Persson and Tabellini (2000a, Ch. 8 and 9), Lizzeri and Persico (2001), Milesi-Ferretti, Perotti and Rostagno (2002), that generally predicts that proportional electoral systems should be associated with the provision of more public goods, larger and more universalistic welfare programs, and a larger overall size of government. Indeed, it is reasonable to think that the public goods preferred by the poor and the middle class in our model are universalistic welfare programs that benefit a larger fraction of the population like health and education.

The empirical literature on this topic also confirms our results. Some preliminary evidence based on cross-country regressions on the size and composition of government expenditure can be found in Lijphart (1999, ch. 16). According to Lijphart consensual democracies spend on average 5.3% percent more of their gross domestic product on welfare programs. The very same relation is manifest (and robust) in terms of the well known index of “decommodification” elaborated by G. Esping-Andersen.<sup>63</sup>

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<sup>62</sup>We have not discussed the case of Belgium, Switzerland and Austria because we did not find data on income inequality in these countries. Alesina and Glaeser also illustrate the case of Sweden where proportional representation was instead preferred by the conservative forces which expected to be a minority after the extension of the franchise. That is, the case of Sweden appears to fit well with the theory of Rokkan.

<sup>63</sup>This index measures the extent to which welfare benefits (with regard to unemployment, illness, disability and age) are independent on market outcomes. Lijphart finds that the index of decommodification is indeed higher in consensual democracies.



Persson and Tabellini (2000b) find that the electoral rule exerts a very strong influence on fiscal policy outcomes. They explicitly consider the issue of the endogeneity of the constitution by estimating with different techniques a two equations system including a constitution selection and a fiscal policy outcome equation. The system is first estimated with OLS under the assumption of conditional independence and of linearity of the functional forms, and then with other techniques relaxing both assumptions. All of the results obtained go in the same direction of pointing out that government expenditures as a share of GDP are sensibly higher in consensual democracies and that this is so due to a causal effect of the constitution on policy outcomes. Indeed, their cross-country evidence based on a sample of 85 democracies in the 1990s suggests that a switch from proportional to majoritarian elections reduces total government spending by almost 5% of GDP and welfare spending by 2-3% of GDP.<sup>64</sup> This result is confirmed by a panel-data analysis on a subset of 60 countries for the period 1960-1998,<sup>65</sup> and by Persson and Tabellini (2002) which use quasi-experimental, matching methods, on a dataset of more than 80 countries in the 1990s.

Milesi-Ferretti, Perotti and Rostagno (2002) use a dataset of 20 OECD countries (from 1960) and 20 Latin American countries (for a shorter period). The authors emphasize the distinction between transfers, which can be targeted to social groups with relative ease (e.g. unemployment benefits, pensions, etc.), and expenditure in public good and services, which are easier to target geographically. Consistently with their theoretical model, they find that the size of government and expenditure on transfers is higher in proportional systems while the expenditure on purchases of goods and services is higher in majoritarian systems.<sup>66</sup> They interpret this result as confirming the widespread notion that proportional systems allow the representation of a greater variety of interests, while majoritarian systems are more grounded in local interests.

Further evidence and a theoretical and empirical survey on the effect

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<sup>64</sup>Persson and Tabellini also distinguish on the base of the form of government. Their OLS estimates indicate that a constitutional reform involving the adoption of a presidential form of government with a majoritarian electoral system would reduce the size of government by 10% of GDP with respect to a proportional-parliamentary system.

<sup>65</sup>Indeed, they find that the increase in overall and welfare-state spending taking place in the 1970s and 1980s was much more pronounced in proportional than in majoritarian countries. Again, the authors find a very similar result to that of the cross-section analysis. The cumulative difference across electoral rules amounts to about 5% of GDP for total government spending, and about 2% of GDP for welfare spending.

<sup>66</sup>This relationship is very robust in the OECD sample but much weaker for Latin American data.

of constitutions on policy outcomes can be found in Persson and Tabellini (2003).

Our contribution can also shed some light on the argument usually made that public expenditure is higher under proportional electoral systems than under majoritarian ones because the former favor the representation of many groups and the formation of multi-party coalition governments, which in turn spend more because they need to please broader and more diverse constituencies than single-party executives. Instead, according to our model, the greater level of public expenditure observed in consensual democracies is due to the *selection bias* in the *composition of the government coalition*. In particular, consensual democracies should be expected to be ruled more often by center-left coalitions while the right should have an advantage in majoritarian constitutions. The empirical evidence suggests that indeed center-left government coalitions can be observed more often in proportional systems (and right-wing governments in majoritarian democracies) and that left-wing executives tend to tax and spend more than right-wing ones.

An index of partisanship of the government for several OECD countries on the left-right dimension has been compiled by Cusack (1997). Table 1 reports the average values of the Cusack index for fifteen democracies over the periods 1950-1959, 1960-1969, 1970-1979, 1980-1991.<sup>67</sup> The index ranges from 1 (extreme left) to 4 (extreme right).<sup>68</sup> Over the whole period 1950-1991, the average value of the Cusack index is 3.49 in majoritarian democracies (Australia, Canada, U.K., U.S. and France) and 2.8 in consensual democracies (Austria, Belgium, Denmark, Finland, Germany, Italy, Norway, the Netherlands, Sweden and Switzerland).<sup>69</sup> This result clearly corroborates the prediction of our model according to which consensual democracies should be ruled relatively more often by center-left governments whereas majoritarian democracy should advantage conservative parties.

A dataset containing information on the government partisanship over the period 1950-1999 in various industrial democracies has also been com-

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<sup>67</sup>The data are taken from table 1 in Cusack (1997) at pp. 383. We have dropped Japan for cultural factors and therefore we only consider Western democracies.

<sup>68</sup>Basically, the index is based on the computation of the “political center of gravity” of a government, defined as the average ideological collocation of the parties of the coalition on the left-right continuum, weighted by the share of seats of each of them. See Cusack (1997) pages 381-2 for a precise definition of the index.

<sup>69</sup>The results do not change if we consider the subperiods. Indeed, for consensual democracies the index gets the following average values: 2.844 in 1950-59, 2.805 in 1960-69, 2.604 in 1970-79, 2.962 in 1980-91. The average values for majoritarian democracies are: 3.72 in 1950-59, 3.46 in 1960-69, 3.408 in 1970-79, 3.384 in 1980-91. It is interesting that the variability of this index over time for our sample is very small.

piled by Swank.<sup>70</sup> The dataset provides information about the composition of governments and the ideological orientation of parties along the right-center-left scale.<sup>71</sup> We have a total of observations for sixteen countries. Since our theory assumes that no party has more than 50% of the votes (and therefore parliamentary seats), which means that governments are always formed by multi-party coalitions in consensual democracies, we drop 42 observations relative to single-party executives in countries with a consensual constitutions. We are then left with 183 observations for consensual democracies. We find that 116 out of 183 observations, namely 63.3% of the total, correspond to governments which are supported by center-left coalitions, while the remaining ones are center-right executives. In majoritarian democracies 68 of the 99 governments formed between 1950 and 1999, namely almost 70% of the total, were right-wing executives while the remaining were left-wing ones.

There is also a large body of empirical evidence both in political science and economics about the effects of the government's ideology on fiscal policy outcomes suggesting that left-wing executives are willing to tax and spend more than right-wing ones. For example, Cameron (1978) finds that the rate of expansion of the ratio of total government revenues to GDP for the years 1960-1975 has been higher in countries where the government was generally controlled by a social-democratic party. Swank (1978) provides evidence that the control of the government by right-wing (center and left-wing) parties has had negative (positive) effects on public spending in advanced industrial democracies over the period 1960-1973. Lijphart (1999) highlights that many studies have shown that there are important differences between the socioeconomic policies that are pursued by left-wing and right-wing parties and governments. In particular, leftist parties and governments have systematically produced among others a higher growth rate of the public sector, more income equalization and higher expenditures on education, public health, and social welfare programs. He also summarizes this evidence with the statement of Tufte (1978, p. 104) which claims that "The single most important determinant of variations in macroeconomic performance from one industrialized democracy to another is the location on the

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<sup>70</sup>The dataset can be downloaded from the homepage of Duane Swank at <http://www.marquette.edu/polisci/Swank.htm>.

<sup>71</sup>The countries are the same as in the Cusack's sample plus New Zeland (majoritarian democracy). We have dropped Greece, Portugal and Spain because there were not democracies for a large period considered by the dataset. France has been considered from 1959 when became a majoritarian system. Japan has also been excluded for the same reasons explained before.

left-right spectrum of the governing political party.” Huber and Stephens (2001) survey a large political science literature that argues that the presence of socialist parties in the government leads to the adoption of more generous welfare states. The political economy literature, whose results are summarized by Alesina, Roubini and Cohen (1997), has also analyzed this issue. These authors show that left wing parties tend to spend and tax more than right wing parties and provide an extensive discussion of the ideological differences between American parties in macroeconomic policies. A recent contribution of Perotti and Kontopoulos (2002) provides further evidence that fiscal policy outcomes are affected by government ideology in a group of 19 OECD countries over the period 1970-1995. Specifically, they find that left-wing executives spend systematically more, in particular in transfers and in wage government consumption, and run larger budget deficits, than right-wing ones.<sup>72</sup>

The results of our model can also help us to better understand the relationship between the distribution of income and fiscal policy outcomes. Much of the research on this topic is based on the seminal contribution of the model of majority voting on linear tax schedules of Meltzer and Richard (1981).<sup>73</sup> It is well known that the key reduced form prediction of this model is that a higher (pre-tax) inequality in the distribution of income should be expected to generate the political support for a larger fiscal redistribution of resources.

This theory faces a major empirical problem however, as the available evidence hardly provides any support in favor of it.<sup>74</sup> Perotti (1996) and most of other studies reviewed in Bénabou (1996) find no relationship between inequality and the share of transfers or government expenditures (or social expenditures) in GDP. Among industrial democracies the more unequal countries tend to redistribute less, instead than more. The typical

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<sup>72</sup>On the importance of the left-right dimension for the government policy see also Alesina and Glaeser (2003).

<sup>73</sup>A notable example is represented by the literature of the political economics of fiscal policy and endogenous economic growth (e.g. Alesina and Rodrik, 1994, or Persson and Tabellini, 1994).

<sup>74</sup>The application of the median voter theorem, as done in many political economy models, is also questionable on purely theoretical grounds. The median voter theorem is based on the assumption that individuals vote directly on policy, that is to say that direct democracy exists. However, this is not the case in virtually any contemporary democratic state (and it has hardly ever been so in any historical instance - e.g. Pericles' Athens) where decisions are taken by elected representatives or leaders. In principle, it is not at all obvious that the policy outcome predicted by the median voter theorem should be observed also in a richer and more realistic politico-institutional setting, namely closer to the description of a representative democracy.

example is that of the U.S. versus Europe (see on this Alesina, Glaeser and Sacerdote (2001)) but the negative relationship between inequality and redistribution also holds within European countries.

A number of different approaches have been followed to resolve this puzzle. Saint-Paul and Verdier (1996) argue that indeed it is *not* a general result that *any* mean-preserving spread should increase the distance between the median and the mean income, which is what really drives the political support for fiscal redistribution according to the median voter theorem. However, the variance is a sufficient statistics for the distance between the median and the mean in the case of the log-normal distribution, which is particularly relevant as it approximates quite well the empirical distribution of income in OECD countries. Saint-Paul (2001) shows that an increase in inequality that is concentrated among the poorest hardly affects the decisive voter, for whom the returns from redistributing income may well fall. He claims that this may explain the rise of inequality, poverty and fiscal conservatism of many economies, like U.S. and U.K., that has taken place since the mid-seventies. Bénabou (2000) maintains the assumption of a majority voting-based political mechanism, but allows for some income-human capital related bias in the political system, motivated by the observation that turn-out rates are usually (much) lower for the relatively poor and uneducated. Alternatively, Rodriguez (1999) does away with voting and proposes a very different political mechanism based on lobbying activities, in which the political voice of the poor is limited by credit constraints.

In this paper we show that the distribution of income can be an important determinant of the constitutional choice and that in turn income inequality can have very different effects on fiscal policy outcomes depending on the constitution adopted and the “kind” of inequality considered. We have found that more equal societies are more likely to adopt a consensual constitution (under which taxation and redistribution are higher than under a majoritarian one) and that majoritarian constitutions are more often observed in more unequal economies (which in turn spend and redistribute less). Therefore, an increase in inequality that determines a change in the constitution from consensual to majoritarian leads to a lower taxation and redistribution generating the negative relationship between inequality and redistribution that has been found in the empirical studies.

However, income distribution has also a direct effect on taxation and redistribution, i.e. it affects fiscal policy given the constitution. In a consensual democracy an increase in inequality generally leads to an increase in taxation and redistribution, if it does not determine a change in the ruling government coalition. The effect of the increase in inequality has the oppo-

site sign if it generates a change in the ruling coalition (namely a switch from a middle class and poor to a middle class and rich government coalition). In a majoritarian democracy, an increase in inequality affects taxation and redistribution only if it is associated to a variation in the income of the rich.<sup>75</sup>

We conclude by remarking that our theoretical results on the effects of inequality on economic policy as well as on institutional choice provide also important guidelines for future econometric research on the influence of constitutions on fiscal policy. For example, they suggest that in order to estimate consistently with OLS a two equations system where fiscal policy outcomes and the constitution are jointly endogenous, as Persson and Tabellini (2000b) do, it is important to include a control for inequality in both the fiscal policy and in the constitution selection equation. This is so in order to avoid the omitted variable problem which would otherwise arise according to our theory, causing the bias of the OLS estimate of the model.

## 10 Conclusions

This paper shares with other recent contributions in political economics the premise that constitutional principles are of great importance in shaping fiscal policy outcomes in representative democracies. We show that “generally” consensual democracies tax more and spend more (that is, have larger governments) than majoritarian ones, for a given mean level of income. But on top of this we demonstrate that, once institutions are viewed as endogenous, consensual democracy is more difficult to sustain politically in a more unequal society since greater inequality tends to undermine the stability of the coalition supporting it.

We also obtain that the higher taxation and the size of government that characterize consensual democracies is due to the selection bias in the composition of the government coalition as consensual democracies should be expected to be ruled more often by center-left coalitions, while the right should have an advantage in majoritarian constitutions. Finally, our model provides a new and alternative rationalization, based on the choice of different democratic constitutions, of the relationship between income inequality, government size and redistribution observed in the data.

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<sup>75</sup>If the increase in inequality is associated to a higher income of the rich, then taxation should be expected to fall.

# 11 Appendix

## 11.1 Proof of Proposition 1

We first prove that only the rich run for office and then that the set of citizen-candidates running for office is not empty.

**Step 1.** Assume that at least one rich candidate runs for office. Would anyone else run for office? The answer is no. If a middle class agent also run, he would be defeated by the rich candidate because both the rich and poor would vote for the rich. Indeed, the poor find it convenient to vote for the rich candidate because in their eyes he is the less bad of the two of them: he offers to the poor none of their preferred public good but demands lower taxes. Similarly, if a poor agent runs for office against a rich candidate, he would be defeated by the vote of the middle class and the rich. Lastly, notice it cannot be the case that (at least) a candidate from each group runs for office. Indeed, the middle class candidate would win the election with certainty in that instance (recall that  $m^b > \max \{m^p, m^r\}$  by assumption), and therefore neither a poor nor a rich candidate would run against him.

**Step 2.** We now demonstrate that the set of citizen-candidates running for office is not empty, i.e. that at least one rich candidate runs for office. Let  $p$  indicate the probability of victory for a rich citizen-candidate (in a symmetric equilibrium, this will be identical across identical citizen-candidates). A rich agent wants to run for office if and only if the expected gain of running exceeds its cost, namely if

$$\{p [w^r (\tau^r, G^r) + k] + (1 - p) w^r (\tau^r, G^r)\} - w^r (\bar{\tau}, \bar{G}) \geq \varepsilon \quad (22)$$

where  $(\bar{\tau}, \bar{G})$  indicates the policy vector implemented if he does not run and the term in the graph parenthesis is the expected utility if he runs, given that only rich candidates do so. To show that the set of citizen-candidates running for office is not empty, it is sufficient to demonstrate that (22) is satisfied when only one rich person runs for office  $\forall (\bar{\tau}, \bar{G}) \in \{[0, 1] \times \mathfrak{R}_+^3\}$ . To see this, observe that in this case  $p = 1$  and (22) reads  $w^r (\tau^r, G^r) + k - w^r (\bar{\tau}, \bar{G}) \geq \varepsilon$ . Since the policy vector  $(\tau^r, G^r)$  maximizes the welfare of the rich,  $w^r (\tau^r, G^r) > w^r (\bar{\tau}, \bar{G})$ ,  $\forall (\bar{\tau}, \bar{G}) \in ([0, 1] \times \mathfrak{R}_+^3)$  with  $(\bar{\tau}, \bar{G}) \neq (\tau^r, G^r)$ , and given that  $k \geq \varepsilon$ , (22) always holds with strict inequality when  $p = 1$ . This means that the unique rich candidate running for office is strictly better-off than his peers, which in turn implies that more than one rich candidate will run. Therefore,  $(\bar{\tau}, \bar{G}) = (\tau^r, G^r)$  and

the no-deviation condition assumes the form  $pk \geq \varepsilon$ . Finally, free entry of candidates drives the net gain of running down to zero in equilibrium, which implies that  $p = \frac{\varepsilon}{k} \in (0, 1)$ .

## 11.2 Optimization Problems in Consensual Democracy

In this Appendix we show the details of the maximization problems in consensual democracy and the derivation of the first and second order conditions.

### 11.2.1 The rich and poor coalition at round 2

The substitution of the government budget constraint (10) into (11) implies that the optimization problem for the rich can be rewritten as

$$\max_{\{\tau_{2,r,p}\}} w_{2,r,p}^r = (1 - \tau_{2,r,p}) y^r + H(\tau_{2,r,p} \bar{y} - g_{2,r,p}^p) \quad (23)$$

subject to (9). The optimal tax rate is implicitly defined by the first order condition

$$y^r = H_g(\tau_{2,r,p} \bar{y} - g_{2,r,p}^p) \left( \bar{y} - \frac{\partial g_{2,r,p}^p}{\partial \tau_{2,r,p}} \right) \quad (24)$$

where

$$\frac{\partial g_{2,r,p}^p}{\partial \tau_{2,r,p}} = \frac{y^p}{H_g(g_{2,r,p}^p)} \quad (25)$$

is obtained from the participation constraint of the poor (9). Substituting (25) into (24) we get that

$$y^r = H_g(\tau_{2,r,p} \bar{y} - g_{2,r,p}^p) \left( \bar{y} - \frac{y^p}{H_g(g_{2,r,p}^p)} \right)$$

which allows us to determine  $\tau_{2,r,p}$  and  $g_{2,r,p}^p$  once it is combined with (9). From the government budget constraint (10) it is immediate to obtain  $g_{2,r,p}^r$ .

Notice that the second order condition is always satisfied because  $w_{2,r,p}^r$  is globally concave in  $\tau_{2,r,p}$ :



$$\frac{\partial^2 w_{2,r,p}^r}{\partial (\tau_{2,r,p})^2} = H_{gg}(g_{2,r,p}^r) \left[ \bar{y} - \frac{y^p}{H_g(g_{2,r,p}^p)} \right]^2 + H_{gg}(g_{2,r,p}^p) \frac{(y^p)^2 H_g(g_{2,r,p}^r)}{[H_g(g_{2,r,p}^p)]^3} < 0$$

given that  $H_g(\cdot) > 0$  and  $H_{gg}(\cdot) < 0$ .

### 11.2.2 The poor and middle class coalition at round 2

The first order condition of the optimization problem (13) is

$$y^p = H_g(\tau_{2,p,b} \bar{y} - g_{2,p,b}^b) \left( \bar{y} - \frac{\partial g_{2,p,b}^b}{\partial \tau_{2,p,b}} \right) \quad (26)$$

and we have from (12) that

$$\frac{\partial g_{2,p,b}^b}{\partial \tau_{2,p,b}} = \frac{y^b}{H_g(g_{2,p,b}^b)}. \quad (27)$$

Substituting (27) into (26) we get

$$y^p = H_g(\tau_{2,p,b} \bar{y} - g_{2,p,b}^b) \left( \bar{y} - \frac{y^b}{H_g(g_{2,p,b}^b)} \right). \quad (28)$$

Combining the first order condition (28) and the participation constraint of the middle class (12) we get  $\tau_{2,p,b}$  and  $g_{2,p,b}^b$ . Then, from the government budget constraint

$$\tau_{2,p,b} \bar{y} = g_{2,p,b}^b + g_{2,p,b}^p \quad (29)$$

we obtain  $g_{2,p,b}^p$ .

Similarly to the previous maximization problem the second order condition is always satisfied given that  $w_{2,p,b}^p$  is globally concave in  $\tau_{2,p,b}$ :

$$\frac{\partial^2 w_{2,p,b}^p}{\partial (\tau_{2,p,b})^2} = H_{gg}(g_{2,p,b}^p) \left[ \bar{y} - \frac{y^b}{H_g(g_{2,p,b}^b)} \right]^2 + H_{gg}(g_{2,p,b}^p) \frac{(y^b)^2 H_g(g_{2,p,b}^p)}{[H_g(g_{2,p,b}^p)]^3} < 0.$$

### 11.2.3 The middle class and rich coalition at round 1

If the coalition government is made up by the middle class and the rich, the maximization problem of the middle class agenda setter is

$$\max_{\{\tau_{1,b,r}\}} w_{1,b,r}^b = (1 - \tau_{1,b,r}) y^b + H(g_{1,b,r}^b) \quad (30)$$

subject to the government budget constraint

$$\tau_{1,b,r} \bar{y} = g_{1,b,r}^b + g_{1,b,r}^r \quad (31)$$

and the participation constraint of the rich (14).

The participation constraint (14) is derived by observing that for the rich to be convinced to accept the proposal of the middle class agenda setter they must be given a level of utility at least equal to the expected utility they get conditional on the game reaching round 2, which corresponds to

$$E(w_2^r) = (1 - \phi) [(1 - \tau_{2,r,p}) y^r + H(g_{2,r,p}^r)] + \phi (1 - \tau_{2,p,b}) y^r. \quad (32)$$

This means that the policy menu  $(\tau_{1,b,r}, g_{1,b,r}^r)$  that the rich must be offered at round 1 is such that

$$(1 - \tau_{1,b,r}) y^r + H(g_{1,b,r}^r) \geq E(w_2^r). \quad (33)$$

Then, combining (32) and (33) we get the following participation constraint of the rich at the first round

$$(1 - \tau_{1,b,r}) y^r + H(g_{1,b,r}^r) \geq (1 - \phi) [(1 - \tau_{2,r,p}) y^r + H(g_{2,r,p}^r)] + \phi (1 - \tau_{2,p,b}) y^r.$$

Now, substituting (31) in (30) we get the maximization problem (15)

$$\max_{\{\tau_{1,b,r}\}} w_{1,b,r}^b = (1 - \tau_{1,b,r}) y^b + H(\tau_{1,b,r} \bar{y} - g_{1,b,r}^r)$$

subject to (14). Assuming that the participation constraint of the rich is binding (which means that (14) holds with the equality sign), the first order condition of this problem is

$$y^b = H_g(\tau_{1,b,r}\bar{y} - g_{1,b,r}^r) \left( \bar{y} - \frac{\partial g_{1,b,r}^r}{\partial \tau_{1,b,r}} \right) \quad (34)$$

and we have from (14) that<sup>76</sup>

$$\frac{\partial g_{1,b,r}^r}{\partial \tau_{1,b,r}} = \frac{y^r}{H_g(g_{1,b,r}^r)} > 0. \quad (35)$$

Substituting (35) in (34) we obtain (17). The second order condition is always satisfied as

$$\frac{\partial^2 w_{1,b,r}^b}{\partial (\tau_{1,b,r})^2} = H_{gg}(g_{1,b,r}^b) \left[ \bar{y} - \frac{y^r}{H_g(g_{1,b,r}^r)} \right]^2 + H_{gg}(g_{1,b,r}^r) \frac{(y^r)^2 H_g(g_{1,b,r}^b)}{[H_g(g_{1,b,r}^r)]^3} < 0 \quad (36)$$

which proves that the objective function  $w_{1,b,r}^b$  is globally concave in  $\tau_{1,b,r}$ .

#### 11.2.4 The middle class and poor coalition at round 1

When the middle class forms the government coalition with the poor, she solves the following optimization problem

$$\max_{\{\tau_{1,b,p}\}} w_{1,b,p}^b = (1 - \tau_{1,b,p}) y^b + H(g_{1,b,p}^b) \quad (37)$$

subject to the government budget constraint

$$\tau_{1,b,p} \bar{y} = g_{1,b,p}^b + g_{1,b,p}^p \quad (38)$$

and the participation constraint of the poor (18).

Similarly to the previous case, this participation constraint is obtained by taking into consideration the fact that the poor accept the proposal of the middle class agenda setter if the policy proposed guarantees them a

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<sup>76</sup>It is immediate to notice that the right hand side of (14) is independent both on  $\tau_{1,b,r}$  and that the policy vector implemented at round 2 is independent on  $\phi$ .

level of utility at least equal to their expected utility conditional on the game reaching round 2, which is given by

$$E(w_2^p) = (1 - \phi) y^p + \phi \left[ (1 - \tau_{2,p,b}) y^p + H(g_{2,p,b}^p) \right]. \quad (39)$$

This implies that for the poor to be willing to join the middle class at round 1, the following weak inequality must hold

$$(1 - \tau_{1,b,p}) y^p + H(g_{1,b,p}^p) \geq E(w_2^p). \quad (40)$$

From (39) and (40) we get the participation constraint of the poor in (18)

$$(1 - \tau_{1,b,p}) y^p + H(g_{1,b,p}^p) \geq (1 - \phi) y^p + \phi \left[ (1 - \tau_{2,p,b}) y^p + H(g_{2,p,b}^p) \right].$$

The substitution of the government budget constraint (38) in (37) allows us to rewrite the middle class maximization problem as in (19)

$$\max_{\{\tau_{1,b,p}\}} w_{1,b,p}^b = (1 - \tau_{1,b,p}) y^b + H(\tau_{1,b,p} \bar{y} - g_{1,b,p}^p)$$

subject to (18). The first order condition of this problem reads

$$y^b = H_g(\tau_{1,b,p} \bar{y} - g_{1,b,p}^p) \left( \bar{y} - \frac{\partial g_{1,b,p}^p}{\partial \tau_{1,b,p}} \right) \quad (41)$$

and we have from the participation constraint of the poor (18) that

$$\frac{\partial g_{1,b,p}^p}{\partial \tau_{1,b,p}} = \frac{y^p}{H_g(g_{1,b,p}^p)} > 0. \quad (42)$$

Substituting (42) into (41) leads to (27). The second order condition is

$$\frac{\partial^2 w_{1,b,p}^b}{\partial (\tau_{1,b,p})^2} = H_{gg}(g_{1,b,p}^p) \left[ \bar{y} - \frac{y^p}{H_g(g_{1,b,p}^p)} \right]^2 + H_{gg}(g_{1,b,p}^p) \frac{(y^p)^2 H_g(g_{1,b,p}^p)}{[H_g(g_{1,b,p}^p)]^3} < 0 \quad (43)$$

which means that also  $w_{1,b,p}^b$  is globally concave in  $\tau_{1,b,p}$ .

### 11.3 Proof of Proposition 2

In this Appendix we show that exist a value of  $\phi$ , that we call  $\phi^*$ , such that the utility derived by the middle class from the government coalition with the poor is higher than the corresponding utility from the coalition with the rich if  $\phi < \phi^*$ , and that the opposite is true whenever  $\phi > \phi^*$ . To this aim, we first show that the utility of the middle class in the government coalition with the rich  $w_{1,b,r}^b$  is monotonically increasing in  $\phi$ , while the utility of the middle class in the coalition with the poor  $w_{1,b,p}^b$  is strictly monotonically decreasing in  $\phi$ . Then, to prove that there is a single crossing between these two schedules in the range where  $\phi \in (0, 1)$ , we show that  $w_{1,b,p}^b$  is higher than  $w_{1,b,r}^b$  at  $\phi = 0$ , and that the opposite holds at  $\phi = 1$ .

The utility of the middle class in the government coalition with the rich  $w_{1,b,r}^b$  is defined by the maximization problem (15) subject to the participation constraint of the rich (14). Differentiating (15) with respect to  $\phi$  and applying the envelope theorem we get that

$$\frac{dw_{1,b,r}^b}{d\phi} = -H_g(g_{1,b,r}^b) \frac{\partial g_{1,b,r}^r}{\partial \phi} \geq 0. \quad (44)$$

Indeed, assuming that (14) is binding and applying the implicit function theorem we get

$$\frac{\partial g_{1,b,r}^r}{\partial \phi} = -\frac{[(1 - \tau_{2,r,p}) y^r + H(g_{2,r,p}^r)] - (1 - \tau_{2,p,b}) y^r}{H_g(g_{1,b,r}^r)} < 0 \quad (45)$$

given that the numerator is positive because it is the difference between the utility of the rich when they are agenda setter at round 2 (which is greater than  $y^r$ ) and their utility under the poor and middle class government coalition (which is lower than  $y^r$ ). In this case  $\frac{dw_{1,b,r}^b}{d\phi}$  is strictly positive. Instead, if the participation constraint of the rich (14) is not binding, then  $w_{1,b,r}^b$  is at its global maximum,  $\frac{\partial g_{1,b,r}^r}{\partial \phi} = 0$  and  $\frac{dw_{1,b,r}^b}{d\phi} = 0$ . Hence, the result in (44) shows that the utility of the middle class in the coalition with the rich  $w_{1,b,r}^b$  is monotonically increasing in  $\phi$ .

The utility of the middle class in the government coalition with the poor  $w_{1,b,p}^b$  is defined by the maximization problem (19) subject to the participa-

tion constraint of the poor (18).<sup>77</sup> If we differentiate (19) with respect to  $\phi$  and apply the envelope theorem we obtain that

$$\frac{dw_{1,b,p}^b}{d\phi} = -H_g(g_{1,b,p}^b) \frac{\partial g_{1,b,p}^p}{\partial \phi} < 0 \quad (46)$$

given that from (18)

$$\frac{\partial g_{1,b,p}^p}{\partial \phi} = -\frac{y^p - \left[ (1 - \tau_{2,p,b}) y^p + H(g_{2,p,b}^p) \right]}{H_g(g_{1,b,p}^p)} > 0. \quad (47)$$

Indeed, the numerator at the right hand side of (47) is negative because it is the difference between  $y^p$  and the utility of the poor when they are agenda setter at round 2 (which is greater than  $y^p$ ). The result in (46) means that the utility of the middle class in the government coalition with the poor  $w_{1,b,p}^b$  is strictly monotonically decreasing in  $\phi$ .

Then, it remains to show that  $w_{1,b,p}^b(0) > w_{1,b,r}^b(0)$  and that  $w_{1,b,p}^b(1) < w_{1,b,r}^b(1)$ . We prove the first inequality by showing that the participation constraints of the rich and the poor at  $\phi = 0$  imply that, for each level of tax rate chosen by the middle class, the rich have to be compensated with a greater amount of their preferred public good. Indeed, the participation constraint of the poor at  $\phi = 0$  implies that

$$H(g_{1,b,p}^p) = \tau_{1,b,p} y^p \quad (48)$$

while from the participation constraint of the rich we get that<sup>78</sup>

$$H(g_{1,b,r}^r) = \left[ (1 - \tau_{2,r,p}) y^r + H(g_{2,r,p}^r) \right] - (1 - \tau_{1,b,r}) y^r. \quad (49)$$

The expression in the square brackets in the right hand side of (49) is the utility of the rich when they are agenda setter at round 2 and it is clearly greater than  $y^r$ . Hence, it is of course the case that

<sup>77</sup>As we explained before, the participation constraint (18) is always binding and therefore it holds with the equality sign in equilibrium.

<sup>78</sup>It is immediate to verify that the participation constraint of the rich is always binding at  $\phi = 0$  because their expected utility at round 2 is greater than  $y^r$ .

$$H(g_{1,b,r}^r) > \tau_{1,b,r} y^r. \quad (50)$$

By combining (48) and (50) and taking into account also the fact that  $y^r > y^p$ , one can easily verify that for any given level of tax rate  $\tau_{1,b,r} = \tau_{1,b,p} = \tau$  we have that  $g_{1,b,r}^r > g_{1,b,p}^p$ . This in turn implies that the middle class agenda setter obtains a higher level of utility by making a government coalition with the poor instead than with the rich, i.e.  $w_{1,b,p}^b(0) > w_{1,b,r}^b(0)$ .

At  $\phi = 1$  the utility of the middle class under the government coalition with the poor  $w_{1,b,p}^b$  is equal to  $y^b$ . This result can be obtained by observing that at  $\phi = 1$  the maximization problem of the middle class is subject to the participation constraint of the poor where they are agenda setter with probability one at round 2 and maximize their utility subject to the constraint of giving to the middle class a level of utility equal to the *status quo* (which corresponds to their level of income  $y^b$ ).<sup>79</sup>

From the maximization problem of the middle class when she forms a government coalition with rich, it is immediate to verify that  $w_{1,b,r}^b$  is always greater than  $y^b$  at  $\phi = 1$ . Indeed, from the participation constraint of the rich at  $\phi = 1$ , reading

$$(1 - \tau_{1,b,r}) y^r + H(g_{1,b,r}^r) \geq (1 - \tau_{2,p,b}) y^r$$

we know that the middle class could implement the following policy:  $0 < \tau_{1,b,r} \leq \tau_{2,p,b}$ ,  $g_{1,b,r}^r = 0$ ,  $g_{1,b,r}^b = \tau_{1,b,r} \bar{y}$ . This policy satisfies the participation constraint of the rich and gives to the middle class a higher utility than her income level  $y^b$ .<sup>80</sup> Given that the optimal policy gives to middle class a higher utility than this policy, and therefore of  $y^b$ , it is clear that  $w_{1,b,r}^b(1) > w_{1,b,p}^b(1)$ .

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<sup>79</sup>Formally, the maximization problem when  $\phi = 1$  is the following:

$$\max_{\{\tau_{1,b,p}\}} w_{1,b,p}^b = (1 - \tau_{1,b,p}) y^b + H(\tau_{1,b,p} \bar{y} - g_{1,b,p}^p)$$

$$s.t. \quad (1 - \tau_{1,b,p}) y^p + H(g_{1,b,p}^p) \geq \max_{\{\tau_{2,p,b}\}} (1 - \tau_{2,p,b}) y^p + H(\tau_{2,p,b} \bar{y} - g_{2,p,b}^b)$$

$$s.t. \quad w_{2,p,b}^b \equiv (1 - \tau_{2,p,b}) y^b + H(g_{2,p,b}^b) = y^b$$

and it is immediate to verify that  $w_{1,b,p}^b = w_{2,p,b}^b = y^b$ .

<sup>80</sup>We are assuming that the participation constraint of the rich is not binding at  $\phi = 1$ ,

## 11.4 Proof of Result 1

In this Appendix we show that under the assumptions stated in the main text the following inequalities hold for all  $\phi$ :  $\tau^r < \tau_{1,b,r} < \tau_{1,b,p}$ . To this aim, we first prove that  $\tau^r < \tau_{1,b,r} \leq \tau^b$  by showing that  $\tau_{1,b,r} = \tau^r$  at  $\phi = 0$ ,  $\tau_{1,b,r} = \tau^b$  at  $\phi = 1$ , and that  $\tau_{1,b,r}$  is monotonically increasing in  $\phi$ . Next, we show that  $\tau^b < \tau_{1,b,p}$ .

At  $\phi = 0$  the rich are agenda setter with probability one at round 2, and they form the government coalition with the poor. If the income of the poor is equal to zero, the fiscal policy implemented at the second round corresponds to the dictatorial policy of the rich as the poor do not need to be compensated with a positive amount of their preferred public good. Thus, to form a government coalition at round 1, the middle class has to propose a policy to the rich such that their level of utility is the same they obtain at round 2. Given that the latter is equal to its global unconstrained maximum, the middle class can only implement the dictatorial policy of the rich, that is:  $\tau_{1,b,r} = \tau_{2,r,p} = \tau^r$ ,  $g_{1,b,r}^r = g_{2,r,p}^r = \tau^r \bar{y}$  and  $g_{1,b,r}^b = 0$ . In other words, the policy implemented (and the tax rate chosen) by the government coalition formed by the middle class and the rich at  $\phi = 0$  (if  $y^p = 0$ ) is the same as the one in majoritarian democracy.

We have previously shown that  $\tau_{1,b,r} = \tau^b$  for all values of  $\phi$  such that the participation constraint of the rich is not binding and that this is always the case at  $\phi = 1$  if  $y^p = 0$ .

To prove that  $\tau_{1,b,r}$  is monotonically increasing in  $\phi$ , consider the first order condition (17) for the maximization problem of the middle class in the government coalition with the rich when the participation constraint of the rich is binding, namely<sup>81</sup>

$$y^b = H_g(\tau_{1,b,r} \bar{y} - g_{1,b,r}^r) \left( \bar{y} - \frac{y^r}{H_g(g_{1,b,r}^r)} \right)$$

and differentiate it with respect to  $\phi$ . If we take into consideration the fact that from the participation constraint of the rich (14)  $g_{1,b,r}^r = g_{1,b,r}^r(\phi; \tau_{1,b,r}(\phi))$ , the differentiation of the first order condition implies that

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i.e. that  $\tau^b > \tau_{2,p,b}$ , because otherwise  $w_{1,b,r}^b$  would be at its global maximum (higher than  $y^b$ ). Moreover, notice that the policy considered has  $\tau_{1,b,r} \leq \tau_{2,p,b}$ , which implies that the participation constraint of the rich is not binding and allows the middle class to set  $g_{1,b,r}^r = 0$ ,  $g_{1,b,r}^b = \tau_{1,b,r} \bar{y}$ .

<sup>81</sup>We remind that  $\tau_{1,b,r} = \tau^b$  when the participation constraint is not binding.



$$\begin{aligned}
& H_{gg}(g_{1,b,r}^b) \left[ \frac{\partial \tau_{1,b,r}}{\partial \phi} \bar{y} - \frac{\partial g_{1,b,r}^r}{\partial \tau_{1,b,r}} \frac{\partial \tau_{1,b,r}}{\partial \phi} - \frac{\partial g_{1,b,r}^r}{\partial \phi} \right] \left[ \bar{y} - \frac{y^r}{H_g(g_{1,b,r}^r)} \right] + \\
& + H_g(g_{1,b,r}^b) \frac{y^r H_{gg}(g_{1,b,r}^r) \left[ \frac{\partial g_{1,b,r}^r}{\partial \tau_{1,b,r}} \frac{\partial \tau_{1,b,r}}{\partial \phi} + \frac{\partial g_{1,b,r}^r}{\partial \phi} \right]}{\left[ H_g(g_{1,b,r}^r) \right]^2} = 0.
\end{aligned}$$

From (14), we have that

$$\frac{\partial g_{1,b,r}^r}{\partial \tau_{1,b,r}} = \frac{y^r}{H_g(g_{1,b,r}^r)}$$

and substituting this expression in the previous equation gives us

$$\begin{aligned}
& \frac{\partial \tau_{1,b,r}}{\partial \phi} \left\{ H_{gg}(g_{1,b,r}^b) \left[ \bar{y} - \frac{y^r}{H_g(g_{1,b,r}^r)} \right]^2 + H_{gg}(g_{1,b,r}^r) \frac{(y^r)^2 H_g(g_{1,b,r}^b)}{\left[ H_g(g_{1,b,r}^r) \right]^3} \right\} + \\
& + \frac{\partial g_{1,b,r}^r}{\partial \phi} \left\{ -H_{gg}(g_{1,b,r}^b) \left[ \bar{y} - \frac{y^r}{H_g(g_{1,b,r}^r)} \right] + H_{gg}(g_{1,b,r}^r) \frac{y^r H_g(g_{1,b,r}^b)}{\left[ H_g(g_{1,b,r}^r) \right]^2} \right\} = 0.
\end{aligned} \tag{51}$$

Equation (51) allows us to determine the sign of  $\frac{\partial \tau_{1,b,r}}{\partial \phi}$ . Indeed, notice that the term in graph parenthesis that multiplies  $\frac{\partial \tau_{1,b,r}}{\partial \phi}$  is always negative and from (45) we know that  $\frac{\partial g_{1,b,r}^r}{\partial \phi} < 0$ . Therefore, the sign of the relationship between  $\tau_{1,b,r}$  and  $\phi$  depends on the sign of the term in the second graph parenthesis of (51) which multiplies  $\frac{\partial g_{1,b,r}^r}{\partial \phi}$ . In particular,  $\frac{\partial \tau_{1,b,r}}{\partial \phi} \geq 0$  if and only if

$$-H_{gg}(g_{1,b,r}^b) \left[ \bar{y} - \frac{y^r}{H_g(g_{1,b,r}^r)} \right] + H_{gg}(g_{1,b,r}^r) \frac{y^r H_g(g_{1,b,r}^b)}{\left[ H_g(g_{1,b,r}^r) \right]^2} \leq 0 \tag{52}$$

and vice versa.

Even though in general it is not possible to give a definite sign to the left hand side of (52), assuming a power function for the utility of the public good it turns out that inequality (52) is satisfied if

$$\frac{A(g_{1,b,r}^r)^\alpha}{\tau_{1,b,r}y^r} \leq \frac{1}{\alpha} \quad (53)$$

where the numerator of the left hand side of (53) is the utility that the rich get from their preferred public good provided and the denominator represents the taxes they pay. It is useful to rewrite inequality (53) as

$$A(g_{1,b,r}^r)^\alpha - \tau_{1,b,r}y^r \leq (1 - \alpha) A(g_{1,b,r}^r)^\alpha. \quad (54)$$

The participation constraint of the rich (14) can be rewritten as<sup>82</sup>

$$-\tau_{1,b,r}y^r + A(g_{1,b,r}^r)^\alpha = (1 - \phi) [-\tau_{2,r,p}y^r + A(g_{2,r,p}^r)^\alpha] - \phi\tau_{2,p,b}y^r \quad (55)$$

and substituting (55) into (54) leads to the following weak inequality

$$(1 - \phi) [-\tau_{2,r,p}y^r + A(g_{2,r,p}^r)^\alpha] - \phi\tau_{2,p,b}y^r - (1 - \alpha) A(g_{1,b,r}^r)^\alpha \leq 0. \quad (56)$$

Now, if we take into consideration the fact that the dictatorial policy of the rich is implemented at round 2 under the rich and poor coalition (see the discussion above), we are able to rewrite (56) as<sup>83</sup>

$$(1 - \phi) (1 - \alpha) \alpha^{\frac{\alpha}{1-\alpha}} A^{\frac{1}{1-\alpha}} \left( \frac{\bar{y}}{y^r} \right)^{\frac{\alpha}{1-\alpha}} - \phi\tau_{2,p,b}y^r - (1 - \alpha) A(g_{1,b,r}^r)^\alpha \leq 0. \quad (57)$$

Notice that only the first component of the left hand side of (57) is positive and this term decreases until zero as  $y^r$  increases.<sup>84</sup> Therefore, there exists

<sup>82</sup>We have used the power specification for  $H(\cdot)$  and subtracted  $y^r$  to both sides.

<sup>83</sup>We are using the fact that  $\tau_{2,r,p} = \tau^r$ ,  $g_{2,r,p}^r = \tau^r \bar{y}$  with  $\tau^r = \left( \frac{\alpha A \bar{y}^\alpha}{y^r} \right)^{\frac{1}{1-\alpha}}$ .

<sup>84</sup>The first component of (56) and (57) represents the net gain (with respect to the status quo) of the rich in utility terms when they are agenda setter at round 2 multiplied by  $(1 - \phi)$ . Clearly, this component goes to zero as  $\phi$  tends to one.

a  $y^r$  sufficiently high relatively to  $\bar{y}$  such that (57) is always satisfied, which in turn means that  $\frac{\partial \tau_{1,b,r}}{\partial \phi} \geq 0$ .<sup>85</sup>

At this point we know that  $\tau_{1,b,r}$  is monotonically increasing in  $\phi$ , that  $\tau_{1,b,r}(0) = \tau^r$  and that  $\tau_{1,b,r}(1) = \tau^b$  and this implies that  $\tau^r < \tau_{1,b,r} \leq \tau^b$ .

We now want to prove that  $\tau_{1,b,p}$  is always higher than  $\tau^b$  and to this aim we show that  $\tau_{1,b,p} = \tau^b$  at  $\phi = 0$  and that  $\tau_{1,b,p}$  is increasing in  $\phi$ . The first point is easily shown by observing that the middle class agenda setter in the coalition with the poor can implement her dictatorial policy ( $\tau_{1,b,p} = \tau^b$ ,  $g_{1,b,p}^b = \tau^b \bar{y}$  and  $g_{1,b,p}^p = 0$ ) at  $\phi = 0$  if  $y^p = 0$  because the participation constraint of the poor (18) is not binding. To prove the second point we take the first order condition (20) for the maximization problem of the middle class in the coalition with the poor

$$y^b = H_g(\tau_{1,b,p} \bar{y} - g_{1,b,p}^p) \left( \bar{y} - \frac{y^p}{H_g(g_{1,b,p}^p)} \right)$$

and we differentiate it with respect to  $\phi$ . From the participation constraint of the poor (18) we know that  $g_{1,b,p}^p = g_{1,b,p}^p(\phi; \tau_{1,b,p}(\phi))$ , which implies that the differentiation of the first order condition gives us

$$\begin{aligned} H_{gg}(g_{1,b,p}^b) \left[ \frac{\partial \tau_{1,b,p}}{\partial \phi} \bar{y} - \frac{\partial g_{1,b,p}^p}{\partial \tau_{1,b,p}} \frac{\partial \tau_{1,b,p}}{\partial \phi} - \frac{\partial g_{1,b,p}^p}{\partial \phi} \right] \left[ \bar{y} - \frac{y^p}{H_g(g_{1,b,p}^p)} \right] + \\ + H_g(g_{1,b,p}^b) \frac{y^p H_{gg}(g_{1,b,p}^p) \left[ \frac{\partial g_{1,b,p}^p}{\partial \tau_{1,b,p}} \frac{\partial \tau_{1,b,p}}{\partial \phi} + \frac{\partial g_{1,b,p}^p}{\partial \phi} \right]}{[H_g(g_{1,b,p}^p)]^2} = 0. \end{aligned}$$

Then, using the fact that  $\frac{\partial g_{1,b,p}^p}{\partial \tau_{1,b,p}} = \frac{y^p}{H_g(g_{1,b,p}^p)}$  and rearranging terms we get

$$\frac{\partial \tau_{1,b,p}}{\partial \phi} \left\{ H_{gg}(g_{1,b,p}^b) \left[ \bar{y} - \frac{y^p}{H_g(g_{1,b,p}^p)} \right] + H_{gg}(g_{1,b,p}^p) \frac{(y^p)^2 H_g(g_{1,b,p}^b)}{[H_g(g_{1,b,p}^p)]^3} \right\} +$$

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<sup>85</sup>Using the fact that the dictatorial policy of the rich is implemented at  $\phi = 0$  and therefore  $g_{1,b,r}^r(0) = \tau^r \bar{y}$ , it is immediate to verify that the left hand side of (57) is equal to zero at  $\phi = 0$ . Moreover, notice that the left hand side of (57) is more likely to be positive when  $\phi$  is small. In this case  $\tau_{1,b,r}$  would be decreasing in  $\phi$ . When  $y^r$  is not sufficiently high, the numerical simulations confirm that  $\tau_{1,b,r}$  is decreasing for values of  $\phi$  low and then it becomes increasing when  $\phi$  is big enough. See for example Figure 3.

$$+\frac{\partial g_{1,b,p}^p}{\partial \phi} \left\{ -H_{gg}(g_{1,b,p}^b) \left[ \bar{y} - \frac{y^p}{H_g(g_{1,b,p}^p)} \right] + H_{gg}(g_{1,b,p}^p) \frac{y^p H_g(g_{1,b,p}^b)}{[H_g(g_{1,b,p}^p)]^2} \right\} = 0. \quad (58)$$

From the differentiation of the participation constraint for the poor (18) we know that  $\frac{\partial g_{1,b,p}^p}{\partial \phi} > 0$  (see (47)) and therefore the sign of  $\frac{\partial \tau_{1,b,p}}{\partial \phi}$  depends on the sign of the term in the second graph parenthesis of (58) that multiplies  $\frac{\partial g_{1,b,p}^p}{\partial \phi}$ . If

$$-H_{gg}(g_{1,b,p}^b) \left[ \bar{y} - \frac{y^p}{H_g(g_{1,b,p}^p)} \right] + H_{gg}(g_{1,b,p}^p) \frac{y^p H_g(g_{1,b,p}^b)}{[H_g(g_{1,b,p}^p)]^2} > 0 \quad (59)$$

then  $\frac{\partial \tau_{1,b,p}}{\partial \phi} > 0$ , and vice versa. In this case we don't need to use a power function specification for  $H(\cdot)$  because using the fact that  $y^p = 0$  and  $g_{1,b,p}^p > 0$  for all  $\phi > 0$ , inequality (59) becomes

$$-H_{gg}(g_{1,b,p}^b) \bar{y} > 0 \quad (60)$$

which is always satisfied given that  $H_{gg}(\cdot) < 0$ .<sup>86</sup> This implies that  $\tau_{1,b,p}$  is monotonically increasing in  $\phi$  and its minimum level is equal to  $\tau^b$  at  $\phi = 0$ .

## 11.5 Mean Preserving Spread 2

In this Appendix we show that it is possible to obtain a sufficient condition for  $w_{1,b,r}^b$  to be increasing (and therefore  $\phi^*$  decreasing) in  $y^r$ . This is the case if the increase in the income of the rich leads to a reduction in the amount of the public good  $g_{1,b,r}^r$  that the middle class needs to provide to the rich to satisfy her participation constraint assuming constant the initial taxation  $\tau_{1,b,r}$ . Differentiating the participation constraint for the rich (14), which we assume to be binding,<sup>87</sup> with respect to  $y^r$ , we get<sup>88</sup>

<sup>86</sup>If we assume a power function for the utility of the public good, then inequality (59) is satisfied whenever  $A(g_{1,b,p}^p)^\alpha > \frac{\tau_{1,b,p} y^p}{\alpha}$ , where the left hand side represents the utility that the poor get from the public good and the right hand side is the ratio between the taxes they pay and  $\alpha$ . Clearly, this inequality is always satisfied if  $y^p = 0$  because the right hand side is equal to zero while the left hand side is strictly positive for all  $\phi > 0$ . At  $\phi = 0$  it is immediate to verify that  $\frac{\partial \tau_{1,b,p}}{\partial \phi} = 0$ .

<sup>87</sup>This means that it holds with strict equality in equilibrium. If the constraint (14) is not binding, the policy implemented by the middle class corresponds to her preferred policy, which does not depend on the income of the rich.

<sup>88</sup>We use the fact that

$$\frac{\partial H(g_{1,b,r}^r)}{\partial y^r} = \tau_{1,b,r} - [(1 - \phi) \tau_{2,r,p} + \phi \tau_{2,p,b}] \quad (61)$$

and therefore  $\frac{\partial H(g_{1,b,r}^r)}{\partial y^r} < 0$  if

$$\tau_{1,b,r} < (1 - \phi) \tau_{2,r,p} + \phi \tau_{2,p,b} \equiv E(\tau_2).$$

That is, an increase in the income of the rich leads to an increase in  $w_{1,b,r}^b$  if the expected tax rate at round 2 is higher than the tax rate at round 1. Indeed, in this case an increase in  $y^r$  weakens the bargaining position of the rich at round 1 by making more costly for them to turn down any policy coalition proposal formulated by the middle class agenda setter.

We have previously demonstrated that the schedules  $w_{1,b,p}^b(\phi)$  and  $w_{1,b,r}^b(\phi)$  are decreasing and increasing in  $\phi$  respectively. Given that  $w_{1,b,p}^b(\phi)$  is not affected by this mean preserving spread while  $w_{1,b,r}^b(\phi)$  shifts upward, it turns out that the threshold  $\phi^*$  goes down. Therefore, we conclude that the increase in income inequality leads to a reduction of the range  $(0, \phi^*)$  where the consensual democracy is chosen and this means that it is more likely the adoption of a majoritarian constitution.

## 11.6 Majoritarian Democracy Equilibrium with General and Specific Public Goods

In this Appendix we show that *in majoritarian democracy, only middle class citizen-candidates run for office if  $\theta \in [0, \theta^*]$  and only rich citizen-candidates run for office when  $\theta \in [\theta^*, 1]$* . The proof of this result is similar to that of Proposition 1.

We first determine the dictatorial policy of each social group  $j \in \mathfrak{S} \equiv \{p, b, r\}$ , which is the solution of the following problem

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$$\begin{aligned} \frac{d[(1 - \tau_{2,r,p})y^r + H(\tau_{2,r,p}\bar{y} - g_{2,r,p}^p(\tau_{2,r,p}; y^b))]}{dy^r} &= \frac{dw_{2,r,p}^r}{dy^r} = \\ &= \frac{\partial w_{2,r,p}^r}{\partial \tau_{2,r,p}} \frac{\partial \tau_{2,r,p}}{\partial y^r} + \frac{\partial w_{2,r,p}^r}{\partial y^r} = 1 - \tau_{2,r,p} \end{aligned}$$

since  $\frac{\partial w_{2,r,p}^r}{\partial \tau_{2,r,p}} = 0$  around  $\tau_{2,r,p}$  by the envelope theorem.

$$\max_{\{\tau^j, g^j, q^j\}} w^j = (1 - \tau^j)y^j + \theta(g^j)^\alpha + (1 - \theta)(q^j)^\alpha$$

subject to the equilibrium government budget constraint

$$\tau^j \bar{y} = g^j + q^j$$

where  $q^j$  is the level of the general public good preferred by the agents of group  $j$ . This maximization problem can be rewritten as

$$\max_{\{\tau^j, g^j\}} w^j = (1 - \tau^j)y^j + \theta(g^j)^\alpha + (1 - \theta)(\tau^j \bar{y} - g^j)^\alpha.$$

The solution of this problem implies that

$$q^j = \left[ \frac{\alpha(1 - \theta)\bar{y}}{y^j} \right]^{\frac{1}{1-\alpha}}$$

and

$$g^j = \left( \frac{\alpha\theta\bar{y}}{y^j} \right)^{\frac{1}{1-\alpha}}$$

which in turn means that

$$\tau^j = \alpha^{\frac{1}{1-\alpha}} (\bar{y})^{\frac{\alpha}{1-\alpha}} (y^j)^{-\frac{1}{1-\alpha}} \left[ \theta^{\frac{1}{1-\alpha}} + (1 - \theta)^{\frac{1}{1-\alpha}} \right]. \quad (62)$$

It is immediate to verify that

$$\frac{\partial \tau^j}{\partial y^j} < 0$$

for all values of  $\theta$  and therefore the dictatorial tax rates are ordered as in the baseline model (see the expression (6)):  $\tau^r < \tau^b < \tau^p$ . Moreover, it is easy to show that the share of tax revenues spent in the group specific public good depends positively on  $\theta$ :  $\frac{\partial(g^j/\tau^j \bar{y})}{\partial \theta} > 0$ . Finally,  $\frac{\partial \tau^j}{\partial \theta} \gtrless 0$  depending on  $\theta \gtrless \frac{1}{2}$ .

Again notice that, similarly to Proposition 1, there is no equilibrium such that (at least) a candidate from each group runs for office because the middle class candidate would win the election with certainty and, therefore neither a poor nor a rich candidate would run against him. We now determine who the winner is when there are citizen candidates of the following classes: (i) rich and middle class; (ii) rich and poor; (iii) middle class and poor.

**Case (i).** If rich and middle class individuals run for office, the winner is determined by the vote of the poor. The utility of the poor if the winner is a rich (and therefore their dictatorial policy is implemented) is given by

$$w^{p,r} = (1 - \tau^r)y^p + (1 - \theta) \left[ \frac{\alpha(1 - \theta)\bar{y}}{y^r} \right]^{\frac{\alpha}{1-\alpha}}$$

and when the winner is a citizen-candidate from the middle class

$$w^{p,b} = (1 - \tau^b)y^p + (1 - \theta) \left[ \frac{\alpha(1 - \theta)\bar{y}}{y^b} \right]^{\frac{\alpha}{1-\alpha}}$$

where  $\tau^r$  and  $\tau^b$  are the dictatorial tax rates as defined by the expression (62).

One can easily verify that at  $\theta = 0$  the poor prefer the middle class to the rich because  $w^{p,b}(0) > w^{p,r}(0)$ , while the opposite is true at  $\theta = 1$  where  $w^{p,b}(1) < w^{p,r}(1)$ . Indeed,

$$w^{p,r}(0) = y^p + \alpha^{\frac{1}{1-\alpha}}(\bar{y})^{\frac{\alpha}{1-\alpha}} \frac{y^r - \alpha y^p}{(y^r)^{\frac{1}{1-\alpha}}}$$

and

$$w^{p,b}(0) = y^p + \alpha^{\frac{1}{1-\alpha}}(\bar{y})^{\frac{\alpha}{1-\alpha}} \frac{y^b - \alpha y^p}{(y^b)^{\frac{1}{1-\alpha}}}.$$

It is immediate that  $w^{p,b}(0) > w^{p,r}(0)$  if

$$\frac{y^b - \alpha y^p}{(y^b)^{\frac{1}{1-\alpha}}} > \frac{y^r - \alpha y^p}{(y^r)^{\frac{1}{1-\alpha}}}. \quad (63)$$

Define

$$f(y) = \frac{y - \alpha y^p}{y^{\frac{1}{1-\alpha}}}$$

and differentiate it with respect to  $y$ . We obtain that

$$f'(y) = \frac{\alpha(y^p - y)}{(1 - \alpha)y^{\frac{2-\alpha}{1-\alpha}}}$$

which implies that  $f'(y) < 0$  whenever  $y^p < y$ . This implies that the inequality in (63) always holds given that  $y$  can be equal to  $y^b$  and  $y^r$  that are both greater than  $y^p$ .<sup>89</sup>

The intuition for this result is straightforward. When  $\theta = 0$  all tax revenues are spent in the general public good and the poor prefer the middle class to the rich because the amount of public good provided by the middle class is closer to their preferred level. Conversely, when  $\theta = 1$  we are in our baseline model where all government revenues are spent in the specific public good of the winner, and therefore the poor prefer the group that taxes less, i.e. the rich.

We now show that there exists a  $\theta^* \in (0, 1)$  such that  $w^{p,b}(\theta^*) = w^{p,r}(\theta^*)$ . Clearly, what we have shown above implies that  $w^{p,b}(\theta) > w^{p,r}(\theta)$  if  $\theta \in [0, \theta^*)$ , and  $w^{p,b}(\theta) < w^{p,r}(\theta)$  when  $\theta \in (\theta^*, 1]$ . With some algebra we find that  $\theta^*$  is implicitly defined by the following equation<sup>90</sup>

$$\left( \frac{\theta^*}{1 - \theta^*} \right)^{\frac{1}{1-\alpha}} = \frac{(y^b)^{\frac{\alpha}{\alpha-1}} - (y^r)^{\frac{\alpha}{\alpha-1}}}{\alpha y^p \left[ (y^b)^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}} \right]} - 1. \quad (64)$$

Therefore, the poor prefer the middle class when  $\theta \in [0, \theta^*)$ , they prefer the rich if  $\theta \in (\theta^*, 1]$  and they are indifferent at  $\theta = \theta^*$ .

**Case (ii).** The winner between a rich and a poor citizen-candidate is determined by the vote of the middle class, whose utility is given by

$$w^{b,r} = (1 - \tau^r)y^b + (1 - \theta) \left[ \frac{\alpha(1 - \theta)\bar{y}}{y^r} \right]^{\frac{\alpha}{1-\alpha}}$$

<sup>89</sup> Another way to prove that  $w^{p,b}(0) > w^{p,r}(0)$  is to notice that the utility of the poor is strictly increasing in  $\tau$  until  $\tau < \tau^p$  when there is the general public good only. Given that  $\tau^r < \tau^b < \tau^p$  our result follows.

<sup>90</sup> The value of  $\theta^*$  depends on the income distribution  $(y^p, y^b, y^r)$  and the utility function  $(\alpha)$ . Moreover, it is negatively related to  $y^p$ .



when the winner is the rich, and it is

$$w^{b,p} = (1 - \tau^p)y^b + (1 - \theta) \left[ \frac{\alpha(1 - \theta)\bar{y}}{y^p} \right]^{\frac{\alpha}{1-\alpha}}$$

if the winner is the poor.

From our baseline model, we already know that when  $\theta = 1$  the middle class prefers the rich to the poor as  $w^{b,p}(1) < w^{b,r}(1)$ . We cannot state in this case that the middle class always prefers the poor to the rich when  $\theta = 0$  because this depends on the incomes of the three groups and the value of  $\alpha$ .

We now determine (if it exists) the value of  $\theta^{**} \in [0, 1]$  such that  $w^{b,p}(\theta^{**}) = w^{b,r}(\theta^{**})$ . Assuming that it exists, after some algebra one can find that  $\theta^{**}$  is implicitly defined by the following expression

$$\left( \frac{\theta^{**}}{1 - \theta^{**}} \right)^{\frac{1}{1-\alpha}} = \frac{(y^p)^{\frac{\alpha}{\alpha-1}} - (y^r)^{\frac{\alpha}{\alpha-1}}}{\alpha y^b \left[ (y^p)^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}} \right]} - 1. \quad (65)$$

If  $\theta^{**}$  does not exist, then  $w^{b,p}$  is always lower than  $w^{b,r}$  and the middle class always prefers the rich to the poor (i.e. for all  $\theta \in [0, 1]$ ). If  $\theta^{**} > 0$ , this means that  $w^{b,p}(\theta) > w^{b,r}(\theta)$  when  $\theta \in [0, \theta^{**})$ , and  $w^{b,p}(\theta) < w^{b,r}(\theta)$  when  $\theta \in (\theta^{**}, 1]$ . In other words, the middle class votes for the poor when the taste for the general public good is sufficiently high and for the rich when this taste is low. The intuition for this result is the following: the fiscal policy decided by the rich is characterized by low taxation and low provision of the general public good, while the policy of the poor involves a higher tax rate and higher provision of the general public good. The policy of the poor may be preferred to the policy of the rich only when the taste of individuals for the general public good is sufficiently high ( $\theta$  low) because in this case the poor spend a greater fraction of the tax revenues in the general public good and, on the other hand, the middle class agents derive a high utility from the general public good provision. Hence, the higher utility derived by the middle class from the provision of the general public good may more than compensate their disutility for the higher taxation.

It is possible to show that  $\theta^{**} < \theta^*$ . Indeed, this is true if the following inequality is satisfied

$$\frac{(y^b)^{\frac{\alpha}{\alpha-1}} - (y^r)^{\frac{\alpha}{\alpha-1}}}{\alpha y^p \left[ (y^b)^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}} \right]} > \frac{(y^p)^{\frac{\alpha}{\alpha-1}} - (y^r)^{\frac{\alpha}{\alpha-1}}}{\alpha y^b \left[ (y^p)^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}} \right]}$$

which can be rewritten as

$$\frac{y^b \left[ (y^b)^{\frac{\alpha}{\alpha-1}} - (y^r)^{\frac{\alpha}{\alpha-1}} \right]}{(y^b)^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}}} > \frac{y^p \left[ (y^p)^{\frac{\alpha}{\alpha-1}} - (y^r)^{\frac{\alpha}{\alpha-1}} \right]}{(y^p)^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}}}.$$

Given that  $y^b > y^p$ , the above inequality holds if the function

$$g(y) = \frac{y \left[ y^{\frac{\alpha}{\alpha-1}} - (y^r)^{\frac{\alpha}{\alpha-1}} \right]}{y^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}}}$$

is increasing in  $y$ . After some algebra, we find that the derivative of  $g(\cdot)$  with respect  $y$  is

$$g'(y) = \frac{2y^{-\frac{1+\alpha}{1-\alpha}} + (y^r)^{-\frac{1+\alpha}{1-\alpha}} + \frac{2\alpha-1}{1-\alpha} y^{-\frac{\alpha}{1-\alpha}} (y^r)^{-\frac{1}{1-\alpha}} + \frac{2\alpha-1}{1-\alpha} y^{-\frac{1}{1-\alpha}} (y^r)^{-\frac{\alpha}{1-\alpha}}}{\left[ y^{\frac{1}{\alpha-1}} - (y^r)^{\frac{1}{\alpha-1}} \right]^2}$$

which is always positive given that  $y$  (which can be equal to  $y^p$  and  $y^b$ ) is always lower than  $y^r$ .

**Case (iii).** In the competition between a middle class and a poor citizen-candidate, the rich would always vote for the middle class candidate, which therefore turns out to be the winner.

Indeed, we can first easily verify that the rich prefer the middle class to the poor if  $\theta = 0$ , i.e. that  $w^{r,b}(0) > w^{r,p}(0)$ , by observing that the utility of the rich is strictly decreasing in  $\tau$  when  $\tau > \tau^r$  and that  $\tau^r < \tau^b < \tau^p$ .

Second, the utility of the rich when the middle class dictatorial policy is implemented reads

$$w^{r,b} = (1 - \tau^b)y^r + (1 - \theta) \left[ \frac{\alpha(1 - \theta)\bar{y}}{y^b} \right]^{\frac{\alpha}{1-\alpha}} \quad (66)$$

and it reads instead

$$w^{r,p} = (1 - \tau^p)y^r + (1 - \theta) \left[ \frac{\alpha(1 - \theta)\bar{y}}{y^p} \right]^{\frac{\alpha}{1-\alpha}} \quad (67)$$

under the dictatorial policy of the poor. Substituting  $\tau^r$  and  $\tau^b$  as defined by (62) into (66) and (67), we get that  $w^{r,b}(\theta) > w^{r,p}(\theta)$  if and only if the following inequality holds

$$\left(\frac{\theta}{1-\theta}\right)^{\frac{1}{1-\alpha}} > \frac{(y^p)^{\frac{\alpha}{\alpha-1}} - (y^b)^{\frac{\alpha}{\alpha-1}}}{\alpha y^r \left[(y^p)^{\frac{1}{\alpha-1}} - (y^b)^{\frac{1}{\alpha-1}}\right]} - 1. \quad (68)$$

Notice that the left hand side is increasing in  $\theta$  while the right hand side is constant. This means that (68) is satisfied for all values of  $\theta \in [0, 1]$  if it is satisfied at  $\theta = 0$ . But, we have already shown that this is true because  $w^{r,b} > w^{r,p}$  at  $\theta = 0$ . Hence, we have obtained that the rich always prefer the middle class citizen-candidate to the poor one.

By combining the above results, we can easily show that only middle class citizen-candidates run for office if  $\theta \in [0, \theta^*]$ , and only rich citizen-candidates run for office when  $\theta \in [\theta^*, 1]$ . The proof is the following. We have shown above that it cannot be the case that a citizen-candidate from all three groups runs for office, and from (iii) that it is not an equilibrium the situation where there is a citizen-candidate from the middle class and the poor because the rich always vote for the middle class, so that the poor will not run for office in this case. Now, assuming that  $\theta^{**} > 0$  we have that the parameter space is partitioned into three regions:  $\theta \in [0, \theta^{**}]$ ,  $\theta \in [\theta^{**}, \theta^*]$  and  $\theta \in [\theta^*, 1]$ .<sup>91</sup>

First consider the case where  $\theta \in [\theta^*, 1]$ . From (i) we know that the rich citizen-candidate wins against the middle class candidate and from (ii) that he also wins against the poor. Therefore, the equilibrium is such that only the rich citizen-candidate runs for office.

Then, assume that  $\theta \in [\theta^{**}, \theta^*]$ . In this case the only equilibrium is the one where there are candidates from the middle class. Indeed, from (i) and (iii) the middle class wins against the rich and poor respectively. This is also what happens when  $\theta \in [0, \theta^{**}]$ . The only difference comes from (ii): the rich win against the poor when  $\theta \in [\theta^{**}, \theta^*]$  and loose when  $\theta \in [0, \theta^{**}]$ . However, this is not important because the rich and the poor never run for office if  $\theta < \theta^*$ .

Summarizing, we have shown that the winner is always a rich citizen-candidate if  $\theta \in [0, \theta^*]$ , while he is from the middle class when  $\theta \in [\theta^*, 1]$ . Similarly to the case where there are specific public goods only, the number

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<sup>91</sup>If a rich citizen-candidate always wins against a poor one, the proof goes along the same lines and we have two regions:  $\theta \in [0, \theta^*]$  and  $\theta \in [\theta^*, 1]$ .

of citizen candidates running for office will be such that in equilibrium, individuals are indifferent between running and not running.

### 11.7 Consensual Democracy Equilibrium with General and Specific Public Goods

In this Appendix we show that *the partial political equilibrium in consensual democracy is the same as that of the baseline version of the model for any value of  $\theta$ . In other words, for any given  $\theta$ , there exists a threshold value  $\phi^* \in (0, 1)$  such that the government coalition is made by the middle class and the poor if  $\phi < \phi^*$ , while it is made by the middle class and the rich when  $\phi > \phi^*$ .*

By a straightforward envelope theorem argument, the utility of the middle class when she forms a coalition with the poor (the rich) at round 1 is strictly decreasing (increasing) in  $\phi$ . Moreover, it is immediate (see the Proof of Proposition 2 and the arguments relative to the endpoints values of the schedules  $w_{1,b,p}^b(\phi)$  and  $w_{1,b,r}^r(\phi)$ , which can be easily adapted) to deduce that they do cross each other once over the range  $(0, 1)$  at some  $\phi = \phi^*$ .

### 11.8 General Political Equilibrium with General and Specific Public Goods

We first show that *the poor prefer the consensual constitution (which is therefore chosen by the society) if they are part of the government coalition ( $\phi < \phi^*$ ) when  $\theta \in [\theta^*, 1]$ .* The proof is based on the fact that the middle class policy proposal at round 1 has to provide to the poor a level of utility at least equal to their expected utility at round 2. It can be easily shown that this expected utility of the poor is greater than their utility in majoritarian democracy. Indeed, at round 2 the poor are agenda setter with a probability  $\phi$  and with the complementary probability  $(1 - \phi)$  they are part of the government coalition with the rich.<sup>92</sup> In the first case their utility is higher than in majoritarian democracy and it is at least as high as in the majoritarian constitution in the second case. Then, it follows that the expected utility of the poor at the second round (and therefore the utility at round 1 in the coalition with the middle class) is higher than the utility in majoritarian democracy.

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<sup>92</sup>It is immediate to verify that also in this case the poor are the cheaper to buy at round 2.

When the poor are not part of the government coalition ( $\phi > \phi^*$ ) they should prefer the majoritarian democracy. Indeed, the equilibrium in consensual democracy under a middle class and rich coalition when  $\theta \in [\theta^*, 1]$  should imply that a great part of the government revenues are spent in the group specific public goods preferred by the middle class and the rich and only a small amount of the general public good is provided because the taste of the individuals for the specific public good is high and for the general one is low. Therefore, given that all the policy variables are continuous functions of  $\theta$ , we expect the characteristics of the equilibrium not to be different from the baseline model with the poor preferring the majoritarian constitution. Finally notice that even though we cannot exclude the possibility that the policy of the middle class and rich coalition gives to the poor a higher utility than the policy in majoritarian democracy when  $\phi$  is (greater but) not too far from  $\phi^*$ , we can confidently state that there is a  $\phi^* \leq \bar{\phi} < 1$  such that the utility of the poor when  $\phi > \bar{\phi}$  is higher in majoritarian democracy. This is so because of the fact that the policy of the middle class and rich coalition converges to the dictatorial policy of the middle class as  $\phi$  tends to 1, but we know that the poor prefer the dictatorial policy of the rich (majoritarian democracy) to that of the middle class.

When the taste for the general public is sufficiently strong,  $\theta \in [0, \theta^*]$ , the results of our baseline framework do not hold anymore and the society should always choose the majoritarian democracy. Indeed, we have shown that the winner is a middle class member if we are in majoritarian democracy. In consensual democracy, for any given level of  $\theta$ , there exists a  $\phi^*$  such that the middle class makes the government coalition with the poor when  $\phi < \phi^*$  and with the rich if  $\phi > \phi^*$ . Given that the middle class can implement her dictatorial policy in majoritarian democracy she will always prefer it unconditionally. This means that the consensual democracy is chosen by society if and only if both the rich and the poor prefer this constitution to the dictatorship of the middle class (that arise in the majoritarian system). Even though we do not have a formal proof, we can confidently state that this situation is very unlikely.

It is possible to show formally and very easily that the majoritarian democracy is always chosen by society in the special case where there is the general public good only ( $\theta = 0$ ). In this instance, the tax rate is the only policy decision variable and the dictatorial policies of the three groups are again ordered as follows:  $\tau^r < \tau^b < \tau^p$ . The tax rate of the government coalition made by the middle class and rich turns out to be a convex combination of  $\tau^b$  and  $\tau^r$ , while the tax rate of the middle class

and poor is a convex combination of  $\tau^b$  and  $\tau^p$ . Hence, when  $\phi < \phi^*$  the government coalition is made by the middle class and poor, and the rich prefer the dictatorial policy of the middle class because it involves a lower tax rate. Therefore, the rich and the middle class vote for the majoritarian constitution, which will be implemented. On the other hand, when  $\phi > \phi^*$  the government coalition is made by the middle class and rich. In this case, the poor prefer the dictatorial policy of the middle class because it implies a higher level of taxation and provision of the general public good. Hence, in this case the majoritarian constitution is chosen as the poor and the middle class vote for it.

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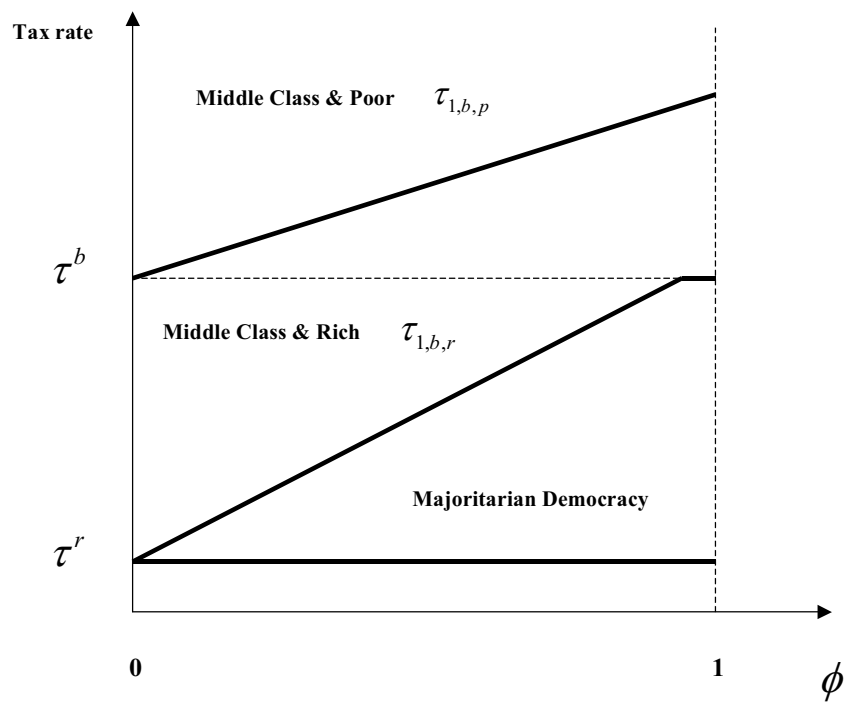


Figure 1: Taxation across constitutions and coalitions when  $y^p = 0$  and  $y^r$  is high relative to  $\bar{y}$ .

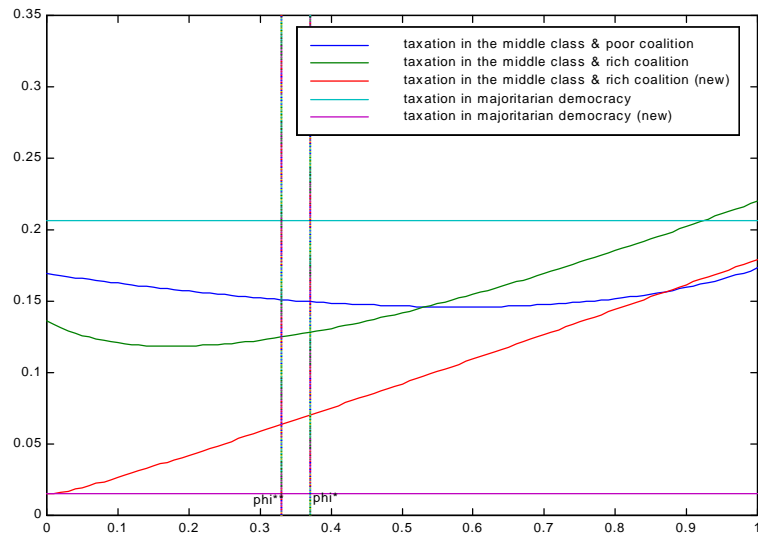


Figure 2:

Taxation with  $y^p = 0.9$ ,  $y^b = 0.95$ ,  $\bar{y} = 1$ ,  $y^r = 1.1$ . The schedules with (new) refer to  $y^r = 4$ .

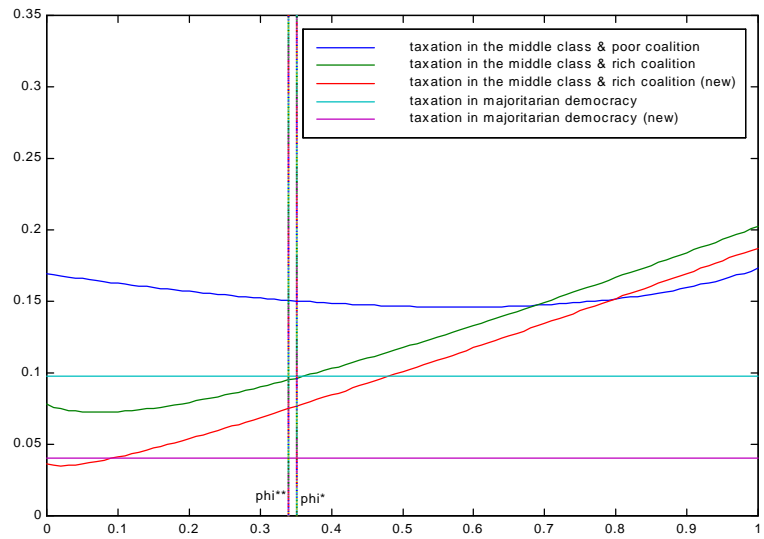


Figure 3:

Taxation with  $y^p = 0.9$ ,  $y^b = 0.95$ ,  $\bar{y} = 1$ ,  $y^r = 1.6$ . The schedules with (new) refer to  $y^r = 2.5$ .

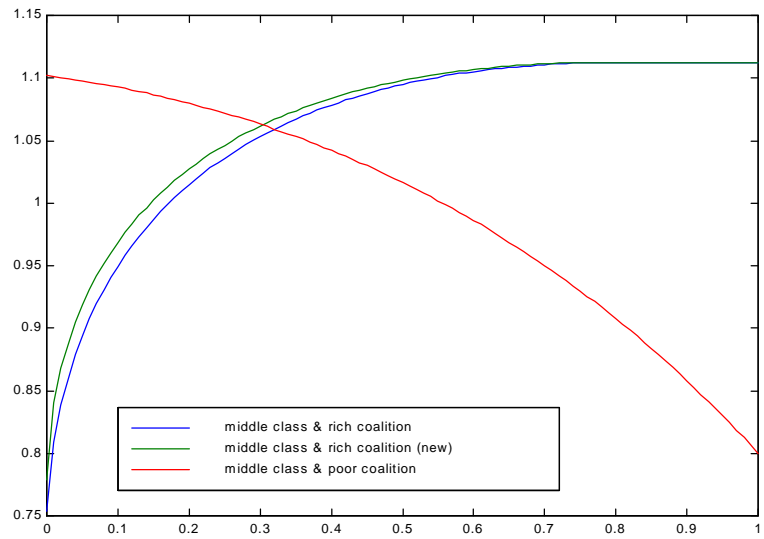


Figure 4:

Utility of the middle class across coalitions with  $y^p = 0.3$ ,  $y^b = 0.8$ ,  $\bar{y} = 1$ ,  $y^r = 1.6$ . The schedule with (new) refers to  $y^r = 2.4$ .

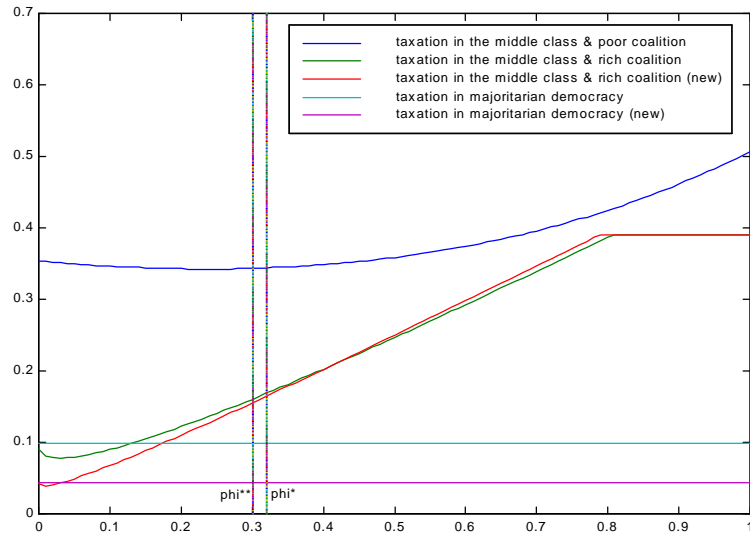


Figure 5:

Taxation with  $y^p = 0.3$ ,  $y^b = 0.8$ ,  $\bar{y} = 1$ ,  $y^r = 1.6$ . The schedules with (new) refer to  $y^r = 2.4$ .



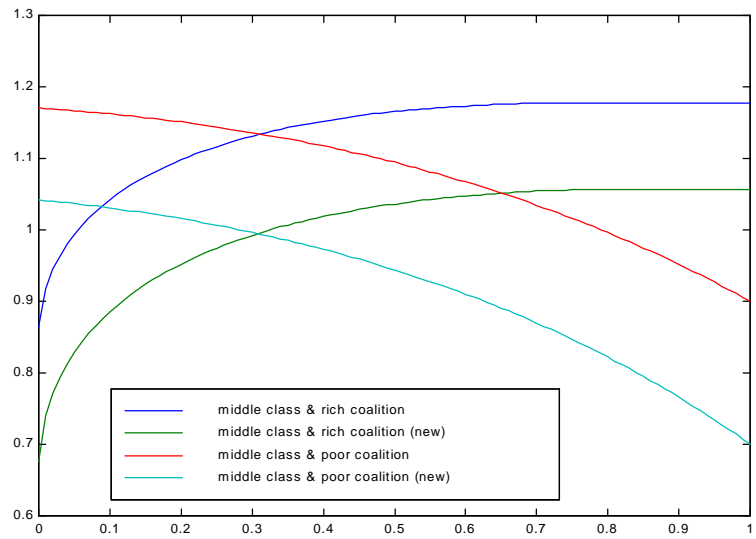


Figure 6:

Utility of the middle class across coalitions with  $y^p = 0.3$ ,  $y^b = 0.9$ ,  $\bar{y} = 1$ ,  $y^r = 2$ . The schedules with (new) refer to  $y^b = 0.7$ .

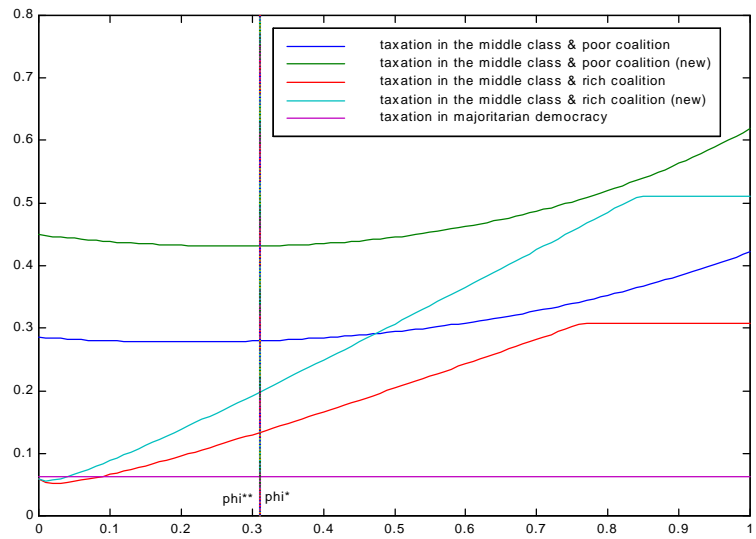


Figure 7:

Taxation with  $y^p = 0.3$ ,  $y^b = 0.9$ ,  $\bar{y} = 1$ ,  $y^r = 2$ . The schedules with (new) refer to  $y^b = 0.7$ .

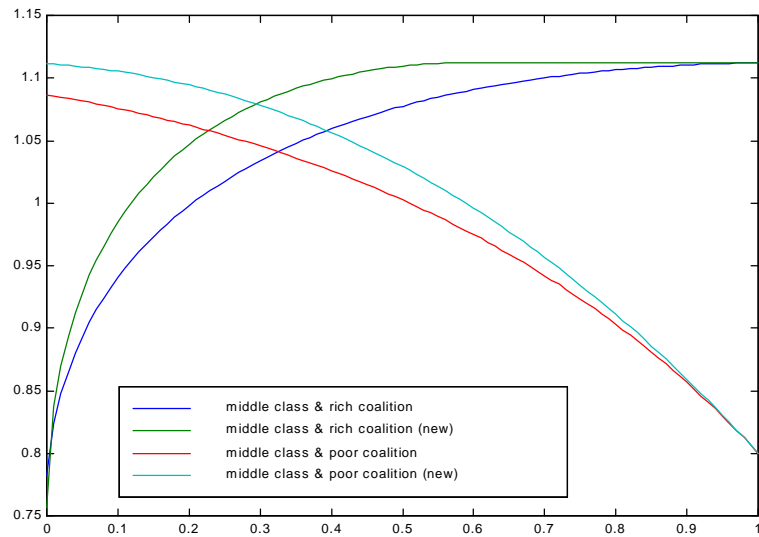


Figure 8:

Utility of the middle class across coalitions with  $y^p = 0.5$ ,  $y^b = 0.8$ ,  $\bar{y} = 1$ ,  $y^r = 2$ . The schedules with (new) refer to  $y^p = 0.1$ .

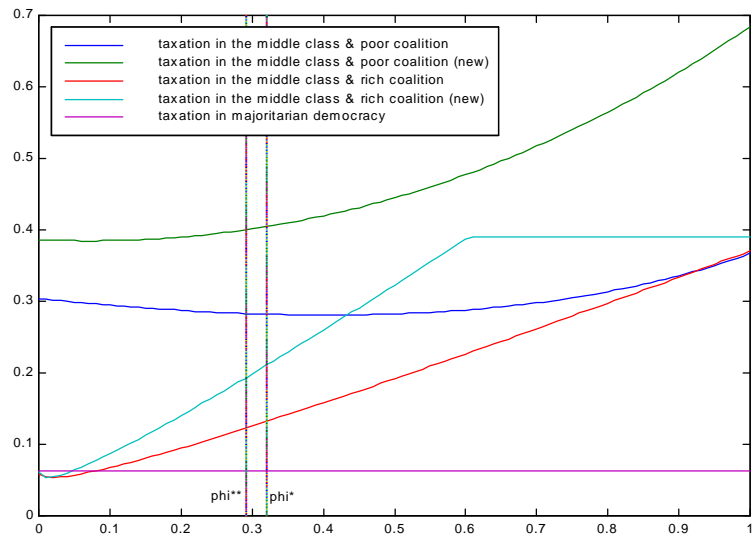


Figure 9:

Taxation with  $y^p = 0.5$ ,  $y^b = 0.8$ ,  $\bar{y} = 1$ ,  $y^r = 2$ . The schedules with (new) refer to  $y^p = 0.1$ .

	1950-59	1960-69	1970-79	1980-91	Average 1950-1991
Australia	4.00	4.00	3.40	2.50	3.475
Canada	3.30	3.30	3.10	3.67	3.3425
U.K.	3.80	2.80	3.00	4.00	3.4
U.S.A.	3.70	3.20	3.70	3.92	3.63
France	3.80	4.00	3.84	2.83	3.6175
Austria	2.53	2.66	2.00	2.37	2.39
Belgium	2.78	2.76	3.00	3.16	2.925
Denmark	2.62	2.46	2.63	3.40	2.7775
Finland	2.67	2.63	2.47	2.68	2.6125
Germany	4.01	3.34	2.25	3.83	3.3575
Italy	3.05	2.88	2.92	2.76	2.9025
Norway	2.00	2.77	2.24	2.63	2.41
Netherlands	2.73	3.12	2.95	3.14	2.985
Sweden	2.16	2.00	2.51	2.22	2.2225
Switzerland	3.89	3.43	3.43	3.43	3.545

Table 1: Cusack Index of Government Partisanship.

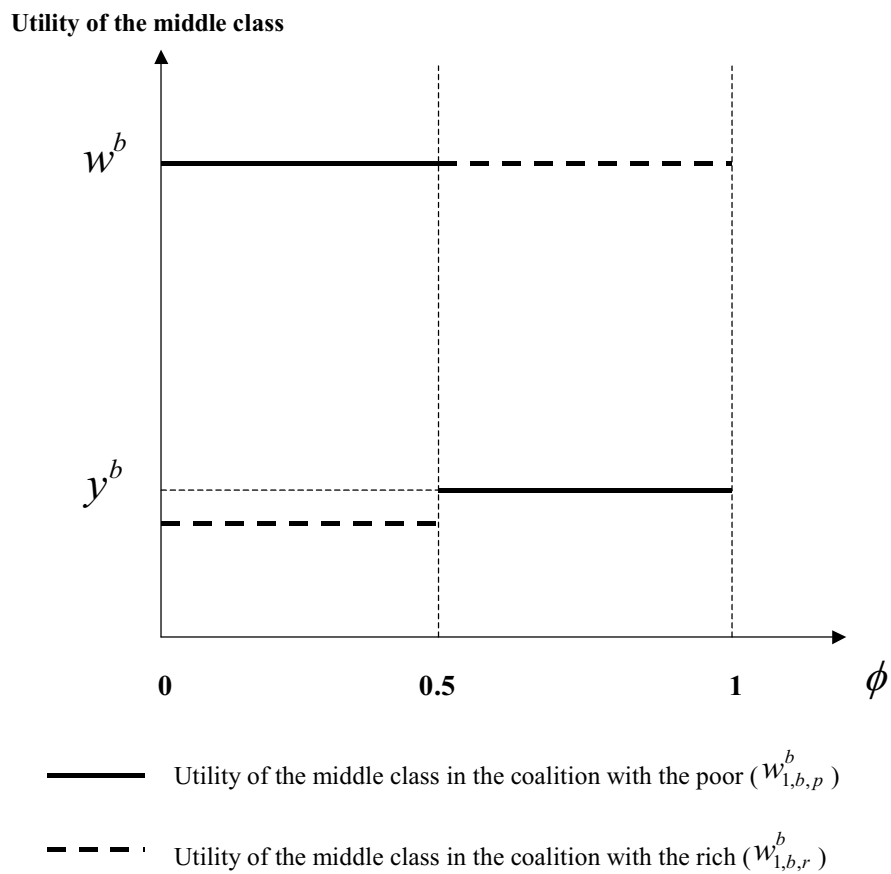


Figure 10: Utility of the middle class with a deterministic agenda setter when the income of the poor is equal to zero.

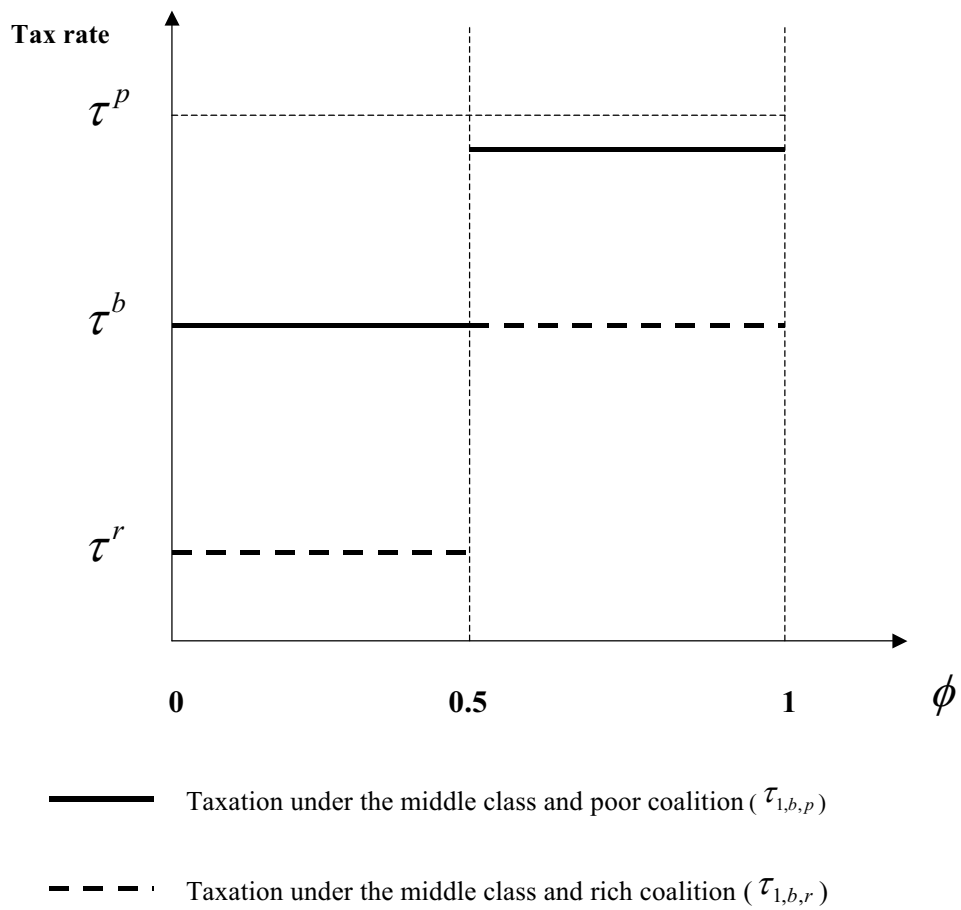


Figure 11: Taxation across coalitions with a deterministic agenda setter when the income of the poor is equal to zero.

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