Democratization and Endogenous Constitutions

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Abstract

This paper investigates the determinants of the political institutions emerging from the process of democratization. We provide a novel theory of endogenous democratization to study how the constitution, both in terms of form of state as well as electoral rules, depends on the level of inequality at the moment of the democratic transition. The constitutional details, in turn, affect the level taxation and redistribution, the path of development and the dynamic evolution of economic inequality. The model delivers a series of theoretical predictions, which, together with the main assumptions, are tested using the available cross country data.

1 Introduction

Political institutions affect policies, and policies affect economic outcomes. This begs the question of why are political institutions so different across the world. In this paper, we provide a novel theory about the endogenous determination of political institutions in a dynamic perspective. We investigate how the process of democratization, and the economic conditions prevailing during the transition towards democracy, may affect the democratic structures in terms of the constitutional details. By determining policies, the political institutions in turn affect the pattern of development and the dynamic evolution of inequality of economies after democratization.

We provide a model of the endogenous emergence of political institutions and the design of the constitution during the process of democratization. The main mechanism explaining endogenous democratization in this paper is based on the idea that economic development is hampered by commitment problems inherent in oligarchic structures. The idea that the elite extends the franchise since democratization allows to alleviate credibility problems follows the recent literature initiated by Acemoglu, Johnson and Robinson.[1] In our model, democratization takes place only when the efficiency costs associated to oligarchies are large enough to induce the oligarchic elite to extend the franchise. This idea is similar to contributions by Bourguignon and Verdier (2000), Gradstein (2004b), Lizzeri and Persico (2004), or Llavador and Oxoby (2005) in which democratization can be in the elite's own interest. In particular we consider the case in which, in oligarchies, the elite cannot commit not to expropriate the disenfranchised. Therefore oligarchic elites forego economic opportunities by discouraging economic activities and essentially pushing resources into less efficient shadow activities. A transition to democratic structures allows to alleviate these commitment problems by extending political rights to other members of society. At the same time, however, democratization implies potentially drastic redistributive consequences by conceding power to a poorer but larger mass of people.[2]

We link the process of democratization to the endogenous emergence of democratic constitutions by considering the case in which, when contemplating an extension of the franchise, the political elite uses their current political power to influence the design of the democratic structures. The oligarchic elite attempts to shape the constitutional details in a way that allows them to reap the benefits from democratization and, at the same time, to isolate policies from the political influence of the newly enfranchised individuals in order to limit excessive redistribution. In particular we concentrate attention to the constitutional details in terms of both the form of state (namely presidential or parliamentary) and the electoral rules (proportional or majoritarian).

Concerning the details of the model we consider a representation of democracy with two political institutions. The state is represented by a legislative, the parliament, and an executive, the government (or president). Public policies are the equilibrium outcome of a strategic delegation game in which the legislative determines the target level of redistribution while the executive is in charge of its implementation. The constitutional design determines the relative importance of parliament and government in policy setting. In particular the constitutional form of government is crucial in determining the independence and accountability of the executive with respect to the legislative. In line with the commonly held view, we focus on the main difference between parliamentary and presidential systems by assuming that in the former the executive is directly accountable to the parliament for the actual policies implemented, e.g. through the possibility of a vote of confidence. In presidential systems, in contrast, policy implementation is delegated to a rather independent executive that is not directly accountable to the parliament, and that can therefore be controlled less tightly when implementing policies.

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[1]See Acemoglu and Robinson, 2000, 2001, 2003, 2004, and Acemoglu, Johnson and Robinson (2004).

[2]This trade-off has is at the heart of the inquiry on the opportunity of democracies developed in the classical contribution of De Tocqueville (1835).

Individuals can influence policy implementation in two ways: by voting their representative into the parliament and by getting involved in influence activities. The right to vote represents *de jure* political power and is linked to the extent of the franchise. In addition to voting, *de facto* political power implies the possibility to successfully influence policy implementation, however. We model influence activities in a menu auction lobbying game along the lines of Grossman and Helpman (1994 and 1996) and consider the possibility that influence groups can lobby the executive. Since policy implementation in terms of the equilibrium degree of redistribution depends on both the target policy set by the parliament, which mirrors the preferences of the electorate, and the preferences of the executive, lobbying the latter provides an alternative possibility to influence political outcomes. The relative importance of parliament and president in the determination of actual policies depends on the form of government, i.e. on the degree of accountability of the executive. In particular, the weight of the parliament in policy implementation is larger in parliamentary democracy.[3]

The characterization of the policy implementation game shows that the elite (which represents a minority inside the parliament) has always a comparative advantage in lobbying activities. Consequently, at the moment of democratization, the elite favor the form of government which allows them to maintain some *de facto* political power over policies at the lowest cost. Since in a presidential system the executive is more independent from the parliament, the elite is willing to implement a parliamentary form of state only when the cost of influencing policies in a presidential system through lobbying exceeds the benefits in terms of reduced redistribution. Our analysis of the differences between presidential and parliamentary systems complements and extends previous results by Persson, Roland, and Tabellini (2000).[4] Their model concentrates on the different mechanisms in presidential and parliamentary systems, in particular concerning the efficiency of public goods provision, and the main focus is on the economic consequences of the constitutional design for the extent of taxation, the size of the state and the level of redistribution. While generating similar results concerning the economic policy outcomes, our model does not consider public goods provision, but focuses on influencing activities and inefficiencies arising from tax evasion. In contrast to the previous literature, however, our focus lies in the *endogenous determination* of the form of state in terms of the conditions at the moment of the democratic transition.

The model delivers a series of predictions. The democratic transition takes place endogenously only once the economy is sufficiently developed i.e. when physical capital is relatively abundant and the available technologies are sufficiently productive. Conditional on the level of development, democratization is less likely the larger the degree of economic inequality in terms of control over factors of production. This is the case since the benefits from democratization expected by an oligarchic elite are larger the larger the level of development while the costs increase with the level of inequality due to the larger redistributive pressure from the newly enfranchised individuals. In terms of constitutional design, the form of state implemented in democracy depends crucially on the level of inequality at the moment of the democratic transition. In particular, larger inequality increases the likelihood of presidential systems arising. On the one hand, presidential systems are characterized by larger equilibrium lobbying activities. On the other hand, presidential systems implement policies leading to smaller states, and in particular less redistribution and lower levels of distortionary taxation. Less redistribution and smaller states imply lower taxes and, therefore less incentive to evade taxation and, therefore, a smaller informal sector. While redistribution is found to respond positively to increase inequality in parliamentary systems (in line with the standard median voter hypothesis), this is not the

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[3]We assume that the executive is easier to influence via lobby activities than the entire parliament. This assumption is made for simplicity in order to illustrate how influence activities may be differently effective in different form of government.

[4]See also Persson and Tabellini (2000), for an overview of the rather small literature on the form of state.

case in presidential systems. Consequently, presidential states exhibit more inequality both before and after democratization. Higher initial inequality is perpetuated through the institutions that it generates.

After studying the determinants of the form of state we extend the model to the explicit consideration of alternative electoral rules in a citizen candidate framework drawing on Osborne and Slivinski (1996). The theoretical predictions concerning the form of state are robust when allowing for the implementation of majoritarian or proportional electoral systems. In a majoritarian system, the group representing a relative majority of the population can choose the target policy set by the parliament on its own. In a proportional system, on the other hand, different groups need to form a coalition to set the level of redistribution if no group has the absolute majority in society. This implies political platforms, which compromise between the preferred policies of the different parties. This extension allows to qualify the predictions. Presidential systems are, as in the benchmark model, expected to emerge for large initial inequality. In this case, however, the electoral rule plays a relatively minor role in policy determination. Consequently, the degree of redistribution is expected to be largely independent of both the level of income inequality and the electoral system in presidential systems. Inside parliamentary systems, which are expected to emerge with lower levels of initial inequality, the electoral rule does matter for redistribution, however. Proportional systems are more likely to emerge in countries with large initial middle class while majoritarian systems should be observed in more unequal ones.

As a final result, we are able to provide a taxonomy of the chosen constitutional system, both in terms of form of government and electoral rules. Our results complement recent contributions by Milesi-Ferretti, Perotti, and Rostagno (2002), Aghion, Alesina, and Trebbi (2004), and Ticchi and Vindigni (2004). This literature mainly concentrates on the effects of electoral rules for policy outcomes, and investigates the optimal choice of electoral rules under the specific circumstances of a constitutional assembly, i.e. at an imaginary moment of constitutional choice, and therefore in an essentially static context. In contrast, our approach not only allows for the endogenous determination of electoral rules *and* the form of state, but also generates a taxonomy in a dynamic context, in particular, how the conditions for a democratization, and therefore the environment of a constitutional assembly, arise dynamically.

Inequality is the crucial determinant for the adoption of democratic institutions, and the design of the constitution characterizing them, which in turn determine the efficiency of resource use and income generation, and consequently the growth path of the economy. In this respect our approach is close in spirit to the work by Galor, Moav, and Vollrath (2004), who provide a unified growth theory that exemplifies the role of inequality in resource endowments for the adoption of growth-promoting institutions such as public schooling, and hence for the transition from stagnation to permanent growth.

The model delivers predictions about the dynamics of democratization patterns as well as the dynamic consequences of democratization and different constitutional designs that can be tested empirically. The predictions as well as the main assumptions of the model are in line with previous findings in the literature. In particular, the crucial role of both the level of development and inequality for democratic transitions is consistent with the findings of Barro (1999) and of Boix (2003) and Boix and Stokes (2003). The results that presidential systems and majoritarian voting generally imply lower levels of overall taxation and redistribution is in line with the findings of Persson and Tabellini (2003, 2004). More generally, recent contributions such as Rodrik, Subramanian, and Trebbi (2004) and Rigobon and Rodrik (2004) provide evidence that higher levels of economic development facilitate the adoption of good political and economic institutions, but that these institutions in turn crucially affect the development path of countries.

The model also delivers a set of novel predictions and implications which have not been previously tested in the literature. One example is that, according to the theory, electoral rules

have more leverage on economic policies under parliamentary systems than under presidential systems. Moreover, little evidence exists concerning the size of the shadow economy under the different systems. Most importantly, the predictions concerning the determinants of the constitution in terms of form of state and electoral rules have not been tested. We perform an empirical analysis of these new predictions using cross-country data that have been used previously in the literature. We devote particular attention to avoiding potential endogeneity problems when testing the predictions about the emergence of political institutions and the level of inequality at the moment of democratization. This is done both using several instruments, and by performing simultaneous equations regressions. We also test all side predictions separately. We thus provide the first empirical analysis of the role of inequality and level of development during the transition to democracy for the design of political institutions in a structural way. After having tested the predictions on the factors leading to democratization we check the role of political institutions for redistribution, the size of the shadow economy and the response of redistribution to inequality in the different political systems. Overall, the empirical findings are in line with the theoretical predictions, and support the main assumptions.

The paper proceeds as follows. The following section introduces the basic framework. Section 3 derives the equilibrium redistribution scheme implemented under democracy. Then, in section 4, the first main result is derived, namely the endogenous determination of the form of state in the process of democratization. Section 5 extends the basic framework to allow also for different voting systems. Section 6 presents the characterization of the features of the endogenous constitution that arises as equilibrium outcome of a democratic transition. Finally, the paper ends with an empirical investigation of the main assumptions and theoretical predictions in section 7.

2 The Basic Framework

This section introduces and discusses the political environment and the different political systems and institutions that we consider in our model economy. We then lay out the economic environment, and the decision problem faced by individuals living in this economy.

2.1 Political Environment

We consider an economy that is populated by an infinite sequence of subsequent generations t of individuals i. Each individual has one parent and one offspring so that there is no population growth overtime. Each generation is composed by a unit mass of individuals. In the following, we omit generation indices t long as there is no danger of confusion. All individuals belong to one of two groups i, which only differ in terms of group size s^i and initial per capita endowments. The members of the smaller group are initially richer, and initially also constitute the political elite, that is, only members of that group have a say in political decisions as clarified below. We label the smaller and richer group the elite, E, which constitutes a share of population $s^E = \eta$ with $0 \leq \eta \leq 1/2$. The larger but poorer group is called the people, P, and has size $s^P = (1 - \eta)$.

The political environment can be characterized by political regimes differing in the extent of the political suffrage in the population. We distinguish between two regimes: oligarchies, $J = O$, in which only a subset of the population, the elite, participates in the political process and the political institutions; and democracies $J = D$ with universal suffrage and participation by all members of society. The participation in the political process, and therefore the distribution of formal - *de jure* - decision power implies decision power over redistributive policies.[5]

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[5]As clarified below, regardless of the form of government, the political regime is essentially characterized by the composition of the parliament.

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Concerning the political institutions we distinguish between a legislative assembly, the *parliament*, and an executive body, the *government (or president)*. The parliament is elected and the composition of parliament mirrors the composition of the electorate population. Decisions in the parliament are made reflecting the will of the majority of representatives.[6] The goal is to investigate policy implementation as resulting from the interaction of legislative and executive, which may have different preferences over redistributive policies. The existence of the different institutions, parliament and president, mirrors the fact than the parliament, the legislative, cannot effectively implement policies on its own. Rather, parliament has to delegate the implementation to the executive, the president. The policy implemented in the economy depends crucially on the distribution of power between parliament and president. This distribution of power, however, depends on the constitutional form of state, or, more precisely, the form of government. We distinguish between *presidential* systems and *parliamentary* systems, which differ in the extent of accountability (independence) of the president from the parliament. In a presidential system the president is not (fully) accountable to the legislature, e.g. through a vote of confidence, and can, to a certain degree, implement other policies than the ones preferred by the parliament. Conversely, a parliamentary system is defined as a constellation in which the president (or, equivalently, the executive) is fully accountable and cannot implement tax policies that do not fully reflect the will of the parliament, since otherwise a vote of confidence leads to the dismissal.[7]

In the model, this difference in accountability is reflected in the degree of freedom left to the president when implementing the tax policy. Denote by τ^{Pr} and τ^G the level of taxation preferred by the parliament and the president respectively, the determinants of which will be discussed below. The form of state determines the relative importance of the parliament in determining tax policies and is captured in the parameter $\pi \in [0,1]$, where $\pi = 1$ implies full accountability of the president to the parliament.

The implemented level of redistribution emerges as equilibrium of a game with the following timing of events.

1. The parliament announces a tax rate $\widetilde{\tau}^{Pr}$ to be implemented by the president.

2. The president decides about a preferred tax rate τ^G.

3. The actually implemented choice (faced by the members of society) is given by,

$$\tau^* = \pi \widetilde{\tau}^{Pr} + (1 - \pi) \tau^G . \tag{1}$$

The equilibrium tax rate is then given by a linear combination of the two preferred tax rates with the weights given by the form of government. The equilibrium redistribution emerging from equation (1) can also be reinterpred as the result of a delegation problem in which the variable π identifies bounds the target level of redistribution chosen by the parliament. In this interpretation the parliament announces a policy $\widetilde{\tau}^{Pr}$ to be implemented by the executive inside bounds which depend on the degree of independence/accountability. In this view the government is free to implement any policy

$$\tau \in \left[\underline{\tau}^{Pr}, \overline{\tau}^{Pr}\right] = \left[\pi \widetilde{\tau}^{Pr}, \pi \widetilde{\tau}^{Pr} + (1 - \pi)\right] . \tag{2}$$

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[6]Section 5 below extends the model to three groups of society. This extension allows us to investigate how different preferences are represented inside the parliament depending on the different electoral rules and to study the endogenous determination of different voting systems.

[7]Despite other differences between the two forms of state, differential accountability of the executive is widely recognized as a key distinction. In empirical studies, the fact whether the cabinet is or is not accountable to the legislature through a vote of confidence is frequently used to distinguish parliamentary and presidential systems, see e.g. Persson and Tabellini (2004) for the use of such a binary variable. To keep the model simple, and to concentrate on the main mechanism, we neglect other differences between presidential and parliamentary forms of state, like agenda setting, the power to propose laws etc.

This timing reflects the idea that the president takes the preferences of the parliament as a constraint when choosing (and implementing) the policy. That is a natural view when considering that the parliament delegates the implementation of its preferred tax policy to the president. The form of government sets limits to the extent to which the president can influence the implemented policy, as was discussed in the last section. Larger accountability implies less freedom for the executive in policy implementation, reflected by a larger π. The larger the accountability the smaller the allowed deviation from the preference of the parliament, with the president having no influence on the tax rate when he is fully accountable with $\pi = 1$. In the limit case of $\pi = 1$ the government can only implement the tax policy determined by the parliament. In the following, systems with full accountability $\pi = 1$ are therefore called *parliamentary*. Conversely, the less accountable governments are (i.e. the lower π), the more influence governments have on the determination of the implemented tax rate. For simplicity we call all systems with $\pi < 1$ *presidential*. Under oligarchy, the elite has total control over the policy implementation, i.e. holds all *de jure* and *de facto* political power.[8]

This completes the description of the political environment. In the following we investigate the endogenous determination of the preferred policies τ^{Pr} and τ^{G}, as well as the optimal choice of the form of state, reflected by the accountability parameter π.

2.2 Determination of Policies: Voting and Lobbying

Individuals can influence policy making in two ways: by voting representatives into parliament who express and represent their preferences over policies in the legislative process; and by directly influencing the implementation of particular policies through lobbying. To distinguish between the effects of voting and lobbying for policy outcomes, elections determine the position of the parliament over taxation. In particular, we assume that the parliament's position over policies mirrors the preferences of its elected members. Concerning the voting, we assume that both groups of society are represented in parliament according to election outcomes that reflect the composition of the electorate population. In the simple case with two groups only this implies that the parliament represents the preferences of the elite under oligarchy while the majority of seats is assigned to the people under democracy.

Besides voting representatives, each group can influence policy implementation via lobbying activities. To distinguish lobbying from voting, we assume that lobbying activities can be directed to the president to influence the executive position over alternative policies.[9] Concerning the influencing activities, we adopt a lobbying game along the lines of Grossman and Helpman (1994, 1995) and assume that the president's objective is to choose the policy which maximizes the contributions collected from influence and lobbying activities, while respecting the limits on the implementable policies set by the parliament. Different interest groups offer support to the incumbent government in order to gain the possibility to influence the policies implemented by the executive. We assume that both groups of the population can coordinate without cost, so there are only two pressure groups in society, the elite and the people. Every group offers a menu of lobby contributions conditional on obtaining or not the right to set the policy. Hence the strategy of any group amounts to deciding the contribution they are willing to pay for getting the right to set the policy. Contributions are only paid if the desired policy is actually implemented. The president then has two options: assigning the right to choose to group E or

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[8]Technically speaking, under oligarchy $\pi = 1$.

[9]As in Grossman and Helpman (1994) contributions can be equivalently interpreted as campaign contributions. Also, and equivalently, one could assume that the contributions influence, together with voting, the position of parties without making explicit reference to a differential role of the parliament and the president, as in Grossman and Helpman (1997). We stress the different roles of the institutions, because we are interested differences between parliamentary and presidential systems. Characterizing these differences by different levels of accountability of the executive, this constellation leaves more room for political influence alternative to voting.

P.[10] Denote the policy-contingent contribution schedules as,

$$L^j = \left\{ L^j(j), L^j(i) \right\} \tag{3}$$

where $L^j(i)$ is the contribution offered by group j contingent on allocating to group i the right to set the policy. If the desired policies differ, it is never optimal to offer a contribution for having the other group deciding over policies. In any truthful Markov strategy it holds that $L^j = \left\{ L^j(j) \geq L^j(i) = 0 \right\}$. This is the case because only the difference between the proposed contributions for the different alternatives affects the policy regulator's, i.e. the president's, choice. Therefore, it is never optimal to offer a positive amount for the least favorable alternative. The president's objective is to maximize contributions under the constraints fixed by the parliament in order to stay in office. This implies that the president chooses the desired policy of the group offering the highest contribution. For simplicity, we assume that bids are submitted simultaneously without possibilities to renegotiate on any side. If both groups offer the same contribution then the president allocates the right randomly.[11]

The timing of the game allows the possibility of strategic delegation to the government since the parliament can set a fiscal policy which differs from the preferred one. This is due to the fact that the parliament acts rationally and anticipates the president's reaction. This strategic behavior at the moment of delegating the implementation of the policy is studied in the next section.[12] But before, we complete the set-up of the model by introducing the economic environment.

2.3 Economic environment

During their life, all individuals invest their capital and receive an income from the returns of that investment. Individuals derive utility from consuming and bequeathing this income, that is

$$u_i = u(c_i, b_i), \tag{4}$$

where $u(\cdot)$ satisfies the standard properties.[13] Individuals are endowed with physical capital k, which they inherit as bequests from their parents, with $k_i(t) = b_i(t-1)$. Total capital available in the economy during the life of a given generation t, $k(t)$ is given by the bequests of the parent generation. Initially, members of the elite are endowed with larger capital endowments than members of the people. Hence, the elite constitute the richer group in terms of $k^E > k^P$. Vectors are denoted with bold letters so that $\mathbf{s} = \left\{ s^E, s^P \right\}$ and $\mathbf{k} = \left\{ k^E, k^P \right\}$.

Production of a unique consumption good takes place in a formal and in an informal sector in which the only input in production is capital. The main difference between the two sectors is that rents accruing to capital in the formal sector are verifiable and can be taxed, while capital rents from the informal sector can be hidden, and therefore cannot be taxed. Since hiding capital and employing it in informal production to prevent taxation is increasingly difficult, production in the informal sector exhibits decreasing marginal productivity. In contrast, production in the formal sector is linear. Moreover, new innovations and technological improvements can be adopted and operated more easily and at a larger scale in the formal sector. Total production

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[10]We assume that the government fully succumbs to the successful lobby when implementing a policy. All results are qualitatively unchanged in case of partial implementation of the winning lobby's policy as long as only one group is allocated the exclusive right to affect the policy according to its preference.

[11]As seen below this is an out of equilibrium event.

[12]The discussion of the relationship between this game and the games involving strategic delegation in the literature is postponed to the section on electoral systems.

[13]The precise formulation of the utility function is not crucial for the main insights. The development dynamics of the economy, as shown below, essentially depend on the distribution of factor endowments and political influence. The decision on consumption and bequest may, as in reality, differ across different groups of the society.

denoted by Y derived from formal sector F and informal sector I is therefore given by

$$Y^J = A^J k_F + k_I^\alpha , \qquad (5)$$

where $\alpha \in (0,1)$ and A^J reflects factor productivity in the formal sector under a given institutional environment indicated by J.[14] Income produced in each sector is fully distributed to the capital invested in that sector so that the rents equal average productivity.[15] When making their investment decision, individuals can freely choose, in which sector to invest their capital. The assumptions about taxability of rents therefore generate a trade off: investing in informal activities allows to evade taxation but only at an increasing cost. Denote by τ the rate at which income is taxed. Individual net rents from capital investments are then given by,

$$(1 - \tau) r_F = (1 - \tau) A^J \quad \text{and} \quad r_I = k_I^{\alpha-1} . \qquad (6)$$

Individuals choose optimally in which sector to invest how much of their capital in order to maximize income. A factor market equilibrium is therefore given by an allocation of capital investment in the two sectors and a vector of net rents for which no agent has an incentive to change its investment choice.

3 Equilibrium Redistribution

To derive the equilibrium redistribution scheme, we first derive the factor market equilibrium, then study the preferred schemes of each group. After investigating the possibilities for implementing these tax rates, we finally derive the actually implemented fiscal schedule.

3.1 Factor Market Equilibrium

Before studying the endogenous determination of redistributive policies it is useful to study the factor market equilibrium in oligarchies and democracies conditional on a given fiscal schedule.

Under oligarchy part of the population is excluded from participating in the political process. In particular, the people have no *de jure* and *de facto* power to influence the legislative and the executive. As pointed out by Acemoglu and Robinson (2000) this raises a commitment problem on side of the elite. If they can decide on all matters of the public sphere, in particular taxation and redistribution, they cannot credibly commit to any fiscal schedule. This implies, in particular, that they cannot commit not to tax away and appropriate a part (or all) of the people's incomes once the investment in the formal sector is realized. This has important implications for the factor market equilibrium as all individuals face uncertainty about the possibility to appropriate the returns from their investment. As the lack of commitment materializes in lower expected returns of investments for all individuals due to a poor protection of property rights, both the elite and the people are affected by the consequences of the commitment problem.[16]

There is ample evidence that a reliable political environment facilitates property rights enforcement and beneficial economic institutions in general, see e.g. Rigobon and Rodrik (2004) for a recent study. This has two implications. On the one hand, inefficiencies arise from suboptimal

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[14]Only differences in relative productivity are needed for the argument, so we normalize factor productivity in the informal sector to 1. As studied later the productivity A^J can depend on the political system.

[15]This assumption is without relevance for the main results. Equivalently rents can be determined in competitive markets and set equal to marginal productivity.

[16]The elite gains from democracy in our model since the allocation of resources is distorted in oligarchies by the fact that the elite cannot credibly commit to abstain from regressive redistribution. Equivalently one could also consider, as is done in previous contributions, the facilitation of the provision of education, property rights protection, or public goods, or the strategic motives of conflicting parts of the elite for extensions of the franchise in order to influence implemented policies.

investment in new technologies etc. even in the formal sector. These thoughts are reflected in the assumption that factor productivity A^J depends on the particular political regime $J = O, D$ in place. In particular, we assume that $A^O < A^D$, that means the (expected) returns of investing in the formal sector are higher in democracies. Secondly, as a direct consequence of the elite being unable to credibly announce any fiscal schedule, the people have an incentive to hide their resources in the informal sector where they cannot be taxed. Being denied de jure control over policies, they only face the possibility to be expropriated when investing in the formal sector and, as a result, rationally decide to invest all their capital in the informal sector, such that $k_I \geq (1 - \eta) k^P$. Therefore two possible factor market equilibria can be observed in oligarchies depending on the relative profitability of the two sectors.

Lemma 1. *Under oligarchy, there are two possible factor market equilibria with all capital of the people invested in the informal sector and either (i) no production in the formal sector at all, or (ii) the elite investing (some) capital in the formal sector.*

Thus, under an oligarchic regime in equilibrium if anything, only the elite invests in the formal sector.

Under democracy, in contrast, all members of society have *de jure* power over policies and there is full commitment with respect to the chosen tax and redistribution scheme. This implies that the parliament can credibly announce a fiscal redistribution scheme.[17] The factor market equilibrium in democracy can be characterized by either an interior solution in which positive amounts of capital are invested in both sectors, or a corner solution in which all capital flows to the informal sector. In the first case the net rents in both sectors are equal, such that

$$(1 - \tau) r_F = r_I . \tag{7}$$

This is the case if $(1 - \tau) A^j = k_I^{\alpha-1} = (1 - \theta(\tau))^{\alpha-1} k^{\alpha-1}$, where $\theta(\tau)$ represents the share of capital invested in the formal sector, with

$$\theta(\tau) = 1 - \frac{1}{[A^D(1 - \tau)]^{\frac{1}{1-\alpha}} k} .$$

The formal sector is non active if the net returns obtainable from there are inferior to the rents received in the informal one when all the capital of the economy is invested there. For any level of technology A^D and any k there exists a level of taxation $\bar{\tau}(A^D, k)$ large enough such that $k_F = 0$. This level is characterized by $(1 - \bar{\tau}) A^D = k^{\alpha-1}$, implying

$$\bar{\tau}(A^D, k) = 1 - \frac{1}{k^{1-\alpha} A^D} . \tag{8}$$

Thus, for any $k^{1-\alpha} A^D > 1$ there is a maximum level of taxation above which the formal sector disappears. We now turn to study the determination of equilibrium redistribution.

3.2 Preferences for Redistribution

Now turn to study the determination of equilibrium redistribution in democracies with universal suffrage. Hence, the composition of the parliament mirrors the composition of the entire population, in the simple case of only two groups in society the majority of seats in parliament is held by members of the people regardless of the electoral rules in place. Since the people constitute the poorer group in society, their preferred tax rate involves progressive redistribution

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[17]The assumption that under oligarchy there is no commitment, while commitment is perfect under democracy is made for simplicity. The main logic is unchanged as long as democratic institutions are assumed to have better checks and balances so that they suffer *relatively less* of problems of commitment over policies.

in equilibrium. For simplicity, we assume that all revenues from taxation are evenly distributed among all members of society so that net individual income of a member of group i is given by

$$y^i(\tau) = (1-\tau)y^i + T(\tau) \ . \tag{9}$$

The public budget is then given by,

$$T(\tau) = \tau y(\tau) = \tau A^D \theta(\tau) k \ , \tag{10}$$

where k is the average capital endowment in the economy. This implies a progressive redistribution schedule for any $\tau > 0$.[18]

The level of redistribution preferred by group i is the one that maximizes net income, denoted by $y^i(\tau)$, and is given by,

$$\begin{aligned}
\tau^i &= \arg\max_\tau y^i(\tau) = \arg\max_{0 \le \tau \le \overline{\tau}(A^D,k)} \left\{ (1-\tau)A^D k^i + \tau A^D \theta(\tau) k \right\} = \tag{11} \\
&= \arg\max_{0 \le \tau \le \overline{\tau}(A^D,k)} \left\{ (1-\tau)y^i + \tau \theta(\tau) y \right\} \ .
\end{aligned}$$

From equation (8) it is never optimal to choose a tax rate larger or equal to $\overline{\tau}(A^D,k)$ so that $\tau^i \in (0, \overline{\tau}(A^D,k)]$. The first derivative of the problem (11) delivers,

$$\frac{\partial y^i(\tau)}{\partial \tau} = (y - y^i) - \frac{(A^D)^2 [(1-\alpha)(1-\tau) - \tau]}{(1-\alpha)[A^D(1-\tau)]^{\frac{2-\alpha}{1-\alpha}}} \ . \tag{12}$$

Members of the poorer group of society, the people, face a trade-off concerning the optimal tax rate: a larger τ allows for more redistribution, but it also reduces the revenues that can be redistributed due to the increasing distortions. The analysis of the second derivative show that the problem is strictly concave so that the tax rate desired by the people τ^P can be implicitly characterized by interior first order conditions,

$$F^P(A^D, k, k^P) := \frac{\partial y^P}{\partial \tau} = 0 \iff \tag{13}$$

$$(y - y^P) - \frac{(A^D)^2 [(1-\alpha)(1-\tau) - \tau]}{(1-\alpha)[A^D(1-\tau)]^{\frac{2-\alpha}{1-\alpha}}} = 0 \ .$$

Since the income of the people is lower than the average, their preferred tax rate is strictly positive. Moreover, studying condition (13), one can infer how the equilibrium level of redistribution preferred by the people changes with inequality as measured by the difference between the average income of the poor and the average income in the economy. As a, crude, measure of inequality consider the inequality index,

$$I(y, y^i) = \left(1 - \frac{y^i}{y} \right) \ , \quad i \in \{E, P\} \tag{14}$$

This index is negative for the elite and it is positive (and bounded in the interval $(0,1)$ for the people.[19] Since the solution for τ^P is characterized by an interior solution we can look at the change in the preferred level of redistribution in response to increasing inequality. We have,

$$\frac{\partial \tau^P}{\partial I(y, y^P)} = -\frac{\partial F^P(A^D, k, k^P)/\partial I(y, y^P)}{\partial F^P(A^D, k, k^P)/\partial \tau^P} > 0 \iff (y - y^P) > 0 \ , \tag{15}$$

---

[18]This standard formulation of a linear progressive redistribution scheme has been used frequently in the literature, including the contribution of Meltzer and Richard (1981).

[19]The measure $I(y, y^P)$ for inequality is often used in political economics since it reflects the income difference between the average and the median voter.

because the denominator represents the second order necessary condition for a maximum, and therefore must be negative. Equation (15) represents a version of the so called median voter hypothesis formalized by Meltzer and Richard (1981), which states that the tax rate preferred by the median voter, here a member of the people who constitute the majority in the parliament, is increasing with the difference between the y^p and the average income y. The maximum degree of inequality is given by $I\left(y, y^P = 0\right) = 1$ and the associated level of taxation is denoted by $\overline{\tau}^P < 1$.

In contrast, members of the elite are richer than the average. From (12) it is obvious that their net income is strictly decreasing in τ, so the level of taxation preferred by the elite is given by $\tau^E = 0$. Hence we have,

Lemma 2. *The people always desire a higher level of redistribution than the elite,*

$$1 \geq \tau^P > \tau^E = 0 . \tag{16}$$

3.3 Lobbying and Strategic Delegation

In order to study the equilibrium determination of redistribution, we solve the policy determination game backwards. First, consider the lobbying game which is played after the announcement of the target policy set by the parliament. For any $\widetilde{\tau}^{Pr}$ the organized lobbies representing the two groups of society make their contribution offers. The winner of the game is given by the group that for any given vector $\left\{A^D, k, \mathbf{k}, \widetilde{\tau}^{Pr}, \pi\right\}$ is willing to offer the higher contribution, i.e. the group which derives the larger (differential) benefit by obtaining the right to influence policy implementation. The differential benefits accruing to each of the two lobbies if they manage to obtain the influence on policy setting are given by the difference between the total income that the group can get by implementing its preferred policy versus the income in case the group loses the lobbying game. From (16) it is clear that the elite lobbies to implement a policy $\tau^G = 0$ which implies that the equilibrium redistribution is in this case given by $\tau_E^* = \pi\widetilde{\tau}^{Pr}$. The people, on the other hand, lobby for a level τ^G, which allows them to obtain τ^P in equilibrium.

Lobbying Game. There are two possible scenarios of the lobbying game. If, $\pi\widetilde{\tau}^{Pr} > \tau^P$, then if the people manage to influence policy implementation they maximize their income by setting $\tau^G = 0$ so that $\tau^* = \pi\widetilde{\tau}^{Pr}$.[20] As a result the policy option implemented by the government is the same irrespective of the identity of the winner of the lobbying game. This implies that both groups offer zero contribution and $\tau^G = 0$ and $\tau^* = \pi\widetilde{\tau}^{Pr}$ irrespective of the winner of the lobbying game.[21] If, in contrast, $\pi\widetilde{\tau}^{Pr} \leq \tau^P$ then there always exists a level $\tau^G \in [0, 1]$ given by $\tau^G = \left(\tau^P - \pi\widetilde{\tau}^{Pr}\right) / (1 - \pi)$ which will be implemented by the people to get an equilibrium level of redistribution given by $\tau^* = \tau^P$. Denote by $\Delta y^j(i)$, the income differential received by group j if the lobbying game is won by group i.

Proposition 1. *For any $\left\{A^D, k, \mathbf{k}, \pi\right\}$ and for any target policy set by the parliament $\widetilde{\tau}^{Pr}$, the elite always wins the lobbying game by offering a contribution equal to $L^E\left(\pi, I\left(y, y^P\right)\right) = \Delta y^P(E)$, so that $\tau^G = 0$ and the equilibrium level of redistribution is given by*

$$\tau^* = \widetilde{\tau}^{Pr}\pi . \tag{17}$$

---

[20] As will become clear below, the parliament will never set $\pi\widetilde{\tau}^{Pr} > \tau^P$, which is therefore an out of equilibrium event.

[21] In this case, there is no real conflict of interests between the two lobbies as both want the president to implement zero redistribution. This implies that no group has a real incentive to offer a positive contribution in order to the get the option to set the policy τ^{Pr}, equivalent to the equilibrium with non active lobbying in Grossman and Helpman (1994).

Proof. In order to study the outcome of the lobbying game, we need to characterize the differential income of the two groups. Denote as a and b the fractions of total income received by the elite when the policies $\tau_E^* = \pi\widetilde{\tau}^{Pr} < \tau_P^* = \tau^P$ are implemented. The differential benefits are therefore given by,

$$
\begin{aligned}
\Delta y^E &= ay(\pi\widetilde{\tau}^{Pr}) - by(\tau^P) \quad \text{, and} \\
\Delta y^P &= (1-b)y(\tau^P) - (1-a)y(\pi\widetilde{\tau}^{Pr}) \, .
\end{aligned}
\tag{18}
$$

This implies

$$
\Delta y^E > \Delta y^P \Leftrightarrow ay(\pi\widetilde{\tau}^{Pr}) - by(\tau^P) > (1-b)y(\tau^P) - (1-a)y(\pi\widetilde{\tau}^{Pr}) \, .
\tag{19}
$$

Rearranging, one obtains

$$
\Delta y^E > \Delta y^P \Leftrightarrow y(\pi\widetilde{\tau}^{Pr}) > y(\tau^P) \, ,
\tag{20}
$$

which is always true for $\pi > 0$, irrespective of the actual a and b. $\qquad\square$

The intuitive reason for this result is that the distortions from taxation in the form of a reduction of the share of capital invested in the formal sector increase with the tax level. Therefore, the policy preferred by the elite generates higher total income and, consequently, the propensity to pay to get the power is larger for the elite than for the people. This implies that either the elite proposes a positive contribution and wins the lobby game or both groups abstain from active lobbying. In both cases the equilibrium level of redistribution coincides with the lower bound fixed by the parliament.

We can now consider the choice of the parliament. When delegating tax implementation to the government, the parliament rationally anticipates the equilibrium of the lobbying game and chooses the tax rate accordingly.[22] In the simple case with only two groups the parliament represents the preferences of the majority of the voters, i.e. the people. The goal of the parliament is therefore to implement the tax rate preferred by the people τ^P. This can be done successfully if it is possible to set a target policy $\widetilde{\tau}^{Pr} \in [0,1]$ such that $\widetilde{\tau}^{Pr} = \tau^P/\pi \leq 1$. Therefore, if $\tau^P < \pi$ the parliament can strategically delegate the executive and is able to implement its preferred policy despite not being able to perfectly control the president, who is influenced by the elite's lobby. Strategic delegation is not always successful, however. In the case in which the parliament would actually require a nominal tax rate exceeding 1 to achieve its actually preferred effective tax rate τ^P, the parliament is constrained in setting an announced tax rate of 1, because the announced tax rate cannot exceed 1. In this case, when $\tau^P \geq \pi$ the parliament cannot fully offset the policy choice of the president, and therefore cannot obtain the unconstrained optimal level of redistribution. Hence, the actually implemented level of taxation is strictly lower than the one desired by the people. Since the problem is strictly concave, the parliament maximizes the income of the people by setting a target $\widetilde{\tau}^{Pr} = 1$ so that $\tau^* = \pi$.

3.4 Equilibrium redistribution under different political regimes

From the previous results it is clear that the equilibrium redistribution is either $\tau^* = \tau^P$ if the parliament (and hence the people) is not constrained by the corner at full taxation and can implement its preferred taxation despite imperfect delegation; or $\tau^* = \pi$ in the case in which the president can successfully reduce effective taxation from the scheme with full redistribution announced by the parliament. Which case prevails depends on $\tau^P \gtreqless \pi$.

This observation is recorded in,

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[22]The literature on strategic delegation in policy selection has studied the possibility that voters rationally elect candidates with preferences different from their own anticipating the equilibrium policy determination. See Persson and Tabellini (1994, 2000) , and Chari, Jones, and Marimon (1997). In the following we discuss how our approach relates with these works.

Proposition 2. *For any $\{A^D, k, \mathbf{k}, \pi\}$ the equilibrium level of redistribution in democracy is given by,*

$$\min\{\tau^P, \pi\}. \tag{21}$$

Proof. The claim that the implemented redistribution scheme is given by either τ^P or π follows from the fact that, if $\tau^P < \pi$, the parliament can strategically announce a sufficiently high tax rate τ^{Pr} to obtain τ^P. If, on the other hand $\tau^P \geq \pi$, the maximal announcement is 1. Since in both cases, the elite wins the lobbying game due to Proposition 1 implying $\tau^G = 0$, which determines the set of possible tax rates. The implementation of the smaller of the two rates follows directly from the conditions for a corner solution of $\widetilde{\tau}^{Pr}$. $\qquad\square$

As was noted in Lemma 1, under an oligarchic regime only the elite invests in the formal sector, if at all. This implies that when choosing the announcement tax rate τ^{Pr}, the parliament (representing the interests of the elite) optimally chooses a tax rate of zero under oligarchy. In fact, all the elite can do in this case is to tax themselves and redistribute the revenues to themselves or to the entire population. Hence, taxation under oligarchy is zero $\tau^O = 0$.[23] People fully invest in the informal sector, because they cannot be assured to appropriate any rents from the formal sector. This is in line with historical and empirical observations which provide evidence that non-democracies tend to implement more regressive tax schedules (or equivalently that democracies tend to implement more progressive ones).

Lemma 3. *For any $\{A^O, k, \mathbf{k}, \pi\}$ the equilibrium level of redistribution in oligarchy is $\tau^O = 0$.*

Having solved the game on policy implementation under democratic and oligarchic structures, we now turn to the endogenous determination of these democratic structures, and, in particular, the optimal choice of accountability π.

4 Endogenous Form of State

This section investigates the role of the circumstances of an endogenous democratic transition for the form of state that is implemented under democracy. We begin by illustrating the path to democratization, and the constitutional choices made when the transition is immanent.

4.1 Democratic transition

Under oligarchy, the elite monopolizes the *de jure* political power over policy implementation. This has several implications concerning both the level of equilibrium redistribution and the possibility to profitably invest in the formal sector. Of course, the elite has always the possibility to voluntarily concede political power to the people. In fact, the elite faces a trade-off between keeping the monopoly on power and extending political power to the people and democratize.[24] Several earlier contributions have considered similar situations in which elites were forced to extend the franchise or had an incentive to extend it for their own economic benefits. In a series of contributions, Acemoglu and Robinson (2000, 2001, 2003, 2004) have illustrated situations in which oligarchic elites were forced to extend the franchise in the face of social unrest and the

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[23]In a more general setting, this is true irrespective of the form of government π under oligarchy.

[24]We use the label democratization for the sake of clarity and illustration. In fact, the model applies more generally to situations in which the political institutions are changed endogenously in order to reap the benefits of larger efficiency linked to the relaxation of commitment problems. In that sense, gradual extensions of the franchise, or events such as the "glorious revolution", despite not being "democratic transitions" in the narrow sense, can be considered in the current framework, as they involve a change of constitution associated with a devolution of power from a ruling elite to formerly disenfranchised and politically powerless societal classes.

immanent threat of social upheaval. In a nutshell, the extension of political franchise to larger parts of the society were the only way for the elite to commit not to tax the people's incomes away, and therefore to avoid a revolution.[25] Other contributions like Bourguignon and Verdier (2000), Lizzeri and Persico (2004) and Gradstein (2004b) have proposed complementary mechanisms that might induce the elite to concede political power to broader groups of society in exchange for economic benefits. The channels described in these articles work through better incentives to accumulate growth-enhancing human capital under democracy, more efficient provision of public goods and the prevention of inefficient rent-seeking and corrupt behavior, and superior possibilities of property rights protection under democracy, respectively.

In the present model the elite faces a trade off between remaining in oligarchy or releasing power to the people, which arises from commitment problems and distortions from taxation. The elite has to trade off an oligarchy that can be continued at the cost of an inefficient allocation of resources in the informal sector, but with the benefit of not having to redistribute income to the poorer people. Or a transition to democracy, where resources can be more efficiently allocated among formal and informal sector, but at the price of progressive redistribution and the efficiency losses implied by taxation of revenues from the formal sector. In order to be able to assess which option is better for the members of a given generation of the elite, the redistribution scheme that is implemented under democracy must be fully specified. To that end, however, the elite has an additional degree of freedom since the form of state must be determined, i.e. the accountability of the executive to the legislative must be set by constitutional rules, in the process of democratization. The elite can initiate a process of democratization with an offer concerning the constitutional rules, in particular, concerning the form of state. The logic of our analysis is, in this respect, similar to the one of Aghion, Alesina, and Trebbi (2004) and Ticchi and Vindigni (2004), who provide essentially static theories on the choice of the constitution in terms of electoral rules. The main conceptual difference of our approach is that we link the choice of a new constitution to the endogenous transition from a political system to another with the goal of investigating how the emerging constitution is affected by the timing of the transition (or equivalently the level of development of the economy) and the circumstances under which the transition takes place (in particular the level of inequality).

Since the preferences of elite and people over the form of state do not coincide we observe conflict of interests. In particular, the elite, which has been shown to be relatively more effective in political influence via lobbying, prefers a form of state where the parliament cannot closely control government actions. The contrary is true for the people, who are more powerful and effective in voting activities, and therefore would prefer an executive that is more accountable to the people-dominated parliament. Without modelling explicitly the game inside the constitutional assembly for the resolution of this conflict of interests we assume that the elite, having the possibility to offer a democratic regime, makes an offer about the form of the state, i.e. a level of π.[26]

Any generation of the elite has the possibility to offer democratization. As said before, the advantage of the democratic transition derives from the possibility to reap the benefits of the larger productivity of the investment in the formal sector. On the other hand, extending the political power to the people involves costs in terms of larger redistribution since $\tau^D = \min\left\{\tau^P, \pi\right\} \geq \tau^O = 0$. The elite can successfully limit redistribution by political influence. This influence, however, involves a cost which is represented by the lobbying contribution.

Hence, the necessary and sufficient conditions for the elite to propose a democratic transi-

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[25]See also Acemoglu, Johnson, and Robinson (2004) for a detailed discussion of this 'social conflict'.

[26]Since the focus of the paper is on the analysis of the emergence of the endogenous constitution we do not investigate in details the game possibly played to choose how to choose the constitution. Theoretical investigations of the game dealing with "choosing how to choose" the rules of the political game include Messner and Polborn (2004).

tion can be stated as follows: For any given form of state under democracy π, and any given $\{A^D, A^O, k, \mathbf{k}\}$ the elite prefers a democratic regime to an oligarchic system if an only if,

$$
\begin{aligned}
y^E\left(\tau^O, A^O\right) &< y^E\left(\tau^*\left(\pi\right), A^D\right) \\
\Leftrightarrow \quad A^O k^E &< \left(1 - \tau^*\left(\pi\right)\right) A^D k^E + \tau A^D \theta\left(\tau\right)^\alpha k^\alpha - L\left(\pi, I\left(y, y^P\right)\right)
\end{aligned}
\tag{22}
$$

If this condition does not hold, the elite obtains a higher net income under oligarchy, and therefore strictly prefers to stay in power. While we postpone the analysis of the conditions under which democratization takes place it is immediate from (22) that inequality plays an important role. In fact, if there were no inequality in society, i.e. for $k^E = k^P = k$, redistribution would be zero under any form of government in democracies, $\tau^*\left(\pi\right) = 0$ so that democracy would represent the best option for the elite for any $A^D > A^O$. In the presence of inequality, however, the elite faces a trade-off. We already know that the larger is inequality the less appealing is the democratic transition because inequality increases τ^P and, therefore, desired redistribution by the people. Hence, for any $I\left(y, y^P\right)$ the profitability of democracy increases with the gap $\left(A^D - A^O\right)$ reflecting the inefficiency associated with the oligarchic regime.

4.2 Form of State

We now investigate the elite's preferred level of accountability π under which it would actually initiate a democratic transition. In other words, we look for the level of π which maximizes the elite's net income under democracy, given by the expression on the right hand side of condition (22). The analysis of the game determining the equilibrium level of redistribution in democracies in the last section has shown that for any form of government π only two possible levels of redistribution can emerge in equilibrium. Either the parliament can implement its preferred tax rate equal to τ^P or the elite can successfully limit redistribution to π. Consequently, the possibility to influence the equilibrium policy through the lobbying process is a viable option only if the parliament is constrained in setting the taxation, i.e. if $\widetilde{\tau}^{Pr} = 1$. For any given level of τ^P we can therefore identify a unique lower bound $\underline{\pi}\left(\tau^P\right)$ given by,

$$
\underline{\pi}\left(\tau^P\right) = \left\{ \begin{array}{ll} \widetilde{\tau}^P\left(\tau^P, \pi\right) = 1 & \forall \pi \leq \underline{\pi}\left(\tau^P\right) \\ \widetilde{\tau}^P\left(\tau^P, \pi\right) = \tau^P/\pi & \forall \pi > \underline{\pi}\left(\tau^P\right) \end{array} \right.
\tag{23}
$$

This essentially implies that $\underline{\pi}\left(\tau^P\right) = \tau^P$. The president, once lobbied, implements the lower bound of this range that is imposed on him by the political institutions, $\pi\widetilde{\tau}^{Pr}$. As a direct result of the lobbying game, the president has some discretion in setting the policy only if the level of accountability is not too large, i.e. if $\pi < \underline{\pi}\left(\tau^P\right)$. This result implies a limit to the parliament's possibility to strategically counteract the lobbying influence of the elite on the president. If the tax desired by the parliament is very large (for example close to one), any possibility of the president amending the implemented tax rate induces the parliament to revise its announcement upwards, up to full taxation. Whenever the parliament announces full taxation, however, the effective taxation cannot exceed π, as shown above in Proposition 2.

Consider first the minimum level of $\underline{\pi}(\tau^P)$ above which the parliament can induce its preferred level of redistribution by strategic delegation: $\underline{\pi}(\tau^P) = \tau^P$. Since τ^P is implicitly defined by condition (15), τ^P increases with inequality. We can therefore implicitly denote the lower bound on π as a function of the degree of inequality. The larger the degree of inequality the larger the preferred τ^P and the larger is the degree of accountability necessary to the parliament to control policy implementation.

Proposition 3. *(i) For any level of inequality, and accordingly any given τ^P, there exists a minimum level of accountability $\underline{\pi}\left(\tau^P\right)$ such that for any $\pi > \underline{\pi}\left(\tau^P\right)$ the equilibrium policy is given by $\tau^* = \tau^P$ while for any $\pi < \underline{\pi}\left(\tau^P\right)$ we have $\tau^* = \pi$. (ii) The threshold $\underline{\pi}\left(\tau^P\right)$ is*

increasing in $I\left(y, y^P\right)$, implying that the range of levels of π in which the elite can effectively influence the degree of redistribution increases with inequality: $[0, \underline{\pi}(\tau^P)]$.

Proof. For interior solutions for π, true distortions from taxation are necessary, i.e. $\widetilde{\tau}^{Pr} = 1$. Because of Proposition 2 the maximum taxation implemented under presidential systems is π. From equation (23) and the discussion about the parliament's optimal announcement policy, we know that $\partial \widetilde{\tau}^{Pr}(\tau^P, \pi)/\partial \pi < 0 \; \forall \; \pi > \underline{\pi}$, but $\partial \widetilde{\tau}^{Pr}(\tau^P, \pi)/\partial \pi = 0 \; \forall \; \pi \leq \underline{\pi}$ because $\widetilde{\tau}^{Pr}$ is bounded from above at 1. In this case the parliament cannot react to the lobbying influence on the president by demanding a higher tax, and for any $\pi \leq \underline{\pi} : \tau^* \leq \tau^P$. Therefore, the elite can only effectively restrict taxation through lobbying the president if the announcement of the parliament $\widetilde{\tau}^{Pr} = 1$. This is only possible if a $\pi < \underline{\pi}$ can be implemented. Alternatively, if $\widetilde{\tau}^{Pr} < 1$, the elite cannot successfully induce an equilibrium tax rate different from the one preferred by the people even if the elite wins the lobbying game. The result follows since

$$\frac{\partial \underline{\pi}(\tau^P)}{\partial I\left(y, y^P\right)} = \frac{\partial \underline{\pi}(\tau^P)}{\partial \tau^P} \frac{\partial \tau^P}{\partial I\left(y, y^P\right)} > 0. \tag{24}$$

$\square$

This result implies that a sufficiently large level of inequality is a necessary condition to make a presidential system profitable for the elite. The reason is that a larger level of inequality increases the preferred level of redistribution by the parliament. But the larger the target redistribution τ^P, the more strict is the required accountability necessary to implement the target by strategically delegating to the president so that the minimum degree of π, which allows the parliament to obtain τ^P, increases. In other words, even a more accountable president can successfully implement a policy different from τ^P. This implies that, when inequality is higher, the elite is successful in effectively influencing the policies even if the president is more accountable, i.e. for larger levels of π. In other words, when inequality is larger, the people can implement their preferred tax rate only if the parliament can control the executive more closely, that is, when the president is more accountable.

We now turn the optimal choice of the form of government from the elite's point of view. The level of π preferred by the elite results in the optimal balance between a successful limitation of redistribution and the associated cost of lobbying $L^E\left(\pi, I\left(y, y^P\right)\right)$. As seen before, in the range $\pi \in [\underline{\pi}(\tau^P), 1]$ the strategic delegation of policy implementation results in $\tau^* = \tau^P$, so lobbying the president cannot avoid the implementation of the parliament's preferred redistribution scheme. In this situation the elite has no incentive to contribute any positive amount so that $L^E\left(\pi, I\left(y, y^P\right)\right) = L^P\left(\pi, I\left(y, y^P\right)\right) = 0$ so that $\tau^G = 0$. As a result the utility of the elite is the same for all $\pi \in [\underline{\pi}(\tau^P), 1]$. Assume that in this case a parliamentary system is implemented.[27]

The elite, in turn, can succesfully limit the degree of redistribution in the range $\pi \in [0, \underline{\pi}(\tau^P)]$ but only at the cost $L^E\left(\pi, I\left(y, y^P\right)\right)$. From Proposition 1 we have,

$$L^E\left(\pi, I\left(y, y^P\right)\right) = \Delta y^P(E) = \left[y^P\left(\tau^P\right) - y^P\left(\pi\right)\right](1 - \eta) \tag{25}$$

In order to limit redistribution the elite faces a cost $L^E\left(\pi, I\left(y, y^P\right)\right)$ which is larger the lower is the accountability of the government. The constrained optimal level of π therefore solves the problem,

$$\pi^E = \arg \max_{\pi} \left\{(1 - \pi)A^D k^E + \pi A^D \theta\left(\pi\right) k - L^E\left(\pi, I\left(y, y^P\right)\right)\right\} \tag{26}$$

$$\text{s.t.} \quad \pi \in [0, \underline{\pi}(\tau^{Pr})],$$

---

[27]This assumption is rationalized by the fact that this would be the unique result in the case in which limiting importance of the parliament involves any (negligible) cost ε.

where the optimal degree of accountability π identified by (26) either results in an interior solution $\pi^E < \underline{\pi}(\tau^{Pr})$ or a corner solution $\pi^E = \underline{\pi}(\tau^{Pr})$. This means, the elite has to compare the two options π^E and $\pi = 1$. But note that $y^E\left(\pi^E\right) > y^E\left(\underline{\pi}(\tau^P)\right)$ only if it is an interior solution. In other words, a presidential system is profitable only if $\pi^E < \underline{\pi}(\tau^{Pr})$ since if $\pi^E = \underline{\pi}(\tau^P)$ this solution cannot deliver higher indirect utility than the pure parliamentary solution $\pi = 1$. To see this consider the the limit case in which the constrained and the unconstrained solution of (26) coincide so that $\pi^E = \underline{\pi}(\tau^P)$ results from interior first order conditions of (26). In this case the tax rate implemented is given by $\tau^* = \tau^P$ as in the pure parliamentary case $\pi = 1$. But because $L^E\left(1, I\left(y, y^P\right)\right) < L^E\left(\underline{\pi}(\tau^P), I\left(y, y^P\right)\right)$, any constrained optimum is dominated by a pure parliamentary system. Thus, any constrained solution delivers lower utility than the unconstrained one, and a presidential system must imply an interior solution. Therefore, if the elite prefers a presidential system, the optimal level of delegation π^* is implicitly characterized by interior first order conditions to the problem (26),

$$F^E\left(\pi, k, k^E, A^D\right) = 0 \qquad (27)$$

$$\left(y - y^E\right) - \frac{\left(A^D\right)^2\left[(1-\alpha)(1-\pi) - \pi\right]}{(1-\alpha)\left[A^D(1-\pi)\right]^{\frac{2-\alpha}{1-\alpha}}} - \frac{\partial L^E(\pi, I\left(y, y^P\right))}{\partial \pi} = 0$$

Noting that in the range $\pi \in \left[0, \underline{\pi}(\tau^P) = \tau^P\right]$ the net income of the people $y^P(\pi)$ is strictly increasing in π, this implies the following

Lemma 4. *For any $\left\{A^D, k, \mathbf{k}\right\}$ the equilibrium contribution paid by the elite is decreasing in the accountability of the government.*

Proof. Using equation (25) and (13) we have

$$\frac{\partial L^E(\pi, I\left(y, y^P\right))}{\partial \pi} = -\frac{\partial\left(y^P(\pi)(1-\eta)\right)}{\partial \pi} < 0 \qquad (28)$$

since by definition of preferred taxation τ^P then $y^P(\pi)$ is increasing in π in the range $[0, \underline{\pi}(\tau^{Pr})]$. $\square$

Using this first order condition $F^E\left(\pi, k, k^E, A^D\right) = 0$, one can infer how inequality shapes the preferred form of government. Since the optimal choice of π in the presidential system is characterized by optimality conditions, the comparative statics with respect to inequality can be inferred from restricting attention to the interior optimum to the optimization problem. We have the following,

Lemma 5. *For any $\left\{A^D, k, \mathbf{k}\right\}$, the degree of accountability implemented in a presidential system is given by $\pi^E < \underline{\pi}(\tau^{Pr})$ is strictly decreasing with the degree of inequality $I\left(y, y^P\right)$.*

Proof. See appendix. $\square$

Taken together, the last results imply that a presidential system, i.e. a system with $\pi < 1$, can be profitably implemented by the elite only if inequality is sufficiently large.

Proposition 4. *For any $\left\{A^D, k, \mathbf{k}\right\}$, there exists a level of inequality $\overline{I}\left(y, y^P\right)$ such that that for any $I\left(y, y^P\right) \leq \overline{I}\left(y, y^P\right)$ the implemented form of government is fully parliamentary $\pi^* = 1$. Conversely, for any $I\left(y, y^P\right) > \overline{I}\left(y, y^P\right)$ a presidential system with $0 < \pi^E \leq \underline{\pi}(\tau^P)$ can be implemented. The preferred level of accountability in the presidential system is strictly decreasing with inequality, $\partial \pi^E / I\left(y, y^P\right) < 0$.*

Proof. Consider first the case of equality, $I\left(y, y^P\right) = 0$. In this case $\underline{\pi}(\tau^P) = \tau^P = 0$ so that no presidential system can be observed. By Lemma 5, π^E is strictly decreasing with inequality while, from Proposition 3, $\underline{\pi}(\tau^P)$ is strictly increasing in τ^P and therefore inequality with $\underline{\pi}(0) = 0$ and $\underline{\pi}(\tau^P(1)) = \overline{\tau}^P$. Hence, if a presidential system can be profitably implemented, by intermediate value theorem, there must exist a unique level of inequality $I\left(y, y^P\right)$ such that problem (26) delivers an interior solution. $\qquad\square$

Note the difference to the result regarding the effect of inequality on the feasible set given by $\left[0, \underline{\pi}(\tau^{Pr})\right]$, which increases with inequality as $\underline{\pi}(\tau^{Pr})$ increases. The intuition for the fact that the optimally desired level of accountability from the elite's point of view *decreases* with inequality follows directly from the linear progressive taxation. That means, for a given taxation higher inequality imposes a higher cost on the (richer) elite. Hence, the elite prefers (and covers the implementation cost for) a lower level of taxation.

While all the results concerning endogenous constitution and democratization are collected in section 6 we summarize some useful information as

Remark 1. *The form of government is parliamentary for low levels of inequality at the moment of the democratic transition and presidential for larger levels. A presidential system limits redistribution to $\pi < \tau^P$. While in parliamentary systems the level of redistribution increases with inequality this is not the case in presidential systems.*

5 Electoral Systems

In order to study the role and determinants of the form of state, we have so far restricted attention to presidential and parliamentary systems. Details of the electoral rules determining the allocation of the seats in parliament, or likewise the rules according to which the executive is appointed have been neglected. A number of recent papers investigate the role of electoral rules for policy outcomes.

In this section, we extend the analysis and consider two possible alternative electoral systems: majoritarian and proportional voting. This extension allows us to analyze the choice of the form of government jointly with the selection of the electoral system in the game determining the design of the constitution. After introducing a simple voting model we study the problem of policy implementation with different electoral rule and investigate how equilibrium taxation depends on inequality.

5.1 Set up and Electoral Rules

In order to be able to make a meaningful distinction between the two systems while keeping the level of complexity to a minimum, we relax the the simplifying assumption of two groups, and assume the population is formed by three distinct groups of different sizes s^i. In particular, there is an elite making up for a fraction $s^E = \eta$ of the population, a middle class with size $s^M = \mu$, and a group of people of size $s^P = (1 - \eta - \mu)$. As before, the elite is the richest group while the people constitute the poorest group of society. None of the three groups collects the absolute majority of the population and that the elite is not the largest group so that $s_i < 1/2$ for all i. [28] We assume that the middle class is the largest group in society so that $s^M > \max\left\{s^E, s^P\right\}$.[29] The average capital endowment of the elite is intermediate between the one of the elite and the one of the people so that $k^E > k^M > k^P$. Denote the vector collecting groups shares and average

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[28]The case in which one group has the absolute majority would not allow a meaningful distinction between proportional and majoritarian electoral systems with the usual definitions.

[29]This assumption has also been made by Milesi-Ferretti, Perotti, and Rostagno (2002) and Ticchi and Vindigni (2004), among others.

capital endowments as $\mathbf{s} = \{s^E, s^M, s^P\}$ and $\mathbf{k} = \{k^E, k^M, k^P\}$, respectively. The total income of the economy can therefore be expressed as,

$$y = \eta y^E + \mu y^M + (1 - \eta - \mu) y^P \, . \tag{29}$$

In line with the empirical regularity that the median income is lower than the average income, we assume that the income of the middle class is strictly lower than the average income in society, $y^M < y$.

The political process is modelled in a citizen candidate representative democracy framework drawing on Osborne and Slivinski (1996) and Besley and Coate (1997) where all citizens can run for office. Candidates derive a certain utility $e > 0$ if being elected while they have to pay a fix cost $r > 0$ with $e > r$. Denote by p^i the probability faced by an agent of type i of being elected if running. Running for office does not involve any monetary reward so that e represents, for example, a psychological utility received for being elected in the parliament and r the mental effort involved in the candidacy.[30] A candidate rationally decides to run for office if and only if he receives, in equilibrium, a net expected gain so that $(p^i e - r) \geq 0$. This implies that a citizen will run as a candidate only if the probability of winning, p^i, is non zero. Candidates cannot make binding commitments on the policy they will support once elected to the parliament so that the announcement of supporting any policy different from their preferred one is not credible. Voting is sincere so that every individual votes for the candidate among those who endogenously decide to participate, that supports the policy which maximizes individual income.[31]

We need to study the two stages leading to policy setting. In the first stage citizens decide to run for office, voting takes place and the elected candidates form the parliament. In the second stage the decisive majority in parliament is formed within the group of elected representatives, which amounts to set the policy target to be implemented by the executive.

Concerning the first stage, in line with the literature, we model the majoritarian voting as a "winner take all" system in which each voting district elects only one representative while in a proportional system several candidates are elected in any district. As pointed out by several authors these different systems have very different implications for the composition of the parliament even in the case in the distribution of different social groups is similar across districts. Consider a parliament with size $\rho \in (0, 1)$ so that only a fraction ρ of the population can be elected into the parliament. A "party" is endogenously formed by all candidates of the different types running for office. To catch the main difference between the voting systems, we assume that a majoritarian system is composed of ρ districts with identical distribution of voters of the different groups. Each district elects the one candidate collecting the majority of votes. A proportional system, on the contrary, is composed by a unique district in charge of electing ρ candidates. The seats in the parliament are allocated to the different parties in proportion to the votes collected by each one.[32]

The second stage of policy setting is about forming the political majority that makes legislative decisions: inside the parliament the redistribution target is chosen by the party or the coalition of parties collecting the absolute majority of seats. Concerning the formation of the decisive majority we draw on Milesi-Ferretti, Perotti, and Rostagno (2002) and assume that

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[30]Besley and Coate (1997) label this utility benefit as *ego benefit*. Since risk aversion is not important for the problem at hand we take on board the net benefits from holding office by considering a utility formulation with separable and linear utility so that $u = u(c_i, b_i) + (p_i e - r)$.

[31]For simplicity we do not consider the possibility that voters can abstain so that if only one type of candidates run for office they receive all votes. Besley and Coate (1997) consider strategic voting behavior. In our set up the strategic behavior is implemented by the citizens elected in the parliament. This is discussed in more details later on.

[32]Similarly, Milesi-Ferretti, Perotti, and Rostagno (2002) fix the number of representative to 3 and split the population in 3 groups with 3 districts in majoritarian system and one district electing 3 candidates in the proportional one.

the party with relative majority can make an offer to, at least, one other party subject to the constraint that the government maximizes the joint utility of its members. Therefore forming a coalition implies a compromise concerning policies. The party in charge of forming the government makes an offer to a second party only. If this offer is rejected it is still possible to make an offer to the third party. If also this offer is rejected, no coalition is formed and all representatives receive a status quo level of utility $\underline{u}_i$, which we assume to be inferior to the one they can get by reaching any agreement implying any policy τ. As in previous contributions, assuming an inferior status quo implies that even the worse coalition is preferred to non forming a government.[33] This allows us to concentrate attention to the type of coalition emerging in equilibrium.

5.2 Parliamentary State

Majoritarian System. In a parliamentary state with majoritarian electoral systems only one type of candidate optimally decides to run for office. Since the distribution of types in the population is the same among districts, all the districts elect the same type of candidate. For all agents belonging to a different group there is no gain from running without having the probability to win, so no candidate from the other groups runs for office.

Lemma 6. *In a majoritarian system the parliament is formed only by individuals of the middle class and the level of redistribution desired by parliament is given by $\tau^{Pr} = \tau^M$.*

Proof. In equilibrium only citizens from the winner group run for office. If only poor are running an agent belonging to M can run and win (getting the support of the rich). If only the rich run then, again, a candidate from the middle class can win by running. Imagine that candidates from all groups run for office, then a middle class candidate would win. Hence, running for office cannot be optimal for candidates from other groups. Therefore the only equilibrium is when only candidates from group M run for parliament.[34] □

All candidates belong to group M, and by free entry we have $p^M e = r$ so that in equilibrium we have $p^M = 1/a^M$ where a^M is the number of citizens of type M running for office in any district.[35] Since the winning group implements τ^M, in a parliamentary majoritarian system the equilibrium level of redistribution only depends on $I\left(y, y^M\right)$.

Proportional System. In parliamentary proportional systems each party gets a proportion of votes equal to the one of the different types inside the population. Therefore the different

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[33]The status quo utility could be the one associated to repeating the elections, a possibility, which is highly disliked by all elected candidates. Milesi-Ferretti, Perotti, and Rostagno (2002) consider a game in which the social groups differ in the geographical location but not on the across groups distribution of income. While they assume that the prime minister in charge of forming the coalition is selected randomly we the assume that the party in charge of forming the government is the one collecting the relative majority. In fact the agenda setter is not irrelevant for equilibrium selection and, with income inequality, it is reasonable to assign this advantage to the larger party. An alternative coalition formation game is proposed by Ticchi and Vindigni (2004) who assume that if the offer made by the larger party (which in they assume to be the middle class) is rejected, then the offer is made randomly by one of the other two. In both papers the default policy implies a lower utility than any possible agreement.

[34]The result depends of the fact that the middle class desires a level of redistribution which is intermediate between the one preferred by the Elite and the People. To see this note that it would be unchanged even if the poor were the largest groups. In that case if candidates from both types run than the winner is either from M or P depending on group size. But if P wins the other candidates decide not to run in the first place. Since as seen before having only poor running cannot be an equilibrium the only equilibrium is having candidates of group M.

[35]We assume ρ small enough so that each group is composed by more individuals than the available seats inside the parliament: $\rho < \min\{s_i\} \forall i = E, M, P$. In reality ρ is really small since the parliaments contain only a tiny fraction of citizens as representatives.

parties collect a number seats exactly equal to ρs_i which implies that no party has the absolute majority of seats.[36] In this case the largest party, which by assumption is either the middle class or the poor, makes an offer to form a coalition. The preferred level of redistribution chosen by a given coalition maximizes the joint utility (income) of its members.[37]

Denote by τ^{ij} the level of redistribution preferred by a majority in parliament that is formed by parties i and j. This is given by,

$$\tau^{ij} = \underset{0 \leq \tau \leq \overline{\tau}(A^D, k)}{\arg\max} \left\{ s^i \left[(1-\tau) y^i + T(\tau) \right] + s^j \left[(1-\tau) y^j + T(\tau) \right] \right\} . \tag{30}$$

Denote the average income of the members of a coalition formed by groups i and j by,

$$y^{ij} = \frac{s_i}{s_i + s_j} y^i + \frac{s_j}{s_i + s_j} y^j , \tag{31}$$

and, analogously to the inequality index (14) for the different groups, denote the income difference between average income and the income of a coalition formed by party i and j by

$$I\left(y, y^{ij}\right) = \left(1 - \frac{y^{ij}}{y}\right) \sim \left(y - y^{ij}\right) . \tag{32}$$

The policy preferred by a coalition is therefore characterized by,

$$\tau^{ij} = \arg \underset{0 \leq \tau \leq \overline{\tau}(A^D, k)}{\max} \left\{ (1-\tau) y^{ij} + T(\tau) \right\} (s_i + s_j) \tag{33}$$

Similarly to the individual problem (11) equation (33) delivers a corner solution with τ^{ij} if $y^{ij} > y$ and $\tau^{ij} \in \left(0, \overline{\tau}\left(A^D, k\right)\right]$ for $y^{ij} \leq y$ with redistribution being increasing in $I\left(y, y^{ij}\right)$.

Contrary to the majoritarian system the equilibrium policy emerging in a proportional system changes depending on the equilibrium coalition, which itself turns out to depend, in particular, on the level of inequality. The proportional system is characterized, by its nature, by equilibrium target policies which compromise between the level of redistribution preferred by each party. The level of redistribution maximizing the joint utility of the coalition members depends on the average level of income in the coalition y^{ij} which depends on both per capita income of the different social groups and their size. The preferences over coalitions of the groups with extreme positions can therefore be ranked according to y^{ij}. In the case of the elite, the net income of its members is strictly decreasing with the level of redistribution. Therefore, from (33) the coalition preferred by the elite is the one with larger average income. Depending on the income and sizes of the different groups the elite may prefer to form a coalition either with the middle class or the poor. Symmetrically, the people are the poorest group in society and their net income is strictly increasing in taxation (for all $\tau < \tau^P$). Therefore the coalition preferred by the people is the one with the lowest possible income.

Since the parliament can, by assumption, perfectly control policy implementation, the announced target will coincide with the implemented redistribution, and any coalition will set the announced target to its preferred level.

The average income of a center-right coalition between the middle class and the elite is always larger than the income of the middle class which, in turn, is larger than the average income of a center-left coalition between the middle class and the people: $y^{EM} > y^{MP}$. By equations (11)

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[36]This is the case since by sincere voting and free entry of candidates in equilibrium each individual of type i running for office faces a probability of getting elected equal to $p^i = \rho s^i / a^i$ where a^i is the number of equilibrium candidates.

[37]Entering the details of the bargaining process inside the coalition is beyond the scope of this paper.

and (33) this implies that, for any $\{\mathbf{s}, \mathbf{k}\}$, the level of redistribution maximizing the joint utility of the coalition members is larger for middle class-people coalitions:

$$\tau^{MP} > \tau^{EM} \geq 0 \tag{34}$$

We denote by $\succeq^i$ the (weak) preference of group i over coalitions so that, e.g., $E \succeq^P M$ reads the people prefer to form a coalition with the elite than with the middle class. As a consequence of the previous result, we can note the following

Remark 2. *In a parliamentary state with proportional electoral system, for any $\{\mathbf{s}, \mathbf{k}\}$, $y^E\left(\tau^{ME}, \mathbf{s}, \mathbf{k}\right) > y^E\left(\tau^{MP}, \mathbf{s}, \mathbf{k}\right)$, and $y^P\left(\tau^{ME}, \mathbf{s}, \mathbf{k}\right) < y^P\left(\tau^{MP}, \mathbf{s}, \mathbf{k}\right)$.*

This remark implies that both the elite and the people always accept an offer by the middle class to form a coalition, rather than declining it and be excluded from the decisive majority in parliament. Consequently, the middle class is always able to choose their most preferred coalition partner, knowing that the coalition will in fact be formed. As a direct consequence, we have the following,

Lemma 7. *In a parliamentary state with proportional electoral system, for any $\{\mathbf{s}, \mathbf{k}\}$, the only possible equilibrium coalitions are given by $\{E, M\}$ which is the case if $E \succeq^M P$ and by $\{M, P\}$ if $P \succeq^M E$.*

Consequently, the following result emerges,

Lemma 8. *In a parliamentary proportional electoral system, for any $\{\mathbf{s}, \mathbf{k}\}$ the equilibrium coalition is center-right (middle class - elite) or center-left (middle class - people) depending on*

$$P \begin{array}{c} \succeq \\ \prec \end{array}^M E \iff y^M\left(\tau^{MP}\right) \gtrless y^M\left(\tau^{EM}\right) . \tag{35}$$

The respective level of redistribution set by the different coalitions is then either τ^{MP} or τ^{EM} with,

$$\tau^{MP} > \tau^{EM} \geq 0 . \tag{36}$$

The equilibrium coalition mirrors the preferences of the middle class. Therefore we can concentrate on the conditions under which the middle class prefer to form a coalition with the elite or the poor. The choice of τ^M implies an optimal balance between the redistribution and the distortion from taxation. When choosing a coalition the middle class attempts to make the smaller possible deviation from the optimal choice. When forming a coalition with the elite and the people they obtain a level of redistribution which is too small, respectively too large, with respect to their preferred one. The difference between the preferred policy of the elite and the middle class depends on the gap $\left(y - y^M\right)$ since the larger the difference between average and median income the larger the level of τ^M. In fact while this income gap is fully informative about equilibrium policy in majoriatarian systems this is not the case in proportional ones where equilibrium coalition depends both the difference between the income of the middle class and the average and the middle class and the poor. Consequently it is not sufficient to consider the income gap between the median and the average income since the emerging coalition depends on the entire income distribution. To investigate the role of the income distribution we need to consider both the income difference $\left(y^M - y^{EM}\right)$ on one hand and on $\left(y^M - y^{MP}\right)$ on the other. Roughly speaking the middle class prefers the coalition with the average income which is "closer" to y^M. Consider first an economy with both $I\left(y, y^M\right)$ and $I\left(y, y^{MP}\right)$ being very large which implies that both the income of the middle class and the average income of the

$\{M, P\}$ coalition are close to each other and substantially smaller than the average income. In this economy characterized by large inequality it is likely to observe an $\{M, P\}$ coalition.[38] Coalitions $\{E, M\}$, on the contrary emerge if the income of the median voter y^M is not too far away from the average and it is sufficiently larger than the income of the poor.

Consider a change in the inequality index $I\left(y, y^M\right)$ which leaves average income unchanged, e.g. in the form of a mean preserving spread.[39] In an economy in which the income of the middle class and average income coincide the emerging coalition is $\{E, M\}$. This is the case since if $I\left(y, y^M\right) \to 0$ then $\tau^M \to 0$ which implies that for any $y^P < y^M$ the middle class prefers to form a coalition with the elite since they both prefer zero redistribution. Nonetheless redistribution is increasingly appealing for the middle class as $I\left(y, y^M\right)$ gets large. In fact as $I\left(y, y^M\right) \to 1$ then $\tau^M \to \tau^P$ which implies that there is a level of inequality $I\left(y, y^M\right)$ large enough to induce the middle class to prefer a coalition with the poor. This discussion is recorded in,

Remark 3. *In a parliamentary proportional system the equilibrium coalition is given by $\{E, M\}$ for low levels of $I\left(y, y^M\right)$ and by $\{M, P\}$ for high levels of $I\left(y, y^M\right)$.*

Following the conventional interpretation of $I\left(y, y^M\right)$ as measure of inequality, we observe $\{E, M\}$ coalitions for low enough, and $\{M, P\}$ for low enough, inequality. The previous remark also highlights the role of size and income share of the middle class. The larger the middle class and the share of income received by this group the larger the contribution to y which implies a small $I\left(y, y^M\right)$.

These results about policy formation in parliamentary systems are recorded in

Lemma 9. *For any $\left\{A^D, \mathbf{s}, \mathbf{k}, \pi\right\}$ the equilibrium level of redistribution in a **parliamentary** democracy with a **majoritarian** system is given by τ^M while the equilibrium level of redistribution in a **proportional** system is given by τ^{Mj} where $j = E$ if $E \succeq^M P$ and $j = P$ if $P \succeq^M E$.*

5.3 Presidential State

We now turn to the investigation of policy implementation in presidential systems with different electoral rules. As before, we solve the policy implementation game backwards.

Lobbying Outcome. Since under presidential systems the accountability is not perfect with $\pi < 1$, the equilibrium policy can differ from the target set by the parliament. Consider first the equilibrium in the lobbying game. As in the two groups case the winner of the lobbying game implements his preferred level of redistribution for any target level of redistribution set by the parliament τ^{Pr}. Therefore the equilibrium tax rate is the lowest if the elite wins the lobbying game and the highest if the poor succeed. The fact that the policy preferred by the elite is less distortionary implies the general result that the elite is willing to mobilize more resources for political influence and they are successful in the lobbying game even with more than two groups. This is stated in,

Lemma 10. *In any electoral system, for any target policy set by the parliament $\widetilde{\tau}^{Pr}$ and any π, the elite always wins the lobbying game by offering a contribution equal to*

$$\max\left\{\Delta y^M(E), \Delta y^P(E),\right\}$$

so that $\tau^G = 0$ and the equilibrium level of redistribution is given by $\tau^* = \widetilde{\tau}^{Pr}\pi$.

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[38]Note that if $y - y^M$ is large then inequality is large if we measure it by both the indices used in the text or standard measures like e.g. the Gini index.

[39]Several comparative statics exercises can be performed to study the role of inequality over policy setting. The exercise performed here has the virtue of being comparable to the one of the two groups case. Moreover, it also allows to highlight the key role of the middle class.

Proof. See appendix. □

We have just shown that the elite group will always win the lobbying game for any possible $\widetilde{\tau}^{Pr}$ chosen by the parliament.[40] At the moment of forming coalitions the different parties anticipate the equilibrium of the lobbying game and behave strategically.

Proportional System In presidential states with a proportional electoral system the coalition forming the political majority in parliament can strategically delegate the implementation of a given target to the executive. As in the benchmark case it is clear that any tax rate τ^{Pr} can be implemented only if $\tau^{Pr} < \pi$. Consider now the coalition formation stage in a presidential system, i.e. with $\pi < 1$. For any given $\{\mathbf{s}, \mathbf{k}\}$ and A^D the coalition may or may not be successful obtaining the preferred policy by strategically delegating the executive.

If the level of accountability is large enough so that $\pi > \tau^{MP} > \tau^{EM}$ then the coalition formation game coincides with the one in a parliamentary system and the emerging coalition can implement the policy τ^{ij} announce a policy target equal to $\widetilde{\tau}^{Pr} = \tau^{ij}/\pi$. For intermediate levels of accountability $\tau^{MP} > \pi > \tau^{EM}$ the equilibrium redistribution implemented under a $\{M, P\}$ coalition can be limited to $\tau^{MP} = \pi$. It is clear that, in this situation, if the middle class prefers to form a coalition with the poor in a parliamentary system this is true, *a fortiori*. The introduction of a limit to redistribution can, nevertheless, lead to the emergence of $\{M, P\}$ coalition even if a $\{E, M\}$ would be implemented in pure parliamentary system. This is the only case in which, given a certain income distribution, the tax rate implemented in a presidential state is higher than the one implemented in a parliamentary state, since $y^M(\pi) > y^M(\tau^{MP}) > \tau^M(\tau^{EM})$.[41] In this case the equilibrium taxation is given by $\tau^{Pr} = \pi$ otherwise $\tau^{Pr} = \tau^{EM}$. Finally if the executive is sufficiently independent we have $\tau^{MP} > \tau^{EM} > \pi$ which implies that $\tau^{Pr} = \pi$ no matter the equilibrium coalition. In this context the large level of independence of the executive from the parliament makes the equilibrium coalition irrelevant for equilibrium policy.

Majoritarian System. A similar reasoning applies for a presidential state with a majoritarian system where equilibrium redistribution is either τ^M or π. This information is collected in,

Lemma 11. *For any $\{A^D, \mathbf{s}, \mathbf{k}, \pi\}$ the equilibrium level of redistribution in a **presidential** democracy with a **majoritarian** system is given by,*

$$\min\{\tau^M, \pi\} \tag{37}$$

*while the equilibrium level of redistribution in a **proportional** system is given by,*

$$\min\{\tau^{Mj}, \pi\} \tag{38}$$

where $j = E$ if $E \succeq^M P$ and $j = P$ if $P \succeq^M E$.

In presidential systems the role of inequality depends on the degree of accountability π. If the degree of accountability is large enough then the process of strategic delegation allows the parliament to control policy as in pure parliamentary system and the equilibrium policy depends on both the electoral rule and the distribution of income.[42] For intermediate levels of

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[40]In fact, for the very same reasons the elite would win even if we were to allow coalitions between different groups in the lobby game. This possibility, which is typically non considered in the literature, would not change the result.

[41]Limiting taxation to π may also induce the elite to form a coalition with the poor by keeping redistribution close to their preferred level, but this is not feasible under the current framework.

[42]In fact, we could also call all systems parliamentary in which the parliament can closely control the policy (which is the case for large enough π) and call all systems presidential in which this strategic delegation is limited by low accountability of the executive.

independence and accountability, the policy is partially insulated from inequality and electoral rules. This is the case when, e.g. the implemented policy is $\tau = \pi$ with a coalition between middle class and poor which is feasible due to the limits to redistribution. Finally, if accountability is low enough policy implementation is fully independent from both electoral rules and the level of inequality.

For intermediate levels of accountability and concerning the role of inequality for coalition formation the only relevant difference is that coalitions $\{M, P\}$ can be formed for smaller levels of inequality as measured by $I\left(y, y^M\right)$ and even if the people are poorer so that the income y^{MP} is smaller. In this case the equilibrium level of redistribution is bounded from above and this allow to the middle class to profitably form a coalition with the poor also in the cases in which the middle class do not want to tax too much. Finally if the accountability of the executive is too small then the parliament looses the control over equilibrium policies. In this case the policy implemented does not respond to inequality and it is insulated from coalition formation.[43] Having characterized the equilibrium policy as a function of the political system we now turn to the endogenous emergence of the constitution.

6   Endogenous Constitutions

In this section we study which constitution endogenously emerges from the process of democratization both in terms of *form of state* and the *electoral system*. We investigate the role of inequality in determining both the democratic transition and the constitutional details. The section also summarizes the main results in terms of policy implemented on the different systems and on the dynamic evolution of inequality after the writing of the constitution.

As in the benchmark we investigate which constitution would emerge, if at the moment of democratization, the elite can make an offer on the constitutional details. The elite have the possibility to offer a form of state with limits to accountability which allows them to limit equilibrium redistribution. The main results of section 4 are valid also when considering explicitly the different electoral rules. The form of government and the electoral rule preferred by the elite is the one maximizing the net income of this group. The income received by the elite in a parliamentary system is given by

$$y^E\left(\tau^{Pr}, A^D\right) = \left(1 - \tau^{Pr}\right) A^D k^E + \tau^P A^D \theta\left(\tau^{Pr}\right) k, \tag{39}$$

where τ^{Pr} is the equilibrium level of redistribution and depends on inequality, the electoral system and possibly the level of π itself.[44]

Consider first the choice of the electoral rule preferred by the elite conditional on implementing a *parliamentary* system. For a given distribution of income, the elite prefers the electoral system implementing the lower equilibrium redistribution. Lemma 9 and equation (34) imply that the elite prefers a proportional system to a majoritarian one if the emerging coalition is between themselves and the middle class. Therefore by remark 3 conditional on choosing a parliamentary form of government the proportional rule is chosen for low levels of inequality when the income of the middle class is sufficiently close to the average while the majoritarian system is preferred for larger levels of inequality. Therefore,

Remark 4. *The electoral rule that would be chosen by elite in a parliamentary democracy τ_E^{Pr} is the one that minimizes the level of redistribution*

$$\tau_E^{Pr} = \min\left\{\tau^M, \tau^{Mj}\right\} \tag{40}$$

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[43]Whenever $\tau^{MP} > \tau^{EM} > \pi$ we also have $\tau^M > \pi$ which implies that the equilibrium policy is $\tau^* = \pi$ independently of both income inequality and the electoral system.

[44]As seen above for intermediate levels of inequality the middle class may form a coalition with the poor only if π is small enough.

where Mj is the equilibrium coalition emerging in a proportional system.

Instead, the income received by the elite in a presidential system is given by,

$$y^E \left(\pi^E, A^D \right) = \left(1 - \pi^E \right) A^D k^E + \pi^E A^D \theta \left(\pi^E \right) k - L \left(\pi^E, I(y, y^P) \right), \qquad (41)$$

A presidential system is appealing for the elite only if it helps limiting redistribution which, as in equation (23), is the case only if $\pi < \underline{\pi} \left(\tau^{Pr} \right) = \tau^{Pr}$. Therefore, as in the benchmark, the constitution is either characterized by a pure parliamentary system $\pi = 1$ or by a presidential system in which $\tau^* = \pi < 1$. Which electoral rule will be chosen if the elite offers to implement a presidential system? From inspection of equation (26) the level of π representing the unconstrained extremum of the income of the elite does not depend on the target tax set by the government. Nonetheless the range over which the elite can influence policy implementation is given by $\pi < \underline{\pi} \left(\tau^{Pr} \right)$ which is a function of the target set by the parliament. This implies that in a presidential system the electoral rules influence the magnitude of the maximum level of accountability $\underline{\pi} \left(\tau^{Pr} \right)$, i.e. the feasible set of presidential systems, but not the optimal degree of equilibrium accountability in the case a presidential system is chosen, π^E. If $\pi^E < \underline{\pi} \left(\tau^{Pr} \right)$ for both τ^{Pr} emerging in proportional and majoritarian systems then the elite is indifferent between any electoral rule. Nonetheless it may be the case that $\pi^E > \underline{\pi} \left(\tau^{Pr} \right)$ for one of the electoral rules. In this case the elite prefers the electoral rule inducing the parliament to set the largest target policy. This allows to conclude that, in a presidential system, for any given income distribution the elite prefers the electoral rule leading to a larger redistributive target set by the parliament since the larger the target the larger is the degree of accountability $\underline{\pi}$ needed by the parliament in order to control policy.[45] Therefore as was shown in Proposition 4, a presidential system characterized by $\tau^* = \pi$ can be implemented only if inequality is sufficiently large, while a parliamentary system is preferred for low enough inequality. This is result still holds even when the constitutional details involve the choice of the electoral system.

Proposition 5. *For any $\left\{ A^D, k, \mathbf{k} \right\}$, there exists a level of inequality $\overline{I} \left(y, y^M \right)$ such that that for any $I \left(y, y^M \right) \le \overline{I} \left(y, y^M \right)$ the implemented form of government is fully parliamentary $\pi^* = 1$ and the electoral rule is proportional for low $I \left(y, y^M \right)$ and majoritarian for larger $I \left(y, y^M \right)$. Conversely, for any $I \left(y, y^M \right) > \overline{I} \left(y, y^M \right)$ a presidential system with $1 < \pi^E \le \underline{\pi}(\tau^{Pr})$ can be implemented independently of the electoral rule.*

Proof. The proof is similar to the one of Proposition 4. Consider first the case of equality, $I \left(y, y^M \right) = 0$. In this case $\underline{\pi}(\tau^{Pr}) = 0$ both in a proportional and in a majoritarian parliamentary system. In this case no presidential system can be observed. By Lemma 5, π^E is strictly decreasing with inequality while, from Proposition 3, $\underline{\pi}(\tau^{Pr})$ is strictly increasing in τ^{Pr} and therefore inequality with $\underline{\pi}(0) = 0$ and $\underline{\pi}(\tau^{Pr} (1)) = \overline{\tau}^P = \overline{\tau}^M$. Hence, if a presidential system can be profitably implemented, by intermediate value theorem, there must exist a unique interior level of inequality $I \left(y, y^M \right)$ for which the optimum degree π^E is characterized by first order conditions. $\qquad \square$

Concerning the relationship between inequality and policy implementation in the different political system we record the previous results in,

Proposition 6. *For any $\left\{ A^D, A^O, \mathbf{k} \right\}$, (i) redistribution in parliamentary systems τ^{Pr} depends on the electoral rule and on inequality. (ii) Redistribution in presidential systems depends on the degree of accountability π but not on the electoral rule or the degree of inequality. (iii) Presidential redistribute less than parliamentary systems, since $\tau^{Pr} > \pi$ and this implies that (iv) dynamically, inequality is more persistent under presidential than under parliamentary systems.*

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[45] As in the benchmark if $\pi^E > \underline{\pi} \left(\tau^{Pr} \right)$ for all electoral rules the elites strictly prefer the pure parliamentary system.

Proof. The claim follows since, due to condition (16) and redistribution is always higher in parliamentary than in presidential systems, implying a larger equalization of incomes. $\qquad\square$

The last claim has wide-ranging implications, since the choice of constitution reinforces the initial difference in inequality. Presidential systems arise for initially larger levels of inequality. These persist overtime due to the low degree of redistribution, while inequality, which is initially low, in parliamentary systems decreases faster due to larger redistribution. Therefore, for similar economic environments and development paths, the difference between inequality in presidential and parliamentary systems should increase.

We finally go back to the investigating the endogenous constitution in the process of democratization. With these results, we can now come back to the elite's problem of making a democratic offer and characterize the conditions under which this offer takes place. For any given $\left\{A^D, A^O, \mathbf{k}\right\}$ the elite initiates a democratic transition if and only if,

$$A^O k^E < \max \left\{y^E\left(\tau^{Pr}\right), y^E\left(\pi^E\right)\right\}, \tag{42}$$

where $y^E\left(\tau^{Pr}\right)$ and $y^E\left(\pi^E\right)$ are defined in equations (39) and (41). Democratization takes place only when the net rent increase in passing to democracy is large enough which is the case only once the technology is sufficiently developed and physical capital is sufficiently abundant.[46] In fact for any degree of inequality there always exists a level of productivity A^D and availability of capital that makes democratization optimal for the elite. One can easily endogenize the level of technological change in the view of endogenous growth theories and obtain an endogenous transition to democracy.[47] This implies that eventually democratization takes places. Nonetheless the larger inequality the longer the time spell necessary to make a democracy appealing for an elite. Consider $I^D\left(y, y^M\right)$ for which the elite is indifferent between democracies and oligarchy so that equation (42) holds with equality. Any increase in inequality $I\left(y, y^M\right)$ weakly increases the left hand side of (42) while the right hand side decreases (weakly) since both $y^E\left(\tau^{Pr}\right)$ is smaller due to the increase in equilibrium redistribution and $y^E\left(\pi^E\right)$ is smaller due to the larger cost of lobbying. The contrary is true for an inferior level of inequality. In fact, as seen above, when inequality is nil democratization is always the best option for the elite. This discussion is recorded in,

Proposition 7. *For any level of development $\left\{A^D, k\right\}$ there exists a level of inequality $I^D\left(y, y^M\right)$ such that for any $I\left(y, y^M\right) < I^D\left(y, y^M\right)$ the elite offers democratization while for any $I\left(y, y^M\right) > I^D\left(y, y^M\right)$ the elite prefers oligarchy.*

These last results taken together impliy that democratization takes place endogenously once the economy is sufficiently developed.[48] Nonetheless the timing of this events depends on the degree of inequality. For any level of development there exists a level of inequality $I^D\left(y, y^M\right)$, which makes democratization possible and more unequal economies democratize later on in

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[46]In fact overtime physical capital tend to increase due to the endogenous bequests.

[47]For example consider the case in which total factor productivity increases endogenously as a function of the level of capital and previous technological level. For example similar to technological externalities in Romer (1990) consider,

$$\frac{A_t - A_{t-1}}{A_t} = F\left(\overset{+}{k_t}, \overset{+}{A_{t-1}}\right)$$

and that in oligarchy a part of productivity is foregone with respect to democracies so that $A^O = A^D \varphi$ with $\varphi < 1$. This would imply that eventually the technological level and the level of capital (which grow unboundedly) are large enough to induce a democratization for any degree of inequality.

[48]Note that the process of democratization is, in this framework, irreversible since no group has an incentive to give up *de jure* political power once it is obtained.

time. At the moment of democratization the emerging constitution is presidential if $\overline{I}\left(y, y^M\right) < I^D\left(y, y^M\right)$, and parliamentary if $\overline{I}\left(y, y^M\right) > I^D\left(y, y^M\right)$.

The next section is devoted to the empirical investigation of the main assumptions and theoretical predictions.

7   Empirical Relevance

This section considers empirical evidence concerning several assumptions underlying the theoretical framework as well as concerning the testable implications. We begin the empirical analysis by comparing our results to previous findings in the literature, before describing and analyzing cross-country data from different sources.

7.1   Previous Findings

The assumptions, implications and predictions of the theoretical model touch upon several strands of empirical literature. The question whether economic development facilitates democratization or vice versa has been a long-standing research question. By now, it seems fair to say that there is evidence for both directions of causality. In particular, Barro (1999), Boix (2003) and Boix and Stokes (2003) find that economic development increases the propensity of democratic transitions (or extensions of democratic rights), while Przeworski *et al.* (2000) find that economic development stabilizes democracies. On the other hand, Rodrik, Subramanian, and Trebbi (2004) and Rigobon and Rodrik (2004) provide evidence that political institutions are also causally, or at least instrumentally, beneficial for economic development. The results of Glaeser, LaPorta, Lopez-De-Silanes, and Shleifer (2004) suggest that the impact of political institutions might not be direct, but rather materialize through the fact that under certain constitutional arrangements better economic institutions can be adopted than under others.

That inequality is a crucial determinant of economic and political development in the long run has been argued most prominently by Engerman and Sokoloff (1997, 2001) in the context of the differential development of the Americas.[49] Easterly (2001) has provided evidence for their argument. The theoretical results in this paper are in line with this view.

A recent literature, most prominently represented by the work of Persson and Tabellini (2003, 2004) investigates the consequences of constitutional design on economic policy and economic outcomes. By now, most of the evidence suggests that presidential systems and majoritarian voting rules imply lower taxation and lower levels of redistribution. This is consistent with our theoretical results. Recent findings by Gradstein and Chong (2004) also confirm our results and suggest that inequality causally affects the quality of institutions, in the sense of civil liberties, corruption, law and order, and democratic accountability, and that institutions in turn causally affect inequality.

In addition to providing and citing evidence from different sources, and in order to confront the model with empirical evidence in a coherent way, we finally conduct some empirical tests ourselves. For the other, so-far untested predictions and implications of our model.

7.2   Data

The main difficulty in testing assumptions and predictions of the model lies in the data that can be used for that purpose. First, there are only few countries in the world that can be used, so sample sizes are limited to less than 100 observations. Moreover, democratic transitions, as well as major constitutional changes are rare events, which essentially forces us to use a

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[49]See also Justman and Gradstein (1999) for a similar argument in the historical context of Britain.

cross-sectional data set. Finally, in order to evaluate the theoretical implications, one would ideally require information on the respective variables at or around the time of the democratic transition and the design of the (first) democratic constitution. However, such data that are of comparable quality across countries and democratization experiences are not easily available. Since we are aware of these and further problems, the following empirical analysis is thought as a first check whether the theory is in line with empirical findings rather than contradicting them, but it should not be viewed as 'hard' econometric testing of the theory. Nevertheless, we think that it is helpful to confront the theory with available data. Due to the problems mentioned before, we construct a comprehensive cross-sectional data set using cross-country information for the 1990s from several sources. We will then use instrumenting techniques that have been used in the literature to circumvent problems of not having data on the time of transition, and to deal with problems of endogeneity and reverse causality.

The basis for the analysis is the cross-country data set that was collected by and analyzed by Persson and Tabellini (2003, 2004). These data contain economic and demographic information for 85 countries and their political structure as of the 1990s. [50] The variables central to the current analysis are indicators for form of government and the electoral system. The form of government is classified as a presidential system ($pres = 1$) if the executive, the government or cabinet, is *not* accountable to the legislature through a vote of confidence. Parliamentary systems ($pres = 0$) are characterized by accountability of the executive to the legislative. In none of the 85 countries has the constitution been changed after 1960 in order to change the form of government. Voting systems are characterized as majoritarian, $maj = 1$, and proportional, $maj = 0$, where mixed systems are also treated as proportional. Also changes in voting systems are rare in the after-1960 period, but some countries have changed their voting system. The main redistributive policies under investigation are the ratio of central government spending (including social security) as percentage of GDP, denoted *cgexp*, and social security and welfare spending as percentage of GDP, denoted *ssw*, respectively. Income inequality is measured as the average Gini-Index between 1980 and 1990. The data contain further information on economic and demographic structure, legal origin, colonial history, as well as several geographical variables. A detailed variable description is provided in the appendix B below.

These data were enriched by combining them with data set used by Easterly (2001).[51] These data also contain cross-country information for the 1990's. The particular variables used in this analysis are the share of income going to the middle class, as measured by the quintiles 2,3 and 4, *quintile*, which constitutes an alternative measure for inequality and the importance of the middle class in a society. Other information are a dummy for tropical location *tropics*, and dummies for non-oil commodity and oil exporting, *commodity* and *oil*.[52] In his analysis, Easterly (2001) empirically confirms the hypothesis by Engerman and Sokoloff (1997) that tropical location leads to commodity production, and that commodity production in turn is associated with higher inequality.[53]

We use estimates on the size of the shadow economy in 145 countries in 1999/2000, provided by Schneider (2004). The data represent estimates of the size of shadow economies as percentage

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[50]See Persson and Tabellini (2003, 2004) for a detailed description of the data, the variables, and the data sources. The data are available at
http://rincewind.iies.su.se/ perssont/datasetselectoralrules.htm.

[51]The data are available at
http://www.nyu.edu/fas/institute/dri/Easterly/Research.html.

[52]The tropical dummy indicates whether a country is on average has mean absolute latitude of less than 23.5 degrees. Commodity and oil exporting dummies indicate whether 50 percent or more of a country's exports are in non-fuel primary products or fuel, respectively.

[53]Apart from showing the correlation, Easterly justifies the use of tropical location and commodity exports as valid instrument for inequality in growth regressions.

of GDP, where shadow economies are broadly defined as including "those activities and the income derived from them that circumvent ... government regulation, taxation or observation".[54]

We extend our data sets by adding data from the Global Development Network Growth Database of the World Bank, provided by William Easterly and Mirvat Sewadeh. The data contain cross country information on different dimensions of taxation for the 1990s.[55] Finally, we add data on land inequality in 1960 and 1970 from the Inter-university Consortium for Political and Social Research (ICPSR) Study 7761 undertaken by the University of Michigan.[56]

7.3 Empirical Evidence

The main theoretical results to be confronted with data are those contained in Propositions 4 and 6. Before considering the details of the constitutional design, however, we first investigate whether the assumption concerning the distortions that arise from taxation by deterring economic activity and providing incentives for employing resources in the informal sector is in line with empirical findings. That higher taxes and social security contributions lead to increasing importance of shadow activities and a growing shadow economy is a robust finding in the literature, see Schneider and Enste (2000). Using estimations of the size of the shadow economy in a large sample of countries provided by Schneider (2004) as a dependent variable, we run regressions using explanatory variables like measures of the level of development, and redistribution. The results, which are contained in Table 1 confirm the theoretical presumption. In particular, larger states implying larger tax burdens, as measured by the expenditures of the central government as share of GDP, by the size of the welfare state, or by larger average tax rates on goods imply larger shadow economies. We abstain from giving a causal interpretation due to the small sample sizes and the aggregate nature of the data, but the data are clearly suggestive, and are in line with our assumption.

Turning to the implications of our theory, consider the conditions needed for a democratic transition, namely a sufficiently high level of development and, in particular, a sufficiently low level of inequality. Since we have no information on inequality around the transition, we follow Easterly (2001) in testing and using the hypothesis proposed by Engerman and Sokoloff (1997) that tropical location favors commodity production, which in turn is associated with higher inequality. While Easterly uses tropical location as an instrument for current commodity production and inequality, we argue that this instrument should be equally valid when speaking about earlier periods, in particular the period around the democratic transition. Using Easterly's data set, we estimate a system of equations by Three-stage least squares (3SLS) in which the share of middle class income as fraction of GDP, as measure of equality (and importance of the middle class), is explained by a commodity dummy and a dummy for oil exporting, while the commodity dummy is instrumented using dummies for tropical location and oil exporting. The results are depicted in Table 2. As noted by Easterly, tropical location is a good predictor for commodity production, which seems to have a large effect on the income share appropriated by the middle class. These results are completely equivalent when instrumenting income inequality in terms of a Gini-index, rather than middle class income shares.[57]

We next use this instrument in a system, which includes a regression of a dummy for a democratic structure as defined by Persson and Tabellini (2004). The specification is parsimonious,

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[54]See also Schneider and Enste (2000).

[55]The data are available at

`http://www.worldbank.org/research/growth/GDNdata.htm`. To make the data comparable, we use averages for the years 1990-1998.

[56]The data are taken from the World Handbook of Political and Social Indicators III: 1948-1982 Taylor, Charles Lewis, Jodice, David A., and are available at

`http://www.icpsr.umich.edu/access/index.html`.

[57]Detailed results are available upon request.

Table 1: Determinants of the Shadow Economy

Dependent Variable	(1) Shadow Economy (as % GDP)	(2) Shadow Economy (as % GDP)	(3) Shadow Economy (as % GDP)
Explanatory Variables			
log(GDP90)	-10.454**	-14.328**	-20.003**
	(4.030)	(6.095)	(7.619)
Ethnic Fractionalization	0.057	0.072	0.038
	(0.072)	(0.065)	(0.074)
Central Gov. Exp.	0.300**		
	(0.142)		
Social Spending and Welfare		0.745**	
		(0.343)	
Average Taxes on Goods (1990-1998)			0.901**
			(0.370)
Observations	50	41	41
R-squared	0.72	0.79	0.75

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from OLS estimations. Data on Central Government Expenditures and Social Spending are taken from Persson and Tabellini (2004), data on goods taxes are from the Global Development Network Growth Database of the World Bank, see footnote 55. Other explanatory variables in specifications (1), (2) and (3) are: Ethnic Fractionalization, share of time at civil war 1960-89, civil liberty 1988, share of agriculture in GDP 1990, Urbanization ratio 1990, and continental dummies.

and does not include information for colonial origin, since such information is not included in the original data set of Easterly. The estimation results obtained by Three-Stage-Least Squares (3SLS) regression are contained in Table 3. Lower inequality and lower fragmentation make democracies more likely to arise. Very similar results arise if instead of a democratization dummy indices for the quality of political structures or political freedom are used.[58]

Having established a positive correlation between democratic structures and the levels of development and equality, respectively, we now turn to the design of democratic constitutions. In particular, we want to investigate the role of inequality for the type democratic structures, in particular the form of state and the electoral system. In order to do that, we estimate a system similar as the previous one, replacing the equations for income and democracy by an equation for presidential systems (dependent variable equals 1 if the system is presidential and 0 if parliamentary). As additional exogenous explanatory variables we follow Persson and Tabellini (2004) and add controls for colonial and legal origin, as well as for the age of the democracy to control for constitutional 'fashions'. The results are shown in Table 4. The findings are consistent with the theory. In particular, countries with a larger share of middle class income, i.e. lower inequality, are more likely to exhibit a presidential system. We also run an extended system by adding another equation for the electoral system, with the dependent variable being an indicator for majoritarian (as opposed to parliamentary) electoral rules, and the same set of explanatory variables. The results are reported in Table 5 and show that, somewhat surprisingly, inequality remains a significant determinant of presidential systems, but not for electoral rules. In light of our theoretical results, in particular Proposition 6, this should not be too surprising, however. In particular, these results would predict that inequality matters predominantly for electoral rules conditional on a parliamentary form of state, but not so much under a presidential regime.

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[58]Democracies are defined as in Persson and Tabellini (2004) as societies with sufficiently high levels of indices of civil liberties and political rights, so-called Gastil and PolityIV-Project indices. Detailed results are available upon request.

Table 2: Middle Class Income Share and Location

Dependent Variable	Commodity	Middle Class Share
Explanatory Variables		
Tropical Location	0.383***	
	(0.072)	
Oil Exporting	-0.305**	-10.876***
	(0.153)	(4.035)
Commodity		-19.612***
		(4.811)
Constant	0.050	51.627***
	(0.051)	(1.461)
Observations	101	101

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location and Oil Exporting Dummy. Endogenous variables are Commodity Producing Dummy and income share of middle class. Standard errors are in parentheses. Significance at 10, 5 percent and 1 percent level is indicated by *, ** and ***, respectively.

Table 3: Inequality and Democratization

Dependent Variable	Commodity	Middle Class Share	Democracy
Explanatory Variables			
Tropical Location	0.342***		
	(0.078)		
Oil Exporting	-0.342**	-12.283***	
	(0.160)	(4.050)	
Commodity		-20.889***	
		(4.998)	
Middle Class Share			0.028*
			(0.014)
Ethnic Fragmentation			-0.001
			(0.002)
Constant	0.081	51.681***	-0.540
	(0.060)	(1.680)	(0.700)
Observations	81	81	81

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location, Oil Exporting Dummy and Ethnic Fractionalization. Endogenous variables are Commodity Producing Dummy, income share of middle class, and democracy index. Standard errors are in parentheses. Significance at 10, 5 percent and 1 percent level is indicated by *, ** and ***, respectively.

In order to investigate this hypothesis further, we conduct 3SLS regressions of the same model with an equation for the voting system (majoritarian), but separately for samples of countries with presidential and with parliamentary systems. As shown in Table 6, when considering the presidential sample, equality in form of the middle class income share has no effect on the probability of a majoritarian system. In contrast, the effect is strong and negative, implying that more inequality implies a higher likelihood of majoritarian systems, in the parliamentary sample. These findings are precisely in line with the theoretical predictions.

Table 4: Inequality and Form of State

Dependent Variable	(1) Commodity	(2) Middle Class Share	(3) Presidential
Explanatory Variables			
Tropical Location	0.339***		
	(0.070)		
Oil Exporting	-0.393	-6.024	
	(0.259)	(5.937)	
Commodity		-29.012***	
		(4.214)	
Middle Class Share			-0.052***
			(0.019)
Observations	59	59	59

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location and Oil Exporting Dummy. Additional exogenous variables in (3) are age of democracy, colonial origin (UK, Spanish, other), and legal origin (UK, French, German, Socialist).

We next consider the implication that presidential systems imply lower levels of redistribution, and are related to higher levels of inequality. A similar reasoning, but conditional on the form of state being parliamentary would be expected for majoritarian voting systems. That presidential systems seem to imply smaller states and less redistribution has been found previously by Persson and Tabellini (2004). Figure 7.3 shows a simple scatter plot of the correlation between middle class income share and central government expenditure, which is a measure of the size of the state.[59] There seems to be no clear pattern, if anything the correlation is positive for high levels of middle class income shares, i.e. low inequality, and negative for low levels of middle class income, i.e. high inequality. When decomposing the picture by form of state and electoral system, as is done in Figure 2, a completely different picture emerges. Inequality is not related to the size of state at all in presidential systems, regardless of the electoral system the scatter is pretty much flat. Moreover, the size of state is lower than that in parliamentary states, where the points are significantly higher. Moreover, presidential countries show much more dispersion in inequality than parliamentary countries. This is most obvious for parliamentary-proportional countries, which are characterized by consistently high levels of central government expenditure and low levels of inequality (a high share of middle class income). A less pronounced picture emerges for parliamentary-majoritarian states, which all exhibit larger levels of taxation and expenditure than presidential states, but more variation in inequality than parliamentary-proportional states. When interpreting these figures, one has to keep in mind that they reflect cross-country patterns, rather than correlations within countries.

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[59]In the appendix, Figure fig:scatter quint ssw displays the correlation between equality and social spending and welfare.

Table 5: Inequality and Form of State

Dependent Variable	(1) Commodity	(2) Middle Class Share	(3) Presidential	(4) Majoritarian
Explanatory Variables				
Tropical Location	0.339***			
	(0.070)			
Oil Exporting	-0.391	-5.928		
	(0.258)	(5.860)		
Commodity		-29.018***		
		(4.214)		
Middle Class Share			-0.052***	0.006
			(0.019)	(0.018)
Observations	59	59	59	59

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location and Oil Exporting Dummy. Additional exogenous variables in (3) and (4) are age of democracy, colonial origin (UK, Spanish, other), and legal origin (UK, French, German, Socialist).

Table 6: Inequality and Form of State

	Presidential System			Parliamentary System		
	(1)	(2)	(3)	(1)	(2)	(3)
Dependent Variable	Commodity	Middle Class Share	Majoritarian	Commodity	Middle Class Share	Majoritarian
Explanatory Variables						
Tropical Location	0.520***			0.208***		
	(0.197)			(0.063)		
Oil Exporting	-0.324	-0.055		-0.216	-5.427	
	(0.464)	(5.640)		(0.218)	(7.053)	
Commodity		-8.705**			-37.104***	
		(3.666)			(11.606)	
Middle Class Share			0.040			-0.058**
			(0.042)			(0.028)
Observations	25	25	25	42	42	42

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location and Oil Exporting Dummy. Additional exogenous variables in (3) are age of democracy, colonial origin (UK, Spanish, other), and legal origin (UK, French, German, Socialist).
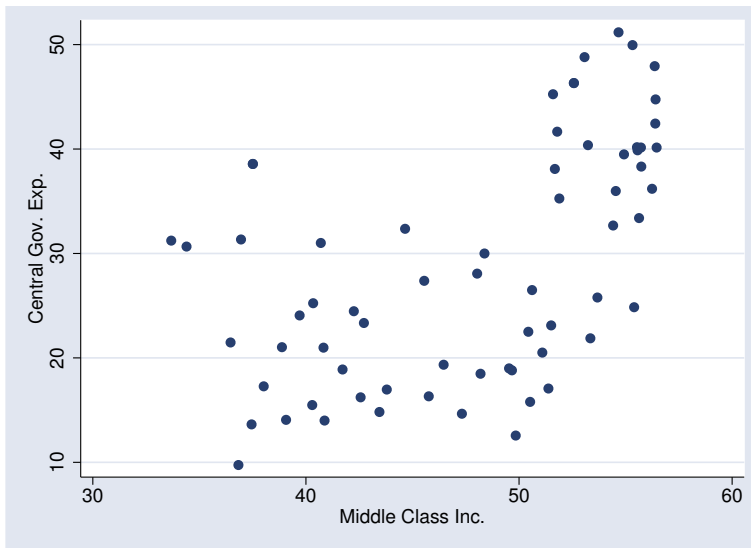
Figure 1: Correlation between Equality and Central Government Expenditure
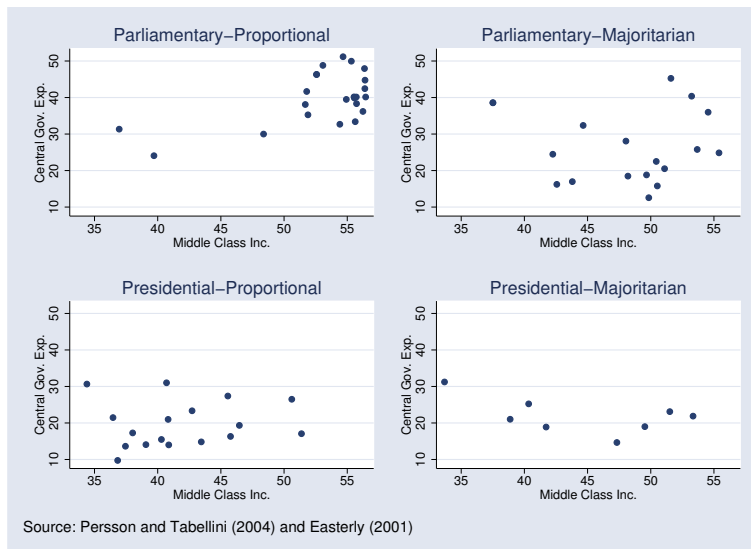

Figure 2: Correlation between Equality and Central Government Expenditure by Form of Constitution

On average, the level of redistribution is larger in proportional than in majoritarian systems, as can be seen from the summary statistics for the size of the public sector, and the extent of spending on social and welfare items displayed in Table 7. When splitting the sample into parliamentary and presidential countries, however, it appears that the electoral system makes a difference for redistribution only in parliamentary systems, but much less so in presidential systems. This is in line with the predictions of the model, since influence activities on the policy implementation under presidential systems cushion redistributive forces. In contrast, under parliamentary systems, the way parliament is composed matters more for the implemented policies. To make these findings more concrete, we follow the approach of Persson and Tabellini (2004) and regress the same system as in Table 4, but adding an equation that accounts for central government expenditure. The specification takes into account that redistribution that is part of central government expenditure, might be affecting inequality. The detailed specification and the results can be seen in Table 8. As before, inequality has an impact on the form of state, but not on electoral systems. In turn, presidential form of state, but not the electoral system, affect central government expenditure significantly negatively. When allowing for presidential entering the equation for electoral systems, as is done in the specification in Table 9, the form of state (parliamentary) affects the likelihood of a majoritarian voting system. Higher inequality also increases this likelihood, even though the latter effect is statistically insignificant. Also in this specification, however, only the form of state, but not the voting system has a significant impact on the fraction of GDP spent by the central government.[60]

Table 7: Inequality, Form of State, Electoral System and Extent of Taxation

| | Majoritarian | | | Proportional | | |
	Mean	Standard Dev.	Observations	Mean	Standard Dev.	Observations
All countries						
Central Gov. Exp.	25.61	8.18	31	30.77	11.3	51
Social Spending Welfare	4.73	5.39	26	10.12	6.59	45
Presidential						
Central Gov. Exp.	23.7	5.84	11	21.45	7.8	22
Social Spending Welfare	3.9	4.15	8	5.29	4.8	17
Parliamentary						
Central Gov. Exp.	26.66	9.19	20	37.83	7.92	29
Social Spending Welfare	5.1	5.92	18	13.06	5.79	28

The reason why presidential systems allow the elite to better restrict redistribution is that the executive can be influenced more easily. The model therefore predicts that corruption of the executive is easier and more widespread under presidential systems than under parliamentary systems. To test this hypothesis, we estimate a similar system as before, but instead of focusing on redistribution we add a proxy for the corruption of the executive as an endogenous variable. The proxy is a composite corruption perception index that reflects the perceptions of experienced business people and country analysts, both resident and non-resident, concerning the degree to which corruption exists among public officials and politicians. The index takes values from 1 to 10 with higher values implying more corruption, and is constructed by Transparency International.[61] The results are reported in Table 10. The main findings are, as before, that higher inequality implies a higher likelihood of presidential systems being adopted. More importantly, however, presidential systems exhibit more corruption as perceived by business

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[60]Similar results are obtained when measuring the size of the state by the average tax revenue from taxes on income, profits and capital gains. Results for social spending and welfare are mixed, with no significant effects of either form of state nor voting system.

[61]The data used are an average of the index in the years 1995-2000 and are available at `http://www.icgg.org/`.

Table 8: Inequality, Form of State, and Extent of Taxation

Dependent Variable	(1) Commodity	(2) Middle Class Share	(3) Majoritarian	(4) Presidential	(5) Central Gov. Exp.
Explanatory Variables					
Tropical Location	0.291***				
	(0.080)				
Oil Exporting	-0.368	-0.799			
	(0.239)	(2.524)			
Commodity		-11.855***			
		(2.483)			
Central Gov. Exp.		0.472***			
		(0.070)			
Middle Class Share			0.009	-0.063***	
			(0.013)	(0.013)	
Presidential					-9.612***
					(3.325)
Majoritarian					-1.639
					(2.462)
Observations	64	64	64	64	64

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location and Oil Exporting Dummy. Additional exogenous variables in (3) and (4) are age of democracy, colonial origin (UK, Spanish, other), and legal origin (UK, French, German, Socialist). Additional exogenous variables in (5) are fraction of population aged 15-64 and fraction aged 65 and older.

Table 9: Inequality, Form of State, Development, and Extent of Taxation

Dependent Variable	(1) Commodity	(2) Middle Class Share	(3) log(GDP90)	(4) Majoritarian	(5) Presidential	(6) Central Gov. Exp.
Explanatory Variables						
Tropical Location	0.275***					
	(0.081)					
Oil Exporting	-0.344	-1.364				
	(0.240)	(2.427)				
Commodity		-13.817***				
		(2.394)				
Central Gov. Exp.		0.442***				
		(0.067)				
Middle Class Share			0.118***	-0.048	-0.061***	
			(0.018)	(0.038)	(0.013)	
Presidential				-0.906*		-8.305**
				(0.530)		(3.822)
Majoritarian						-1.398
						(2.672)
log(GDP90)						2.174
						(2.371)
Observations	63	63	63	63	63	63

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location and Oil Exporting Dummy. Additional exogenous variables in (3) and (4) are age of democracy, colonial origin (UK, Spanish, other), and legal origin (UK, French, German, Socialist). Additional exogenous variables in (5) are fraction of population aged 15-64 and fraction aged 65 and older.

people. Electoral rules, on the other hand, seem to have no impact on corruption.[62] In order to cross-validate these findings, we use an index of government anti-diversion policies as a measure of institutional quality, in particular actions taken against corruption.[63] Higher values of the index, which is defined between 0 and 1, imply better institutional quality, in particular less scope for corruption and discretion on the side of officials. The results in Table 11 are virtually identical to those for the corruption index. In particular, presidential systems have a negative effect on institutional quality, in other words, executives in presidential systems are more corruptible than in parliamentary systems. Electoral rules, however, seem to play no significant role once controlling for the form of state. Again, more unequal societies adopt presidential systems more likely.[64]

Table 10: Inequality, Form of State and Corruption

Dependent Variable	(1) Commodity	(2) Middle Class Share	(3) Presidential	(4) Majoritarian	(5) Corruption P.I.
Explanatory Variables					
Tropical Location	0.370***				
	(0.073)				
Oil Exporting	-0.403	-5.102			
	(0.357)	(8.558)			
Commodity		-29.028***			
		(4.401)			
Middle Class Share			-0.030**	-0.003	
			(0.015)	(0.017)	
Ethnic Fractionalization					0.021*
					(0.011)
Presidential					3.961***
					(0.796)
Majoritarian					-0.215
					(0.968)
Observations	53	53	53	53	53

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location, Oil Exporting Dummy and Ethnic Fractionalization. Additional exogenous variables in (3) and (4) are age of democracy, colonial origin (UK, Spanish, other), and legal origin (UK, French, German, Scandinavian).

To sum up, we find that the crucial assumptions of the theoretical model, as well as the main empirical predictions are not contradicted by the data. Rather, we find support for all theoretical implications.

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[62]Additional unreported results for a specification that includes an equation for the level of development confirm these findings. In particular, corruption seems less pervasive in more developed countries, but the public sphere still appears more corrupt in presidential countries.

[63]This index, which follows Hall and Jones (1999), computes the average of indices on law and order, bureaucratic quality, corruption, risk of expropriation, and government repudiation of contracts.

[64]Additional investigations reveal also in this case that more developed countries seem to have significantly better institutions.

Table 11: Inequality, Form of State, and Anti-Diversion Policies

Dependent Variable	(1) Commodity	(2) Middle Class Share	(3) Presidential	(4) Majoritarian	(5) Gov.Anti-D.Pol.
Explanatory Variables					
Tropical Location	0.362***				
	(0.071)				
Oil Exporting	-0.384	-4.772			
	(0.260)	(5.771)			
Commodity		-26.408***			
		(4.076)			
Middle Class Share			-0.049***	-0.000	
			(0.016)	(0.018)	
Ethnic Fractionalization					-0.002*
					(0.001)
Presidential					-0.362***
					(0.062)
Majoritarian					-0.065
					(0.073)
Observations	58	58	58	58	58

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: Results from 3SLS estimations. Exogenous variables are Tropical Location, Oil Exporting Dummy and Ethnic Fractionalization. Additional exogenous variables in (3) and (4) are age of democracy, colonial origin (UK, Spanish, other), and legal origin (UK, French, German, Scandinavian).

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A   Appendix: Proofs

Lemma 5

Proof. Consider

$$\frac{\partial \pi^E}{\partial (y - y^P)} = -\frac{\partial F^E\left(A^D, k, k^P\right)/\partial(y - y^P)}{\partial F^E\left(A^D, k, k^P\right)/\partial \pi^E} \gtreqless 0, \tag{43}$$

where, again, the denominator is always negative by definition of π^P since it represents the second order necessary condition for a maximum. Rewrite,

$$- \left(y - y^P\right) + \frac{\left(A^D\right)^2 \left[(1-\alpha)(1-\pi) - \pi\right]}{(1-\alpha)\left[A^D(1-\pi)\right]^{\frac{2-\alpha}{1-\alpha}}} < 0$$

and since $y^E \eta = y - (1 - \eta) y^P$ we have,

$$-\frac{1-\eta}{\eta}(y - y^P) - \frac{\left(A^D\right)^2 \left[(1-\alpha)(1-\pi) - \pi\right]}{(1-\alpha)\left[A^D(1-\pi)\right]^{\frac{2-\alpha}{1-\alpha}}}(2-\eta) + \left(y - y^P\right) = 0.$$

which can be rewritten as,

$$F^E\left(\pi, k, k^E, A^D\right) = \left(1 - \frac{1}{\eta}\right)(y - y^P)(1 - \eta) - (2 - \eta)\frac{\left(A^D\right)^2 \left[(1-\alpha)(1-\pi) - \pi\right]}{(1-\alpha)\left[A^D(1-\pi)\right]^{\frac{2-\alpha}{1-\alpha}}} = 0$$

and finally

$$\frac{\partial \pi^E}{\partial (y - y^P)} < 0 \iff \left(1 - \frac{1}{\eta}\right)(1 - \eta) < 0, \tag{44}$$

□

Lemma 10

Proof. Taxation is distortionary the total income produced in the economy is ranked accordingly being largest if the elite chooses the implemented policy. In particular for any given target set by the parliament τ^{Pr} we have,

$$y(\pi\tau^{Pr} + (1-\pi)\tau^E) > y(\pi\tau^{Pr} + (1-\pi)\tau^M) > y(\pi\tau^{Pr} + (1-\pi)\tau^P) \quad \forall \tau^{Pr} \tag{45}$$

Denote by τ_j^* the equilibrium tax rate what would emerge if group j where to win the lobbying game, and $\Delta y^i(j)$ the differential benefits accruing to winning group i with respect to the case in which the winner is group j. Consider,

$$\begin{aligned}
\Delta y^E(P) &= \eta\left[(1 - \tau_E^*)y^E + \tau_E y(\tau_E^*) - (1 - \tau_P^*)y^E - \tau_P^* y(\tau_P^*)\right] \tag{46}\\
\Delta y^P(E) &= (1 - \eta - \mu)\left[(1 - \tau_P^*)y^P + \tau_P^* y(\tau_P^*) - (1 - \tau_E^*)y - \tau_E^* y(\tau_E^*)\right]
\end{aligned}$$

The elite wins the lobbying game if $\Delta y^E(P) > \Delta y^P(E)$ and $\Delta y^E(M) > \Delta y^M(E)$ for any π and τ^{Pr}. The first inequality is true if, rearranging,

$$\begin{aligned}
\eta(\tau_P^* - \tau_E^*)y^E &> (1 - \eta - \mu)(\tau_E^* - \tau_P^*)y^P + (1-\mu)(\tau_P^* y(\tau_P^*) - \tau_E^* y(\tau_E^*)) \tag{47}\\
&\Rightarrow (\tau_P^* - \tau_E^*)[\eta y^E + (1 - \eta - \mu)y^P] > (1-\mu)(\tau_P^* y(\tau_P^*) - \tau_E^* y(\tau_E^*))\\
&\Rightarrow (\tau_P^* - \tau_E^*)\frac{\eta y^E + (1 - \eta - \mu)y^P}{(1-\mu)} > \tau_P^* y(\tau_P^*) - \tau_E^* y(\tau_E^*)
\end{aligned}$$

Note that since $y(\tau_E^*) > y(\tau_P^*)$ then condition (47) is true, a fortiori, if the following condition is true,

$$(\tau_P^* - \tau_E^*)\frac{\eta y^E + (1 - \eta - \mu)y^P}{(1 - \mu)} \quad > \quad \tau_P^* y(\tau_E^*) - \tau_E^* y(\tau_E^*) \tag{48}$$

$$\Rightarrow \quad \frac{\eta y^E + (1 - \eta - \mu)y^P}{(1 - \mu)} > y(\tau_E^*)$$

note that since $\tau_E^* > 0$ then $y(0) > y(\tau_E^*)$ so a necessary condition for (47) to be true is the following

$$\Rightarrow \quad \frac{\eta y^E + (1 - \eta - \mu)y^P}{(1 - \mu)} > y(0) \tag{49}$$

$$\Rightarrow \quad \frac{\eta y^E + (1 - \eta - \mu)y^P}{(1 - \mu)} > \eta y^E + \mu y^M + (1 - \eta - \mu)y^P$$

$$\Rightarrow \quad \eta y^E + (1 - \eta - \mu)y^P > (1 - \mu)\eta y^E + (1 - \mu)\mu y^M + (1 - \mu)(1 - \eta - \mu)y^P$$

$$\Rightarrow \quad \eta y^E + \mu y^M + (1 - \eta - \mu)y^P = y(0) > y^M$$

therefore, since $y(0) > y^M$, we have shown that $\Delta y^E(P) > \Delta y^P(E) \; \forall \tau^{Pr}$. The proof to show that $\Delta y^E(M) > \Delta y^M(E) \; \forall \tau^{Pr}$ is analogous. In order to identify the contribution made by the elite we need to identify the differential benefits received by the other groups when being assigned the right to set the policy with respect to the case in which this right is given the elite that is $\Delta y^M(E)$ and $\Delta y^P(E)$ which are strictly smaller than $\Delta y^E(M)$. To win the lobbying game the elite has to offer at least the maximum between the benefits of the other groups. $\square$

B   Appendix: Data

The data taken from Persson and Tabellini (2003, 2004) is confined to democracies of different quality of democratic institutions, but contains no non-democracies. Within this data set, only variation in the quality of democratic institutions is available. Other information concerning political institutions apart from the indicators for the form of government and the voting system, includes a dummy for federal state structures ($federal$), dummies for the period to which the constitutional design dates back, 1920-1950 ($con2050$), 1951-1980 ($con5180$), and after 1981 ($con81$, the age of a democracy, as defined by the fraction of the last 200 years of uninterrupted democracy, age, and dummies for the origins of the legal system in place ($legor$). Moreover, historical influences are controlled for by adding dummies for colonial history (col_uk, col_espa, col_otha). The quality of democratic institutions, i.e. the extent of democratization, is measured using the so-called $polityIV$-index, which assigns to each country an integer score ranging from -10 to 10 with higher values being associated with better democratic structures. Alternatively, and as robustness test, we use the so-called $gastil$-indices of political rights and civil liberties, which range from 1 to 7 with lower values associated with better democratic institutions.

Other economic variables used in the empirical analysis include log per capita income, denoted lyp, the sum of exports and imports as share of GDP ($trade$), log total factor productivity ($loga$), an index of openness to trade measuring the fraction of years during 1954-1990 during which a country was open to trade ($yrsopen$), and an indicator variable concerning the level of development of a country ($oecd$). Demographic information includes the log of population size ($lpop$), age structure of the population (the shares of population in working age and retirement age, $prop1564$ and $prop65$, respectively), and ethno-linguistic fragmentation ($avelf$).

To control for unobservable influences and as instruments, we also use information on latitude as measured by absolute distance from equator $latitude$ and $distequa$, and introduce dummies

for continental location (Africa *africa*, Eastern and Southern Asia *asia*, and Southern and Central America including the Caribbean *laam*).

Easterly (2001) categorizes countries by major export dummies. Major export categories are those that account for 50 percent or more of total exports of goods and services from one category, in the period 1988-92. The categories are: non-fuel primary products (*commodity*), fuels (*oil*), manufactures, and services (factor and non-factor service receipts plus workers' remittances). If no single category accounts for 50 percent or more of total exports, the economy is classified as diversified.
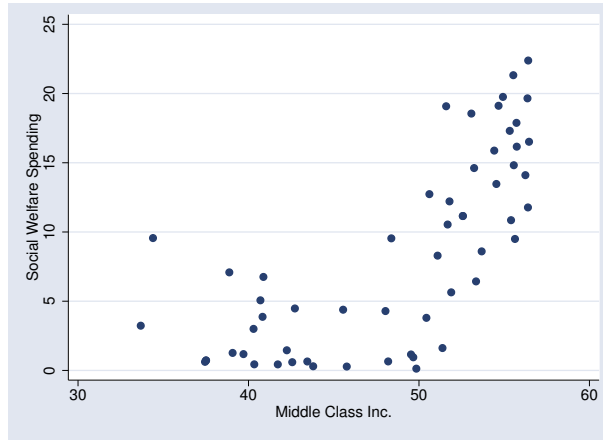
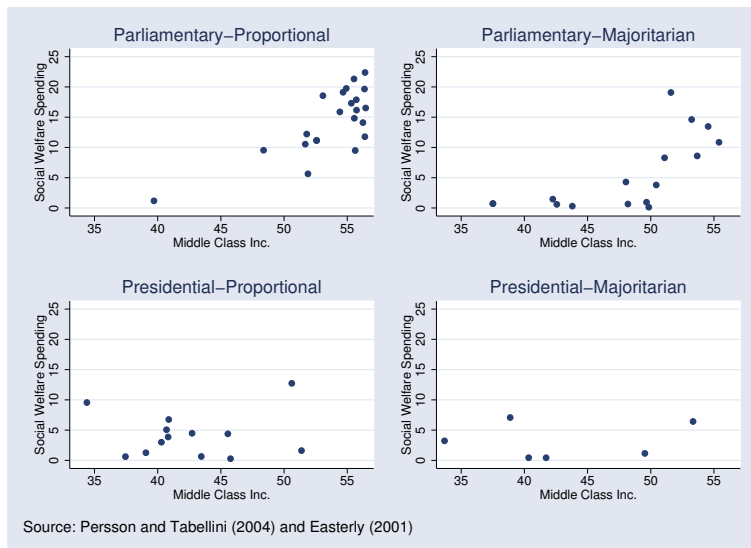Figure 3: Correlation between Equality and Social Spending and Welfare

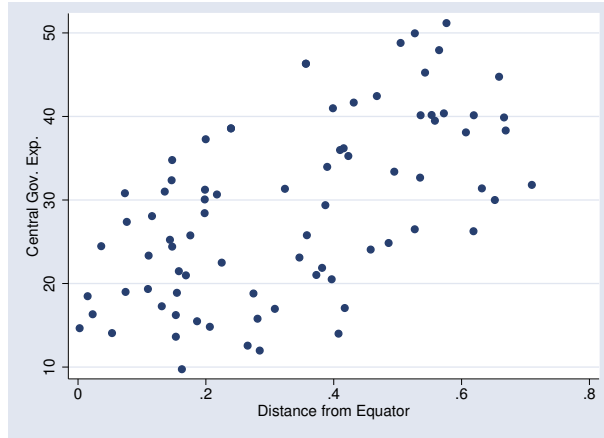Figure 4: Correlation between Equality and Social Spending and Welfare

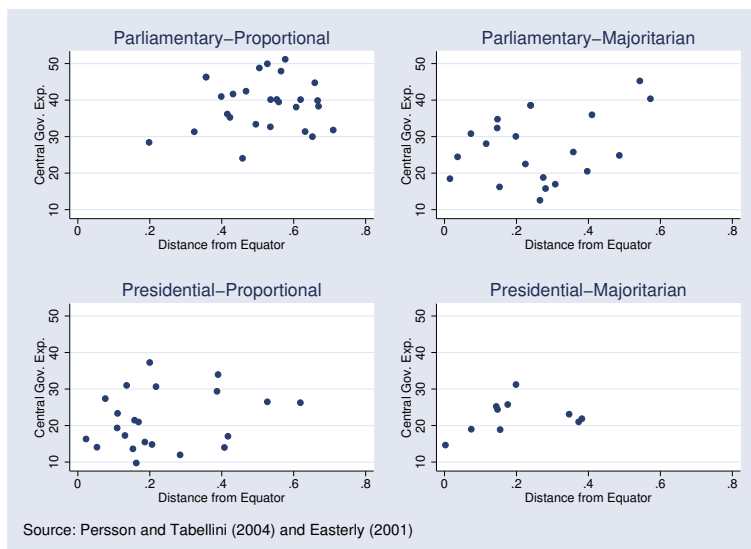Figure 5: Correlation between Distance from Equator and Central Government Expenditure

Figure 6: Correlation between Distance from Equator and Central Government Expenditure