

Populist Policies in the Transition to Democracy*

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Abstract

This paper develops a political economy model that provides an explanation as for why ruling elites in oligarchic societies may rely on income redistribution to the poor (the masses) in order to prevent them from attempting a revolution. We refer to this kind of redistribution as populist redistribution because, first it does not increase the poor's productive capacity (human capital), and second it seeks to "buy" political support (peace) to perpetuate the elite's control of political power. We examine the conditions under which ruling elites choose to deter the poor (by means of military repression and/or populist redistribution), to engage in a dispute with the poor for the control of political power, or, alternatively, to extend democracy. According to the results of the model populist redistribution (or military repression), if any, increases with initial wealth inequality and with the amount of redistribution that the poor can undertake under democracy, and decreases with the relative importance of a human capital externality in production. The model explains why in some cases the use of an apparently inefficient policy of populist redistribution turns out to be optimal for both groups (the ruling elite and the poor class) when the alternative is the use of military repression or default to conflict.

Keywords: Populism, Oligarchy, Democracy, Conflict, Inequality.

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“...there was no place on them (the large states) for the smallholder, who now had to make his way to the city and fend for himself as well as he could, a Roman citizen in name, but a proletarian in the making. Yet as a citizen he still had a vote. To those with wealth and political ambition he became someone to buy or to intimidate.”

J.M. Roberts (2004), p. 239.

1. Introduction

Throughout history oligarchic regimes' elites have relied on different methods to try to perpetuate their control of political power. While in some cases ruling elites have used only military repression to deter any threat of revolution, in some other cases they have relied on income transfers to the poor (the “masses”, the “people”) in order to dissuade them from attempting a regime change. However, ruling elites have not always been able to completely deter the poor classes from forcing such a regime change, and have had to engage in a dispute with them, sometimes violent, for the control of political power. Yet, in some other cases, ruling elites have decided in their own best interest to politically empower the poor and allow for a peaceful transition to democracy. This paper develops a model that captures these different historical scenarios, explains the choices made by oligarchic regimes, and provides a framework for understanding the prolongation (through military repression and/or populist redistribution) of oligarchic regimes, or their eventual fall.

One of the main objectives of this paper is to explain the conditions under which a ruling elite chooses to engage in populist redistribution as opposed to military repression in order to deter the masses from attempting a revolution that seeks to change the political regime. The model also sheds light on the conditions for a peaceful and non-peaceful transition to democracy. We derive the optimal expenditure done by the elite under each one of these possible cases (oligarchy with populism and military repression, transition to democracy, and democracy). *A priori*, however, it is not clear under what conditions would an oligarchic regime use military repression, populist redistribution, or a combination of both in order to maintain political control. Thus, the proposed model explains these different means used by oligarchic elites to maintain political control based on the elite's incentive to engage in repression and populist redistribution, *vis-à-vis* the poor class' incentive to allocate resources to challenge the elite's political control. These incentives, in turn, depend on the “fundamentals” of the economy: a measure of wealth inequality, the technology parameters of conflict and production, the level of wealth redistribution that the poor can undertake if the political regime were to be a democracy, and the relative importance of a human capital externality in production.

In addition to this introduction, the paper contains five sections. Section 2 clarifies some concepts that will be used throughout the paper such as oligarchy, democracy, and populism; Section 3 contains a short review of the related literature and highlights the contributions of this paper. Section 4 explains the basic setup of the model, its components, and the description of the equilibrium. In section 5 we study the main results of the model and present the comparative statics results. Section 6 concludes.

2. Basic Concepts

The classification of political regimes into two major groups, oligarchy and democracy is useful for the interpretation of the history of political development. In the remainder of the paper we will use this broad characterization of political regimes and we will distinguish between oligarchic and democratic regimes based on a real factor, namely, whether the political (and economic) decisions are controlled by a small minority, the elite, or whether they are determined by the majority group in the population. Nevertheless, the existence of an elite is not a sufficient condition for a regime to be oligarchic, especially in those societies that are governed under formally democratic institutions. In other words, a democratic society is characterized by how diluted across the population the political power is, and not by the lack of an elite. In fact, democracy was interpreted by Schumpeter ([1942] 1954a) as the competition in the political arena between different elites for the support of a wide mass of voters.¹

One of the most interesting aspects of the analysis of political regimes is their dynamics. A good portion of political history (at least that of Europe, post-colonial Latin America, and 20th century Asia and Africa) could be related to the tensions between pro-oligarchic and pro-democratic forces, with the predominance of the latter in the long run.² These tensions, however, have not always resulted in violent struggles.

This paper takes a step forward by providing an explanation of populism. This has been a recurrent phenomenon in Latin America's recent political history, and, more importantly, a crucial component of the explanation as for why some oligarchic regimes have managed to remain in power during the 20th century in this region.³

¹According to McCormick (2001), Machiavelli (in *Discourses*) was the first author to conceive democracy as a competition between elites for the popular vote (but, also, as a system of additional political controls imposed on the elites by the wide mass of voters).

²According to Schumpeter's interpretation of Plato's Political Theory (Schumpeter, 1954 a), he considered the process of economic development (the growth of population, commerce, and wealth) to be "rebellious", in the sense of being incompatible with the perpetuation of the ideal (and oligarchic) Republic. A modern expression of this idea can be found in Roxborough (1984, p. 24).

³The substantive approach to Latin American populism (fiscal and monetary expansionary policies

Defining populism has proven to be a difficult task.⁴ The definition of populism that we will use follows the substantive approach (the one favored by economists): the attempt to gain political support using paternalistic policies, in the form of income redistribution, that do not increase the workers' productive capacity nor their level of education. In other words, populist policies can be seen as the price that ruling elites would have to pay to buy support and political peace, at least temporarily. As noted in the introduction, we see populism as an alternative that elites have in order to perpetuate their control of political power, the other alternative being military repression. If the substantive approach is to be taken seriously, then economic inequality constitutes a necessary, although not always sufficient, condition for the existence of populism.⁵

3. Related Literature and Main Contributions

There are two relatively well identified views in the economic literature on the reasons that brought about the transition to democracy. While the first one stresses the threat of a revolution by the masses as the driving force behind political reforms and the extension of the franchise, the second one interprets the transition to democracy as an outcome of a cooperative process where the economic interests of the elite are not necessarily an obstacle to the extension of the franchise. In fact, in some of the papers in the literature that follow the second view, political reforms are promoted by the ruling elite as an optimal response to changing economic conditions such as rapid urbanization and the increasing importance of human capital in production during the process of development. As noted by Lizzeri and Persico (2004) the two views may be complementary to each other and the forces highlighted by the second view may well coexist with the threat of a revolution. The key difference between the two views is that the second one does not rely on the threat of a revolution to explain the transition to democracy.

According to the first view, elites, faced with the threat of a revolution, were forced to extend the franchise because any promise of future income redistribution would not have been credible. In other words, the extension of the franchise was the (credible) commit-

beyond limits, as well as wage and price controls, etc., whose main purpose is to redistribute income) was the focus of Dornbusch and Edwards (1991, ch. 1). See also Kauffman and Stallings (1991), who identify the following political goals of populism: “ (1) mobilizing support within organized labor and lower-middle-class groups; (2) obtaining complementary backing from domestically oriented business; and (3) politically isolating the rural oligarchy, foreign enterprises, and large-scale industrial elites.”

⁴See Di Tella (1965), Roxborough (1984), Dix (1985), Knight (1998), Roberts (2000, p. 14), among others.

⁵In fact, “clientelism” has aroused in some countries as a substitute (see the analysis in Robinson and Verdier, 2003, and Urrutia, 1991).

ment device of future income redistribution used by the elites to prevent social unrest (see Acemoglu and Robinson, 2000, 2006). A related explanation is offered by Bourguignon and Verdier (2000), where the transition from an oligarchic to a democratic regime takes place because the elite may decide to increase educational expenditure in favor of the poor in order to avoid the risk of a violent revolution and the property expropriation that comes with it, and, at the same time, stimulate economic growth *via* higher rates of human capital accumulation.^{6,7}

In the second view the transition to democracy arises as a peaceful process promoted by the ruling elite. For instance, in Galor and Moav (2006) the elite may decide, in its own interest, to increase the tax rate that they themselves have to pay in order to finance public expenditure in education (in favor of the poor) to prevent the return on capital from declining. Their argument relies on the complementarities between physical and human capital accumulation in the process of economic development. The increase in human capital not only favors the workers and the capitalists, but also creates an engine for sustained economic growth. A complementary explanation for a peaceful extension of the franchise was proposed by Lizzeri and Persico (2004) in a model based on divisions within the ruling elite. While some groups within the ruling elite support the provision of public goods, others favor patronage politics (clientelism), and it is the extension of democracy what resolves this tension. More precisely, exogenous increases in the value of public goods provision (i.e. increases in the opportunity cost of redistributive policies), coming, from instance, from rapid urbanization tilt the balance within the ruling elite away from special interest politics and towards the increased provision of public goods. Finally, Gradstein (2007) examines the elite's incentives to extend democracy in a model that is based on the premise that democracy is an institution conducive to the protection of property rights. While the elite benefits from the protection of property rights that comes with democratization because it fosters investment and economic growth, the extension of democracy implies a redistribution of resources from the elite and toward the poor. The extension of the franchise in Gradstein's model is less likely to occur in more unequal societies because it is in these societies where the redistributive losses suffered by the small elite outweigh the growth enhancing benefits that come with democratization.⁸

⁶However, Bourguignon and Verdier (2000) are aware of the possibility that, for the elite, the present value of the benefits (in terms of the portion of higher income that they are able to capture) of extending democracy may turn out to be lower than the cost of redistribution that comes with democracy.

⁷Although Grossman and Kim (2003) is not directly interested in explaining the transition to democracy it does offer an explanation along the same lines in the sense that educational reforms promoted by the elite may prevent social unrest.

⁸The negative relationship between initial inequality and the likelihood of democratization is supported

The contribution of this paper is twofold. First, it encompasses the two views described above about the extension of the franchise. More precisely, the extension of the franchise in the model may come either from the élites own interest or from a revolution by the masses. Second, the model provides a rationale for the possible perpetuation of oligarchic regimes. In other words, the model delivers equilibria under which the elite optimally decides not to extend the franchise and uses either military repression or income redistribution to the poor to deter any revolutionary attempt. Whether there is a peaceful or non-peaceful transition to democracy, or whether the elite decides to deter the masses and keep the control of political power using income redistribution or military deterrence depends on the fundamental characteristics of the economy, namely, the degree of wealth inequality, the extent of redistribution under democracy, the relative importance of a human capital externality in production, and the relative efficiency of the poor in challenging the elite over the control of political power.

Whether the first view is better suited than the second one to explain the transition to democracy depends on the characteristics (“fundamentals”) of each particular country. By anchoring four of these “fundamentals” that were described in the previous paragraph this paper provides a framework for interpreting why some countries had a peaceful transition to democracy promoted by the elite, others transitioned to democracy under the threat of (or an actual) revolution, and other countries remained oligarchic for a long period of time.

The paper is also related to the economic literature that has tried to model the causes of populism. Campante and Ferreira (2006) develop a model of political competition between different interest groups for the allocation of public funds. In their model, the groups’ relative lobbying effectiveness determines whether the equilibrium is populist (inefficiently pro-poor) or oligarchic (inefficiently pro-rich). While in their model populism is a result of a political process based on lobbying, in this paper we see populism as the price of political support that a ruling elite pays in order to remain in power.

4. The Model

4.1. The Basic Structure

Assume there is a continuum of individuals of size one. The population is divided into two groups: a ruling elite, which is a group of size $1 - p$, and the poor (the “masses”), which is a group of size p (with $p > 1/2$). It is assumed that the elite initially holds the control of political power. One of the choices that the elite can make is whether to extend political

by the evidence in Engerman and Sokoloff (2001).

power to the poor class or not. If it does, we will call the political system a democracy. Otherwise, that is, if the elite remains in power, we will refer to it as an oligarchic regime.

4.1.1. Endowments⁹

Each individual in the economy has a non-negative endowment of wealth. Wealth cannot be directly consumed, but rather it is used to finance the accumulation of human capital, which is the only (individual) input of the consumption good's production technology. For the sake of simplicity, we assume that there is no alternative use of wealth.

Given that the total population is assumed to have size one, the total and the average endowments in the population are equal.

Endowments in the Oligarchic Regime On the one hand, let $e_e^o > 0$ and $e_l^o > 0$ be the endowments of each agent of the ruling elite and the poor class respectively, when the political regime is oligarchic (when the elite is in power). We will assume that $e_e^o > e_l^o$. In words, the members of the ruling elite have a higher wealth endowment than the members of the poor class. The mean endowment in the whole population when the regime is oligarchic, \bar{e}^o , is then equal to $(1 - p)e_e^o + pe_l^o$. Let $d^o = e_e^o - e_l^o$, be a measure of inequality in the distribution of endowments when the regime is oligarchic. Using the last expression, we can express the endowment of each individual of the ruling elite in this political regime as: $e_e^o = \bar{e}^o + pd^o$, and the endowment of each member of the poor class as: $e_l^o = \bar{e}^o - (1 - p)d^o$.

Endowments in the Democratic Regime We will assume that in a democratic regime the majority of the population (the poor class) decides on the amount of wealth redistribution, if any, from the members of the elite to the members of the poor class.¹⁰ Let $e_e^d > 0$ and $e_l^d > 0$ be the endowments of each agent of the ruling elite and the poor class, respectively, under a democratic regime. That is, e_e^d and e_l^d are the endowments of each individual in each one of the groups after the redistribution of endowments that comes with democracy takes place.

For our purposes, we don't need to assume anything regarding which group's endowment turns out to be larger after the redistribution takes place (that is, whether $e_e^d \leq e_l^d$). However, we will assume that $e_e^d < e_e^o$ and $e_l^d > e_l^o$ (the endowment of the elite in a democratic regime is smaller than in the oligarchic regime, and the opposite is true for the poor class). Our corresponding measure of inequality under the democratic regime

⁹The setup in this subsection closely follows Bourguignon and Verdier (2000).

¹⁰The extension of the franchise is likely to induce higher taxation and redistribution as the position of the decisive voter changes (see Meltzer and Richard, 1981).

is: $d^d = e_e^d - e_l^d$. Given the assumption that the endowment of each agent of the poor class is larger under democracy and the endowment of the ruling elite is lower, inequality under democracy is lower than inequality under oligarchy as long as: $\theta = |d^d|/d^o < 1$.¹¹ The parameter θ captures the relative level of inequality between the democratic and the oligarchic regime. The lower is θ , the larger the reduction in inequality in the democratic regime is, relative to the inequality that prevailed in the oligarchic regime. Furthermore, the mean endowment in the population under democracy, \bar{e}^d , is equal to $(1-p)e_e^d + pe_l^d$.

Note that we can now express the endowment of each individual of the ruling elite under democracy as: $e_e^d = \bar{e}^d + pd^d = \bar{e}^d + p\theta d^o$, and the endowment of each member of the poor class in the democratic regime as: $e_l^d = \bar{e}^d - (1-p)d^d = \bar{e}^d - (1-p)\theta d^o$.

We will assume that the redistribution of endowments that takes place in a democratic regime does not induce any endowment losses, and as a result the mean endowment in the population under democracy is equal to the mean endowment when the elite is in power ($\bar{e}^o = \bar{e}^d = \bar{e}$).¹²

4.1.2. Human Capital Formation Technology

As mentioned earlier, agents can only use their wealth endowment to accumulate human capital, which is itself the only individual factor of production of the consumption good. Let $h(e) = (1+e)^\gamma$, with $0 < \gamma < 1$, be the amount of human capital that an agent with an endowment e can accumulate.

Using the endowment levels derived in the previous section, we can deduce the amounts of human capital acquired by the two types of individuals in each one of the two political regimes. On the one hand, when the elite is in power the average level of human capital in the economy is given by:

$$\bar{h}^o = (1-p)h(e_e^o) + ph(e_l^o) = (1-p)(1+\bar{e} + pd^o)^\gamma + p(1+\bar{e} - (1-p)d^o)^\gamma, \quad (1)$$

where the first term is the proportion of the population in the elite times the human capital of each member of the elite, and the second term is the proportion of poor individuals in the population times their human capital.

On the other hand, in a democratic regime the average human capital in the economy is given by:

¹¹Presumably, however, it is most likely that the elite's endowment after redistribution is still larger than that of the poor class ($e_e^d > e_l^d$), and, as a result $d^d > 0$.

¹²This assumption is made only for analytical simplicity. However, the setup of the model can easily be extended to allow for endowment losses of redistribution.

$$\bar{h}^d = (1-p)h(e_e^d) + ph(e_l^d) = (1-p)(1 + \bar{e} + p\theta d^o)^\gamma + p(1 + \bar{e} - (1-p)\theta d^o)^\gamma. \quad (2)$$

Note that with $0 < \gamma < 1$, $\bar{h}^d > \bar{h}^o$.¹³

4.1.3. Income

We will assume that each individual's income is determined by her own level of human capital. Also, we will assume the existence of a Lucas-type externality, where individual i 's human capital is more productive the higher the average human capital in the population is.¹⁴ More precisely, let individual i 's income be:

$$y(e_i^j, \bar{h}^j) = h(e_i^j)^\alpha \left(\bar{h}^j\right)^\eta, \text{ with } 0 < \alpha, \eta < 1, \text{ and } \alpha + \eta \leq 1, \text{ for } i = e, l \text{ and } j = o, d, \quad (3)$$

where α measures the elasticity of income to individual's human capital, and η captures the size of the human capital externality in production.

Using equation 3, the income of each individual of the elite in an oligarchic regime is given by:

$$y_e^o = (1 + \bar{e} + pd^o)^{\alpha\gamma} \left(\bar{h}^o\right)^\eta, \quad (4)$$

and under a democratic regime, income of each individual of the elite is given by:

$$y_e^d = (1 + \bar{e} + p\theta d^o)^{\alpha\gamma} \left(\bar{h}^d\right)^\eta. \quad (5)$$

Given that $\theta < 1$, the human capital of the elite individuals is lower under the democratic than under the oligarchic regime. However, average human capital in the economy is larger under democracy than in an oligarchic regime (that is, $\bar{h}^d > \bar{h}^o$). As a result, if the human capital externality is sufficiently large, and/or the amount of redistribution that can take place under democracy is sufficiently small (θ sufficiently large), the elite individuals' income may be higher under democracy than under oligarchy. In other words, depending on θ (which measures how much redistribution can be decided by the poor if the elite extends political power), γ (which measures the concavity of the human capital formation

¹³This follows directly from the assumption that $\gamma < 1$ and from Jensen's inequality. Note that if we were to allow for an endowment loss of redistribution, $\bar{h}^d > \bar{h}^e$ would only be the case for a sufficiently small γ , and/or a sufficiently low endowment loss from redistribution.

¹⁴See Lucas (1988).

technology), and η (the size of the human capital externality), the income of each individual member of the elite may be larger under democracy than under oligarchy.

Income for each individual of the poor class in the oligarchic regime is given by:

$$y_l^o = (1 + \bar{e} - (1 - p)d^o)^{\alpha\gamma} \left(\bar{h}^o\right)^\eta, \quad (6)$$

and, under a democratic regime is given by:

$$y_l^d = (1 + \bar{e} - (1 - p)\theta d^o)^{\alpha\gamma} \left(\bar{h}^d\right)^\eta. \quad (7)$$

Given that $\theta < 1$, and $\bar{h}^d > \bar{h}^o$, then $y_l^d > y_l^e$. In words, poor individuals' income is unambiguously larger under democracy than under oligarchy.¹⁵

Having determined the main components behind income for each group under each one of the political regimes we now turn to studying the dispute of political power.

4.2. The Dispute of Political Power

Given the assumption that the elite initially holds the control of political power, at the beginning of the game the elite chooses whether to extend democracy or not. On the one hand, if the elite extends the franchise, no resources are allocated by any of the two groups to the dispute of political power and no populist redistribution takes place. We assume that the political regime remains democratic thereafter.¹⁶ On the other hand, if the elite decides not to extend democracy, it makes two choices. First, it chooses the amount of resources to allocate to the dispute with the poor class over the control of political power. Second, the elite can setup a system of income transfers to the poor class that only takes place conditionally on the elite remaining in power. That is, we assume that the elite can commit to redistributing income to the poor class if it were to remain in power.¹⁷ By

¹⁵Note that if we allow for endowment losses of redistribution it may be the case that the poor class' income is lower under democracy.

¹⁶In other words, we are implicitly assuming that once the franchise is extended, it is prohibitively costly for one of the groups to exclude the other from the political decision process (Acemoglu and Robinson, 2000).

¹⁷A more complete version of the model, in terms of the system of income transfers being reversible once the elite remains in power, would yield exactly the same results. That version of the model assumes that if the elite does not make the income transfer (once it remains in power), it would face the threat of a "counter-attack" by the poor class. Then, in this second stage of the game the elite would face the decision of whether to fulfill the promise by doing the transfer, or to engage in yet another dispute with the poor. Given that conflict is a costly choice, from this second stage an incentive compatibility constraint arises with regard to the maximum level of income transfer that the elite would fulfill. This version of the model is perhaps too long for an appendix. Nevertheless, it is available from the authors upon request.

setting up a system of (irreversible) income transfers, the elite increases the income the poor class would receive if the elite were to keep the control of political power and, as a result, it reduces the incentive of the poor class to dispute the elite's control of political power. We will refer to this kind of redistribution as "populist" expenditure, in the sense that this type of transfer does not increase the poor class' productive capacity (their human capital in the model), but only decreases the incentive that the poor have to challenge the elite's control of political power by increasing the income that the latter group receives in the oligarchic regime. In other words, by engaging in populist expenditure the elite is, in some sense, "buying protection" from the poor class. In contrast, in a democratic regime it is a wealth transfer (not an income transfer) that takes place (which is decided by the majority of the population - the poor), and, as a result, poor individuals accumulate more human capital and receive a higher income due to their higher productive capacity.¹⁸ The assumption that we make regarding the (one time) wealth transfer that comes with democracy is consistent with a model where, instead of a wealth transfer from the rich to the poor that is used by the latter to accumulate human capital, the rich commit to financing public schooling in every period. In other words, given that wealth, which is by assumption converted into human capital in our model, generates streams of income in every period, a one time wealth transfer is consistent with an income transfer from the rich to the poor targeted to the financing of public schooling in every future period.

It will be assumed that the elite enjoys a first-mover-advantage in the dispute of political power.¹⁹ That is, when deciding the allocation of resources to the dispute of political power and to populist redistribution, the elite takes into account how these two choices affect the poor class' allocation of resources to the dispute of political power. This assumption implies that under certain circumstances the elite may choose a combination of resources (to defend its control of political power and a level of populist redistribution) such that the poor class, optimally, decides not to allocate any resources to disputing the elite's control of political power.²⁰ If this is the case, there is complete deterrence, but, *a priori* we don't know

¹⁸Note that even if populist expenditure were directed towards providing education for the poor, the assumption that poor individuals accumulate more human capital under democracy than under oligarchy would still be valid. This is because at least some of the training and education provided by an oligarchic regime may be political and ideological in nature and may not lead to higher productivity for the poor. We thank one of the referees for pointing this out.

¹⁹In other words, we assume that the elite's expenditure in defense and the setup of a system of income transfers to the poor represent a commitment on the incumbent's part: the elite (more formally, the *Stackelberg leader* in the dispute of political power). For a similar treatment of the leader-follower nature of the contestants in conflict situations see Grossman and Kim (1995, 1996a,b) and Gershenson (2002).

²⁰This is a standard feature of leader-follower games in the political economy of conflict literature. For a more detailed explanation of this feature of leader-follower conflict games see Gershenson (2002).

whether the strategy used by the elite to induce this outcome is based purely on resources allocated to the dispute of political power (with no populist expenditure), if it is based only on a high enough level of populist expenditure (with no resources allocated by the elite to the dispute of political power), or, if the deterrence outcome results from a combination of positive levels of resources allocated by the elite to defending its control of political power and to populist expenditure.

However, under other circumstances it may not be optimal for the elite to completely deter the poor class from challenging its control of political power. In this case, both the poor class and the ruling elite will allocate resources to conflict, and the elite may also, in principle, choose to engage in populist redistribution to diminish the incentive of the poor class to challenge its control of political power.

We will assume that in the dispute over the control of political power the elite is successful in keeping power with probability q . This probability is determined, on average, by the following contest success function:²¹

$$q = \frac{g_e}{g_e + \phi g_l}, \quad (8)$$

where g_e and g_l denote the resources that the ruling elite and the poor classes, respectively, allocate to the dispute of political power.²²

The positive parameter ϕ in equation 8 measures the relative efficiency of resources that the poor class allocates to this dispute. According to equation 8, if both g_e and g_l are positive, then the probability of the elite remaining in power is positive but less than one, and it is an increasing concave function of the ratio $g_e/\phi g_l$.

Figure 1 presents the game tree. The first expression in each terminal node is the elite's payoff and the second one denotes the poor class' payoff.

[INSERT FIGURE 1 HERE]

4.3. Consumption and Optimizing Conditions

As noted earlier, we are assuming that the ruling elite moves first, and then, after observing the elite's choices, the poor class' individuals decide on the allocation of resources, if any,

²¹A contest success function (CSF) is "a technology whereby some or all contenders for resources incur costs in an attempt to weaken or disable competitors" (Hirshleifer, 1991). In this particular case, the CSF determines the probability of controlling political power for each player (the elite and the masses) as a function of the expenses incurred by each of the two players. See Skaperdas (1996) and Hirshleifer (2001) for a detailed explanation of different functional forms of CSFs.

²²We do not necessarily need to think of the dispute of political power as a violent struggle. For instance, the dispute between the two groups can take the form of lobbying (see Campante and Ferreira, 2006).

to dispute the elite's control of political power. We start by solving the problem faced by the poor class' individuals.

4.3.1. The poor class

The poor class individuals' expected consumption is given by:

$$c_l = q(y_l^o + g) + (1 - q)y_l^d - g_l, \quad (9)$$

where $g \geq 0$ is the amount of populist redistribution that the elite will make, if any, conditional on remaining in power.

The poor class chooses g_l in order to maximize c_l , taking g and g_e as given. The first order condition of the poor class' optimization problem is:

$$\frac{\partial c_l}{\partial g_l} = \begin{cases} \frac{\partial q}{\partial g_l}(y_l^o + g - y_l^d) - 1 \leq 0 & \text{and } g_l = 0 \\ \text{or,} \\ \frac{\partial q}{\partial g_l}(y_l^o + g - y_l^d) - 1 = 0 & \text{and } g_l > 0 \end{cases} \quad (10)$$

Using equation 8 to calculate $\frac{\partial q}{\partial g_l}$, the poor class' choice of g_l can be summarized by the following expression:

$$g_l = \begin{cases} \sqrt{\frac{g_e}{\phi}(y_l^d - y_l^o - g)} - \frac{g_e}{\phi} & \text{for } 0 < g_e + \phi g < \phi(y_l^d - y_l^o) \\ 0 & \text{for } g_e + \phi g \geq \phi(y_l^d - y_l^o) \end{cases}, \quad (11)$$

where $\phi(y_l^d - y_l^o)$ is the combination of resources allocated by the elite to the dispute of political power and to populist redistribution that would dissuade the poor class from challenging the elite's control of political power.

4.3.2. The Ruling Elite

Expected consumption of the ruling elite is given by:

$$c_e = q(y_e^o - g) + (1 - q)y_e^d - g_e, \quad (12)$$

The elite chooses g_e , and sets up a system of income transfer equal to g (that will be undertaken only if the elite remains in power) in order to maximize c_e subject to the following constraints:

$$g_e + \phi g \leq \phi(y_l^d - y_l^o), \quad (13)$$

$$g_e \geq \varepsilon , \quad (14)$$

$$g \geq 0, \quad (15)$$

where ε is an arbitrarily small number. The first constraint (equation 13) says that the ruling elite will not choose a combination of resources allocated to the dispute of political power and populist redistribution that is larger than that necessary to deter the poor class from challenging its control of political power. The second constraint (equation 14) would only require that g_e be greater than zero. However, since the probability of the elite remaining in power (given by equation 8) is not defined for $g_e = g_l = 0$, we will assume that the elite chooses at least a minimum amount of resources to defend its control of political power $\varepsilon > 0$.²³ The last constraint (equation 15) restricts the amount of populist redistribution to be non-negative.

Let $\lambda_1, \lambda_2, \lambda_3 \geq 0$ be the Lagrange multipliers associated with constraints 13 through 15, respectively.

In making these choices, the elite takes into account not only the direct effect of g_e on q , but also the indirect effect of g_e and g on g_l (see equation 11).

The elite's choice of g_e satisfies the following first order condition²⁴:

$$\left(\frac{\partial q}{\partial g_e} + \frac{\partial q}{\partial g_l} \frac{dg_l}{dg_e} \right) (y_e^o - y_e^d - g) - 1 - \lambda_1 + \lambda_2 = 0, \quad (16)$$

and the choice of populist redistribution, g , satisfies the first order condition:

$$\frac{\partial q}{\partial g_l} \frac{\partial g_l}{\partial g} (y_e^o - y_e^d - g) - q - \lambda_1 \phi + \lambda_3 = 0. \quad (17)$$

²³This assumption is made only for analytical convenience. An alternative way of getting around this problem would be to assume that equation 8 is:

$$q = \begin{cases} \frac{g_e}{g_e + \phi g_l} & \text{for } g_l > 0 \\ 1 & \text{for } g_l = 0 \end{cases} .$$

²⁴It should be noted that the interior solution of the elite's problem is a saddle (the details are contained in Appendix 1). This information is used when solving the problem in order to rule out the interior solution as one of the possible equilibria.

4.4. Equilibrium

The derivation of the equilibrium yields the results summarized in the following propositions (see Appendix 2 for the full derivations):

Proposition 1 (Democracy): If $y_e^o < y_e^d$, the ruling elite extends democracy and the equilibrium is such that:

- i. The poor class chooses $g_l = 0$,
- ii. The ruling elite chooses $g_e = 0$, and
- iii. The regime remains democratic with probability one.

Proposition 2 (Military deterrence): If $y_e^o > y_e^d$, $\phi < 1$, and $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} > 2\phi$, the equilibrium is such that:

- i. The poor class chooses $g_l = 0$,
- ii. The ruling elite chooses $g_e = \phi(y_l^d - y_l^o)$, and $g = 0$, and
- iii. The regime remains oligarchic with probability one.

Proposition 3 (Populist Deterrence): If $y_e^o > y_e^d$, $\phi > 1$, and $\frac{1}{4\phi} \frac{y_e^o - y_e^d}{y_l^d - y_l^o} + \frac{y_l^d - y_l^o}{y_e^o - y_e^d} + \varepsilon \frac{(\phi - 1)}{\phi(y_e^o - y_e^d)} - 1 < 0$, the equilibrium is such that:

- i. The poor class chooses $g_l = 0$,
- ii. The ruling elite chooses $g_e = \varepsilon$ (the minimum possible) and $g = y_l^d - y_l^o - \frac{\varepsilon}{\phi}$, and
- iii. The regime remains oligarchic with probability one.

Proposition 4 (Dispute of Political Power): If $y_e^o > y_e^d$, $\phi < 1$, and $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} < 2\phi$, or, if $y_e^o > y_e^d$, $\phi > 1$, and $\frac{1}{4\phi} \frac{y_e^o - y_e^d}{y_l^d - y_l^o} + \frac{y_l^d - y_l^o}{y_e^o - y_e^d} + \varepsilon \frac{(\phi - 1)}{\phi(y_e^o - y_e^d)} - 1 > 0$, the equilibrium is such that:

- i. The poor class chooses $g_l = \frac{y_e^o - y_e^d}{2\phi} \left(1 - \frac{1}{2\phi} \frac{y_e^o - y_e^d}{y_l^d - y_l^o} \right) > 0$,
- ii. The ruling elite chooses $g_e = \frac{1}{4\phi} \frac{(y_e^o - y_e^d)^2}{y_l^d - y_l^o}$, and
- iii. The probability that the regime remains oligarchic, q , is given by $q = \frac{1}{2\phi} \frac{y_e^o - y_e^d}{y_l^d - y_l^o}$.

Figure 2 summarizes the previous propositions for the case where $\varepsilon \rightarrow 0$.²⁵

[INSERT FIGURE 2 HERE]

²⁵The last part of Appendix 2 defines and explains the borders of the regions in Figure 2.

5. Analysis of the Main Results

This section presents an analysis of the equilibrium of the model and provides the comparative statics results derived from numerical simulations. More precisely, we would like to know how the equilibrium level of populist redistribution, repression, or the resources allocated to conflict change as the parameters of the economy change (initial wealth inequality, the amount of wealth redistribution that the poor class can implement in a democratic regime, and the relative importance of the human capital externality in production).

Note from Propositions 1 through 4 that as $\varepsilon \rightarrow 0$, the resulting equilibrium depends only on the parameter space $\left[\phi, \frac{y_e^o - y_e^d}{y_l^d - y_l^o} \right]$. Recall that ϕ measures the relative efficiency of the resources that the poor class allocates to the dispute of political power with the elite. The other term, $\frac{y_e^o - y_e^d}{y_l^d - y_l^o}$, can be referred to as the ratio of incentives to dispute political power. In other words, this term is the elite's incentive to maintain political power *vis-à-vis* the poor's incentive to challenge it. If this ratio is high enough, it is relatively cheap for the elite to deter the poor class from attempting a revolution. However, as explained in the beginning of the paper, it was not *a priori* clear whether the elite would use military repression, populist redistribution, or both, to deter any attempt of revolution. But the results from the model are clear (and simple) in this respect: if the ratio of incentives to dispute political power is high enough, and the relative efficiency of resources allocated by the poor to challenge the elite's control of political power, ϕ , is greater than one, the elite prefers to use populist redistribution and the minimum level possible of military expenditure. In other words, if the poor are more efficient than the elite in the conflict over political power and the ratio of incentives to dispute political power is high enough relative to ϕ , the elite will use populist redistribution to deter the poor. In contrast, if ϕ is smaller than one, and the ratio of incentives to dispute political power is high enough relative to ϕ , then it is cheaper for the elite to deter the working class using military repression, as they would only need to use a fraction $\phi < 1$ of the amount that they would need to use if they wanted to deter the poor with populist redistribution.

To understand under what circumstances the elite would choose not to deter the poor from attempting a revolution note that, *ceteris paribus*, as $y_l^d - y_l^o$ increases ($\frac{y_e^o - y_e^d}{y_l^d - y_l^o}$ decreases) the cost of repression becomes higher, and, at some point, the elite finds it optimal to engage in a dispute with the poor class over the control of political power rather than completely repressing a revolution attempt by the latter group. On the one hand, if $\phi < 1$, military repression is the equilibrium outcome as long as the ratio of incentives to dispute political control is high enough relative to the poor's efficiency in disputing political power

(ϕ). On the other hand, if $\phi > 1$, using populist redistribution is more advantageous for the elite than engaging in a dispute with the working class for the control of political power if ϕ is sufficiently large relative to the ratio of incentives to dispute the control of political power ($\frac{y_e^o - y_e^d}{y_l^d - y_l^o}$) (see Figure 2).

Note that, in equilibrium, if the elite deters the poor from attempting a revolution, it does so using either military repression or populist redistribution, but not both at the same time. In other words, according to the model, military repression and populist redistribution are not used at the same time.

5.1. Comparative Static Results

In this subsection we conduct comparative statics of the main results of the model. We are particularly interested in determining what the model has to say regarding the relationship between the amount of populist redistribution and: the initial level of wealth inequality, the amount of redistribution that would take place under democracy, and the relative importance of the human capital externality in production.²⁶ We will use numerical simulations to understand how the terms $\frac{y_e^o - y_e^d}{y_l^d - y_l^o}$, and $y_l^d - y_l^o$ change as the key parameters of the model change.²⁷ Also, we are interested in understanding how the changes in the parameter

of the model affect the likelihood of a populist (or military) deterrence equilibrium, or the likelihood of a transition to democracy.

We summarize the main results derived from the numerical simulations in the remainder of this section.²⁸

1a. *Populist redistribution, if any, increases with (initial) wealth inequality.*

²⁶Note that the results we will derive in this section regarding how populist redistribution changes with some key parameters of the model can be directly translated to the case of military repression. Remember that if populist deterrence is the equilibrium outcome, g (the amount of populist redistribution) is equal to $y_l^d - y_l^o$. In contrast, if military repression is the equilibrium outcome, the amount of resources used to deter the poor from attempting a revolution is equal to $\phi(y_l^d - y_l^o)$.

²⁷In the simulations we will assume that $\eta = 1 - \alpha$ (see equation 3). The parameter values that we use in the baseline simulations are: $p = 0.8$, $\alpha = 0.9$, $\eta = 1 - \alpha = 0.1$, $\gamma = 0.8$, $\bar{e} = 4$, $d^o = 10$, and $\theta = 0.9$. Note that $\bar{e} = 4$, and $d^o = 10$, imply that $e_e^o = 12.5$ and $e_l^o = 2.5$. In words, in the baseline scenario, members of the elite have five times as much wealth as members of the poor class. All the results presented in points 1, 2, and 3 are robust to large variations in the parameters of the model.

²⁸Figures summarizing all the comparative statics results described below are available from the authors upon request.

First we ask how populist redistribution ($g = y_l^d - y_l^o$) changes as the measure of wealth inequality in the oligarchic regime, d^o , changes.²⁹ Note that by changing d^o we are inducing a mean preserving spread in the distribution of wealth in the oligarchic regime (the initial level of wealth inequality). In other words, as d^o increases, the measure of wealth inequality increases, but the mean endowment (wealth) in the population remains constant.

For a given level of θ (a measure of the amount of wealth redistribution that can take place under democracy), a higher level of inequality in the distribution of wealth increases the elite's as well as the poor's incentive to dispute political power. As a result, an increase in (initial) wealth inequality increases the amount of populist redistribution necessary for deterring the poor from attempting a revolution. This is because the optimal level of populist redistribution (if any) is equal to the poor class' incentive to challenge the elite's control of political power (see Proposition 3, point ii. above). Also, populist redistribution as a percentage of the income of the poor increases with initial wealth inequality.

1b. *The ratio of incentives to dispute political power decreases as wealth inequality increases. Furthermore, if wealth inequality is high enough, a conflict for the control of political power is the equilibrium outcome (with no populist redistribution) and the probability that the economy transits to democracy increases with wealth inequality.*

As (initial) wealth inequality increases ($\uparrow d^o$), the ratio of incentives to dispute political power decreases. This happens because, as wealth inequality increases, the incentive for the poor to dispute political power (the denominator in expression $\frac{y_e^o - y_e^d}{y_l^d - y_l^o}$) increases faster than the elite's incentive to defend it (the numerator). This result, in turn, follows from the assumption that human capital is a strictly concave function of wealth ($\gamma < 1$).³⁰

Although the elite's incentive to persuade the poor class from attempting a regime change increases as wealth inequality increases, the poor class' incentive increases faster and, as a result, populist redistribution becomes more costly for the elite. For a high enough level of initial wealth inequality, it's on the elite's interest not to persuade the poor from attempting a regime change (using populist redistribution), but rather to engage in a dispute with them for the control of political power.³¹

2a. *As the amount of redistribution that can be undertaken in a democratic regime*

²⁹By doing this we are implicitly assuming that $\phi > 1$ and that we are in the parameter space's region where populist deterrence is the equilibrium outcome (see Figure 2). All the results derived in this section regarding how populist redistribution changes as the fundamental parameters change mirror those that would result in the case where $\phi < 1$, where military deterrence (repression) is the equilibrium outcome.

³⁰That is, the result follows from Jensen's inequality.

³¹This result follows the fact that the ratio of incentives to dispute political power decreases as wealth inequality increases and from Proposition 4, point iii.

increases, so does populist redistribution, if any.

A decrease in θ means that wealth inequality in the democratic regime would be lower relative to inequality in the oligarchic regime.³²

If the economy is in the region of the parameter space where populist redistribution is the equilibrium outcome, a higher level of redistribution under democracy (lower θ) increases the poor's income under this political regime and therefore increases the amount of populist redistribution (and populist redistribution as a percentage of the poor's income) necessary to deter the poor from attempting a regime change. For instance, if there are institutional rules that limit the amount of redistribution that the poor can undertake in a democratic regime, or, if the elite can avoid redistribution in democracy by, for instance, moving their wealth abroad, then the amount of populist redistribution necessary to deter the poor from attempting a regime change would be lower.

2b. *The ratio of incentives to dispute political power increases as the amount of redistribution that can be undertaken in a democratic regime increases. If redistribution under democracy is low enough, a conflict for the control of political power is the equilibrium outcome (with no populist redistribution) and the probability that the economy transits to democracy decreases with the amount of wealth redistribution that can be undertaken in a democratic regime.*

A decrease in θ increases the incentive of the poor to dispute political power as well as the elite's incentive to defend it. However, the elite's incentive increases faster than the poor's incentive, and, as a result, the ratio of incentives to dispute political power increases. Although this result seems counter-intuitive at first sight (because one would expect that the poor's incentive increases faster than the elite's, given that human capital is a strictly concave function of wealth), the assumption that $p > 1/2$ (the poor class is the majority in the population) means that the effect on wealth of an increase in redistribution under democracy is larger for the elite than it is for the poor.³³

If the parameters of the model are such that the equilibrium is one with conflict for the control of political power (a situation that is more likely when, given other parameters, the amount of wealth that can be redistributed under democracy is low), the probability that the economy transits to democracy decreases as the amount of wealth redistribution that

³²Recall that the parameter $\theta = |d^d|/d^o < 1$ captures how smaller would the measure of inequality be in a democratic regime relative to that in the *status quo* (oligarchy).

³³Note that a decrease in θ affects only the terms y_e^d and y_l^d in the expression $\frac{y_e^o - y_e^d}{y_l^d - y_l^o}$. Furthermore, note from equations 5 and 7 that a change in θ is multiplied by $p (> 1/2)$ in equation 5 and by $1 - p (< 1/2)$ in equation 7.

can be undertaken under democracy increases.^{34, 35}

3a. *As the relative importance of the human capital externality in production increases, populist redistribution, if any, decreases.*

An increase in η relative to α means that the human capital externality becomes more important in determining individual's income.³⁶ Because the difference between the poor class' human capital and average human capital in the economy is larger under oligarchy than under democracy, an increase in the relative importance of the human capital externality in production has a larger marginal (increasing) effect on the poor class' income under oligarchy than under democracy.³⁷ As a result, populist redistribution, if any, decreases as the relative importance of the human capital externality in production increases.

3b. *The ratio of incentives to dispute political power decreases as the relative importance of the human capital externality in production increases. Furthermore, if the relative importance of the human capital externality in production is high enough, a conflict for the control of political power is the equilibrium outcome (with no populist redistribution) and the probability that the economy transits to democracy increases as the relative importance of the human capital externality increases.*

While the elite's income in both regimes decreases as the relative importance of the human capital externality increases, the poor class' income increases in both regimes. These results follow from equation 3 by noticing that a higher weight in the determination of income is put on the average level of human capital in the population (which is lower than the elite's human capital, but larger than the poor's). Furthermore, given that the difference between the elite's human capital and average human capital in the economy is larger under oligarchy than under democracy, an increase in the relative importance of the human capital externality has a larger marginal (decreasing) effect on the elite's income under oligarchy than under democracy. As a result, the elite's incentive to defend its control of political power decreases as the relative importance of the human capital externality in production increases. Also, as we saw before (result 3a), the poor class' incentive to challenge the elite's control of political power also decreases as the relative importance of the human capital externality in production increases. However, the elite's

³⁴This result follows from the fact that the ratio of incentives to dispute political power increases with the amount of wealth redistribution in a democratic regime and from Proposition 4, point iii.

³⁵This prediction accords with the evidence in Lizzeri and Persico (2004) according to which the expansion of the franchise in Britain was not associated with a large redistribution of resources from the elite to the masses.

³⁶Recall that for the simulation exercise we are assuming that $\eta = 1 - \alpha$.

³⁷In other words, although both y_i^d and y_i^o increase as η increases, y_i^o increases faster than y_i^d .

incentive to defend its control of political power decreases more rapidly than the poor's incentive to challenge it and, as a result, the ratio of incentives to dispute political power decreases as the importance of the human capital externality in production increases.

When the relative importance of the human capital externality is large enough, the equilibrium is one with conflict for the control of political power, and the probability that the economy makes a transition to democracy increases as the relative importance of the human capital externality in production increases.³⁸

6. Concluding Remarks

This paper develops a political economy model that explains the means used by oligarchic political regimes to perpetuate their control of political power, namely, military repression, and populist redistribution. The model also accounts for situations where the oligarchic regime's elite decides not to deter the poor from attempting a revolution and, as a result, the two groups engage in a dispute for the control of political power. Yet, the model also accounts for the possibility of a peaceful transition to democracy that takes place in the elite's own interest.

One of the main contributions of our analysis is to provide a rationale for why under certain circumstances ruling elites in oligarchic societies use populist redistribution rather than military repression to dissuade a poor class from attempting a revolution that seeks to change the existing political regime. While populist redistribution works by diminishing the poor class' incentive to challenge the elite's control of political power, military repression works by increasing the probability that the elite remains in power if a dispute were to take place. In other words, the model explains why, in some cases, the use of an apparently inefficient policy of populist redistribution turns out to be optimal for both groups (the ruling elite and the poor class) when the alternative is the use of military repression or the default to conflict.

Our argument for explaining these four different political scenarios (oligarchic regime with military repression, oligarchic regime with populist redistribution, conflict for the control of political power, and a democratic regime) is based on the elite's incentive to defend its control of political power *vis-à-vis* the poor's incentives to challenge it, and, on the relative efficiency of the poor in challenging the elite's power. Furthermore, each group's incentive depends on the "fundamentals" of the economy, namely, a measure of (initial) wealth inequality, the amount of redistribution that the poor (the majority) can undertake

³⁸This result follows from the fact that the ratio of incentives to dispute political power decreases as the importance of the human capital externality increases and from Proposition 4, point iii.

if the regime was a democracy, and the relative importance of a Lucas-type human capital externality in production.

The model not only provides an explanation for the existence of different political regimes but, also, can shed some light on the understanding of political regime transitions. In a broad sense, we can conjecture (using the model) that the political history of Latin America during the 20th century can be divided into four epochs. The first being an epoch where oligarchic regimes used primarily military repression to deter revolutionary attempts (late 19th century and beginning of the 20th century). This epoch was followed by one where populist redistribution to the poor was the predominant means used by oligarchic government's elites to placate any attempt by the poor to change the political regime (second quarter of the 20th century and the beginning of the second half of the 20th century). During a third epoch, the second half of the 20th century, Latin America witnessed disputes -many times violent - between pro-oligarchic and pro-democratic forces for the control of political power. Only a few countries in Latin America today have managed to make it into a fourth epoch, that of consolidated democracies.

According to our interpretation, behind the explanation of the transition between these different political regimes in Latin America lies a decrease in economic inequality, an increase in the institutional limitations on the amount of redistribution that can be implemented in a democratic regime, an increase in openness that allows wealth to be transferred abroad in case of a threat of massive expropriation, an increase in the relative importance of human capital externalities in the production process, and a better organization and representation of the working classes in the political arena (an increase in ϕ , in terms of our model). While this last paragraph is only a (perhaps valid) conjecture, the understanding of political regime transitions in Latin America and its main determinants doubtlessly deserves further research.

Appendix 1

The Elite's problem

Using equations 8 and 11 to replace in equation 12, and constraints 13 through 15, the Lagrangian of the elite's problem is:

$$L(.) = \sqrt{\frac{g_e}{\phi(y_l^d - y_l^o - g)}}(y_e^o - y_e^d - g) + y_e^d - g_e \quad (\text{A1-1})$$

$$+ \lambda_1 [\phi(y_l^d - y_l^o - g) - g_e] + \lambda_2(g_e - \varepsilon) + \lambda_3 g$$

Before continuing with the full set of Kuhn-Tucker conditions (Appendix 2), note the following:

- i. With the assumption that $g_e > \varepsilon$, we know that a solution to the elite's maximization problem exists (as we have a continuous function defined on a compact set).
- ii. The interior solution to the elite's maximization problem is a saddle point. Using equation A1-1, the Hessian matrix of the elite's problem is:

$$H = \begin{bmatrix} -\frac{1}{4g_e} \sqrt{\frac{1}{\phi g_e (y_l^d - y_l^o - g)}} (y_e^o - y_e^d - g) & \frac{1}{2} \sqrt{\frac{1}{\phi g_e (y_l^d - y_l^o - g)}} \left(\frac{y_e^o - y_e^d - g}{2(y_l^d - y_l^o - g)} - 1 \right) \\ \frac{1}{2} \sqrt{\frac{1}{\phi g_e (y_l^d - y_l^o - g)}} \left(\frac{y_e^o - y_e^d - g}{2(y_l^d - y_l^o - g)} - 1 \right) & \frac{1}{4} \sqrt{\frac{g_e}{\phi (y_l^d - y_l^o - g)}} \frac{3(y_e^o - y_e^d - g) - 4(y_l^d - y_l^o - g)}{(y_l^d - y_l^o - g)^2} \end{bmatrix},$$

where the first leading principal: $|A_1| = -\frac{1}{4g_e} \sqrt{\frac{1}{\phi g_e (y_l^d - y_l^o - g)}} (y_e^o - y_e^d - g) < 0$, and the second leading principal: $|A_2| = [(y_l^d - y_l^o - g) - (y_e^o - y_e^d - g)]^2 \geq 0$.

Appendix 2

Derivation of the Equilibrium

First, we rewrite the first order conditions of the elite's maximization problem. Using equation 8 to calculate $\frac{\partial q}{\partial g_e}$ and $\frac{\partial q}{\partial g_l}$, equation 16 becomes:

$$\frac{y_e^o - y_e^d - g}{y_l^d - y_l^o - g} \left(\frac{g_l}{g_e} - \frac{dg_l}{dg_e} \right) - 1 = \lambda_1 - \lambda_2, \quad (\text{A2-1})$$

where:

$$\frac{dg_l}{dg_e} = \begin{cases} \frac{1}{2} \sqrt{\frac{y_l^d - y_l^o - g}{\phi g_e}} - \frac{1}{\phi} & \text{for } 0 < g_e + \phi g < \phi(y_l^d - y_l^o) \\ 0 & \text{for } g_e + \phi g \geq \phi(y_l^d - y_l^o) \end{cases}.$$

Using equation 8 to calculate $\frac{\partial q}{\partial g_l}$, equation 17 becomes:

$$-\frac{y_e^o - y_e^d - g}{y_l^d - y_l^o - g} \frac{\partial g_l}{\partial g} - q = \lambda_1 \phi - \lambda_3, \quad (\text{A2-2})$$

where:

$$\frac{\partial g_l}{\partial g} = \begin{cases} -\frac{1}{2} \sqrt{\frac{g_e}{\phi(y_l^d - y_l^o - g)}} & \text{for } 0 < g_e + \phi g < \phi(y_l^d - y_l^o) \\ 0 & \text{for } g_e + \phi g \geq \phi(y_l^d - y_l^o) \end{cases},$$

and:

$$q = \begin{cases} \sqrt{\frac{g_e}{\phi(y_l^d - y_l^o - g)}} & \text{for } 0 < g_e + \phi g < \phi(y_l^d - y_l^o) \\ 1 & \text{for } g_e + \phi g \geq \phi(y_l^d - y_l^o) \end{cases}.$$

The Kuhn-Tucker conditions are:

$$\begin{aligned} \lambda_1 &\geq 0 & \frac{\partial L}{\partial \lambda_1} &= \phi(y_l^d - y_l^o - g) - g_e \geq 0 & \lambda_1 [\phi(y_l^d - y_l^o - g) - g_e] &= 0 \\ \lambda_2 &\geq 0 & \frac{\partial L}{\partial \lambda_2} &= g_e - \varepsilon \geq 0 & \lambda_2 (g_e - \varepsilon) &= 0 \\ \lambda_3 &\geq 0 & \frac{\partial L}{\partial \lambda_3} &= g \geq 0 & \lambda_3 g &= 0 \end{aligned}$$

Using the information from Appendix 1, as well as the Kuhn-Tucker conditions, in principle, there are six possible cases:

Case IA		Case IB	
$\lambda_1 = 0$, and	$\phi(y_l^d - y_l^o - g) - g_e > 0$	$\lambda_1 = 0$, and	$\phi(y_l^d - y_l^o - g) - g_e > 0$
$\lambda_2 \geq 0$, and	$g_e = \varepsilon$	$\lambda_2 \geq 0$, and	$g_e = \varepsilon$
$\lambda_3 \geq 0$, and	$g = 0$	$\lambda_3 = 0$, and	$g > 0$
Case IIA		Case IIB	
$\lambda_1 = 0$, and	$\phi(y_l^d - y_l^o - g) - g_e > 0$	$\lambda_1 = 0$, and	$\phi(y_l^d - y_l^o - g) - g_e > 0$
$\lambda_2 = 0$, and	$g_e > \varepsilon$	$\lambda_2 = 0$, and	$g_e > \varepsilon$
$\lambda_3 \geq 0$, and	$g = 0$	$\lambda_3 = 0$, and	$g > 0$
Case IIIA		Case IIIB	
$\lambda_1 \geq 0$, and	$\phi(y_l^d - y_l^o - g) - g_e = 0$	$\lambda_1 \geq 0$, and	$\phi(y_l^d - y_l^o - g) - g_e = 0$
$\lambda_2 = 0$, and	$g_e > \varepsilon$	$\lambda_2 \geq 0$, and	$g_e = \varepsilon$
$\lambda_3 \geq 0$, and	$g = 0$	$\lambda_3 = 0$, and	$g > 0$

Analysis of the different cases:

1. Case IA satisfies the first order conditions if:

$$(iaa) \varepsilon \geq \frac{1}{4\phi} \frac{(y_e^o - y_e^d)^2}{y_l^d - y_l^o}, \text{ and for (iab) } \frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2.$$

Case IIA satisfies the first order conditions for:

$$(iiaa) \frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2. \text{ Furthermore, the level of } g_e \text{ that solves equation A2-1 in this case is } g_e = \frac{1}{4\phi} \frac{(y_e^o - y_e^d)^2}{y_l^d - y_l^o}.$$

Note that if condition (iaa) holds with equality, cases IA and IIA are equivalent (in terms of c_e). However, if (iaa) holds with strict inequality, the elite's consumption is larger under case IIA than under case IA (that is: $c_e^{IIA} > c_e^{IA}$).

Proof: Let $\varepsilon = \frac{\beta^2}{4\phi} \frac{(y_e^o - y_e^d)^2}{y_l^d - y_l^o}$, with $\beta > 1$. Using the last expression, the conditions of Case IA, and equations 8 and 11 to replace in equation 12, we have:

$$c_e^{IA} = \frac{\beta}{2\phi} \frac{(y_e^o - y_e^d)^2}{y_l^d - y_l^o} \left(1 - \frac{\beta}{2}\right) + y_e^d. \text{ Furthermore, using the level of } g_e \text{ that solves the first order conditions in Case IIA, the conditions of Case IIA, and equations 8 and 11 to replace in equation 12, we obtain: } c_e^{IIA} = \frac{1}{4\phi} \frac{(y_e^o - y_e^d)^2}{y_l^d - y_l^o} + y_e^d. \text{ Finally, note that } c_e^{IIA} > c_e^{IA} \text{ if } (\beta^2 - 1)^2 > 0.$$

2. Case IB satisfies the first order conditions if:

(iba) $\varepsilon \geq \frac{1}{4\phi} \frac{(y_e^o - y_e^d - g)^2}{y_l^d - y_l^o - g}$, and for (ibb) $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2$. Furthermore, the level of g that solves equation A2-2 in this case is $g = 2(y_l^d - y_l^o) - (y_e^o - y_e^d)$.

Case IIB satisfies the first order conditions for:

(iiba) $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2$. Furthermore, the level of g_e that solves equation A2-1 in this case is $g_e = \frac{1}{4\phi} \frac{(y_e^o - y_e^d - g)^2}{y_l^d - y_l^o - g}$, and the level of the level of g that solves equation A2-2 in this case is $g = 2(y_l^d - y_l^o) - (y_e^o - y_e^d)$.

Note that if condition (iba) holds with equality, cases IB and IIB are equivalent (in terms of c_e). However, if (iba) holds with strict inequality, the elite's consumption is larger under case IIB than under case IB (that is: $c_e^{IIB} > c_e^{IB}$).

Proof: Let $\varepsilon = \frac{\beta^2 (y_e^o - y_e^d - g)^2}{4\phi (y_l^d - y_l^o - g)}$, with $\beta > 1$. Using the last expression, the level of g that solves equation A2-2, the conditions of Case IB, and equations 8 and 11 to replace in equation 12, we have: $c_e^{IB} = \frac{\beta}{\phi} (2 - \beta) [(y_e^o - y_e^d) - (y_l^d - y_l^o)] + y_e^d$. Furthermore, using the levels of g_e and g that solve equations A2-1 and A2-2 respectively, the conditions of Case IIB, and equations 8 and 11 to replace in equation 12, we obtain: $c_e^{IIB} = \frac{1}{\phi} [(y_e^o - y_e^d) - (y_l^d - y_l^o)] + y_e^d$. Finally, note that $c_e^{IIB} > c_e^{IB}$ if $(\beta^2 - 1)^2 > 0$.

3. Note from the previous two points that cases IIA and IIB are possible solutions when $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2$. We can use the information obtained for each one of these two cases from the previous points to compare c_e^{IIA} and c_e^{IIB} . Comparing the expressions derived in points 1 and 2, note that $c_e^{IIA} \geq c_e^{IIB}$ if $\left(\frac{1}{2} \frac{y_e^o - y_e^d}{y_l^d - y_l^o} - 1\right)^2 \geq 0$.

So far, point 1 ruled out Case IA, point 2 ruled out Case IB, and point 3 ruled out Case IIB.

4. Case IIIA satisfies equation A2-1 and $\lambda_1 \geq 0$ for:

(iiiaa) $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} \geq 2\phi$. Furthermore, note that in this case $g_e = \phi(y_l^d - y_l^o)$. Using this last expression, and equations 8 and 11 to replace in equation 12, we obtain:
 $c_e^{IIIA} = y_e^o - \phi(y_l^d - y_l^o)$.

Case IIIB satisfies equations A2-1, A2-2, and the conditions $\lambda_1, \lambda_2 \geq 0$ for:

$\phi > 1$. Using the conditions of Case IIIB and equations 8 and 11 to replace in equation

12, we obtain: $c_e^{IIIB} = y_e^o - (y_l^d - y_l^o) - \varepsilon(1 - \frac{1}{\phi})$.

Note that with $\varepsilon \rightarrow 0$, $c_e^{IIIB} > c_e^{IIIA}$ when $\phi > 1$.

5. Using the information of point 1 and point 5, in the area of the parameter space where:

$\phi > 1$ and $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2$, there are two remaining cases: IIA and IIIB. Comparing the elite's consumption level derived above for these two cases we obtain that: $c_e^{IIA} \geq c_e^{IIIB}$ if: $\frac{1}{4\phi} \frac{y_e^o - y_e^d}{y_l^d - y_l^o} + \frac{y_l^d - y_l^o}{y_e^o - y_e^d} + \varepsilon \frac{(\phi - 1)}{\phi(y_e^o - y_e^d)} - 1 \geq 0$. Note that as $\varepsilon \rightarrow 0$, this condition reduces to $\frac{1}{4\phi} \frac{y_e^o - y_e^d}{y_l^d - y_l^o} + \frac{y_l^d - y_l^o}{y_e^o - y_e^d} - 1 \geq 0$. This last expression (when it holds with equality) generates the function that separates the region of the parameter space where there is an equilibrium with populist deterrence from that where there is a dispute of political power (see Figure 2).

The Borders of Figure 2

Using the information above, the borders of the regions in Figure 2 are defined as follows:

For all $\phi > 0$ and $y_e^o - y_e^d < 0$ the equilibrium is the extension of democracy in the elite's own interest. This happens when the human capital externalities in production are large enough to counteract the redistributive losses that come with democracy for the elite.

However, when $y_e^o - y_e^d \geq 0$ and:

· If $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2$ and $\phi \leq 1$, the border separating the region of "Military deterrence"

from that of "Dispute of Political Power" is defined by the equation: $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} = 2\phi$. When this expression holds the elite is indifferent between a conflict with the masses for the control of political power and allocating enough resources to military deterrence of revolutionary attempts by the masses.

· If $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} \leq 2$ and $\phi > 1$, the border separating the region of "Populist deterrence"

from that of "Dispute of Political Power" is defined by the equation: $\frac{1}{4\phi} \frac{y_e^o - y_e^d}{y_l^d - y_l^o} + \frac{y_l^d - y_l^o}{y_e^o - y_e^d} = 1$. If this last expression holds the elite is indifferent between a dispute of political power and spending enough resources in populist redistribution to the masses to dissuade them from attempting a political regime change.

· If $\frac{y_e^o - y_e^d}{y_l^d - y_l^o} > 2$ the border separating the region "Military deterrence" from that of "Populist deterrence" is defined by $\phi = 1$. In this case, if $\phi = 1$ the elite is just indifferent between spending military resources enough to defend its control of political power and redistributing enough income to the poor to dissuade them from attempting a revolution.

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