Political competition over property rights enforcement

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Abstract

This paper analyzes a model in which heterogeneous agents can choose to appropriate others’ resources. A qualified electorate votes over proposals by two candidate office holders to determine the property rights enforcement regime. The outside option in the political game is being a citizen under the regime implemented by the opponent and is thus generally better for higher skill candidates. So, the lower productivity candidate wins the election and implements a regime that depends on the loser’s skill level. As a consequence, two societies with the same skill distribution and the same office holder but different runner-ups in the election in terms of productivity choose different levels of enforcement. The lower the loser’s skill, the more constrained is the office holder and the better is enforcement and the economy’s outcome. Easier access to political competition increases the likelihood of better outcomes while extending the franchise alone does not.

Keywords: Political process, political institution, property rights.
JEL classification: D72, O17, P16.

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1 Introduction

I analyze a mechanism through which societies that look similar in a number of relevant characteristics choose different property rights enforcement regimes. Strategic interaction in a political game shapes the regime choice by determining the set of alternatives a society can actually choose from. I model a society’s decision making as a two-dimensional political process characterized by participation constraints. One dimension is who constitutes the qualified electorate that chooses among alternatives and thus determines the social ordering. The second one is who can access political competition to propose alternatives to choose from and, thus, determine the choice set. I show that these dimensions differ in importance.\footnote{Most would agree that the security of rights to property, i.e., the extent to which people are safe from expropriation of their resources, be it by the government or by other private agents, matters for economic outcomes and, evidently, it differs across countries. From a conceptual point of view, a society’s observed security of property rights is an equilibrium outcome. It results from the aggregation of individually optimal behavior that maximizes expected payoffs given the intensity of enforcement of those rights chosen by society. This distinction implies that property rights can be secure if either their enforcement is strong or little appropriation activity takes place. Reasonably enough, in societies that are similar in the relevant dimension of heterogeneity (often related to, e.g., ability or education), given the same enforcement regime, property should be similarly secure. As a consequence, if differences across countries are not to be explained simply by heterogeneity in their endowments, then what determines societies’ regime choices and why do those differ? What is more, if these societies also had the same social ordering of enforcement regimes, they should choose the same regime if they had the same options. So, different equilibrium outcomes in rather similar societies must originate in at least one of two separately determined ingredients for social choice: the social ordering of alternatives or the set of alternatives available. Given that societies constrain participation in the determination of these ingredients to varying degrees, which constraints on participation must be relaxed in order to improve the economic outcome and why? I study these questions in a static one-period model where heterogeneous agents can choose alternatives to the regime. The labels I use as well as the model I propose below suggest a reference to participatory environments. However, the constraints on participation allow me to analyze environments that are not a stylized democracy in which virtually everybody can vote and compete. Moreover, the use of the terms participation and political competition seems to disagree with the use frequently encountered in the political economy literature (see, e.g., Aidt and Eterovic (2011) for a description). I think of the abstract political process as capturing a society’s decision making. Participation in this process has two dimensions, proposing policies or regimes and choosing from those proposals. Less restricted participation in either dimension means that more people have an easier time doing exactly that. The language I adopt emphasizes this interpretation.}

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I study these questions in a static one-period model where heterogeneous agents can choose alternatives to the regime. The labels I use as well as the model I propose below suggest a reference to participatory environments. However, the constraints on participation allow me to analyze environments that are not a stylized democracy in which virtually everybody can vote and compete. Moreover, the use of the terms participation and political competition seems to disagree with the use frequently encountered in the political economy literature (see, e.g., Aidt and Eterovic (2011) for a description). I think of the abstract political process as capturing a society’s decision making. Participation in this process has two dimensions, proposing policies or regimes and choosing from those proposals. Less restricted participation in either dimension means that more people have an easier time doing exactly that. The language I adopt emphasizes this interpretation.

\footnote{Representatively, see Acemoglu et al. (2005) and Acemoglu and Johnson (2005) and references therein.}
between appropriation and productive activities and a political process determines the property rights enforcement regime.\textsuperscript{3} Constraints on participation are modeled as fundamental political institutions. In one dimension, access to political competition is restricted to some finite number of agents, potentially satisfying a minimum skill requirement. In the other dimension, the qualified electorate is restricted by the size and characteristics of the subset of the population that may vote.\textsuperscript{4} More precisely, a finite set of agents is drawn randomly from the population to play a selection game. They pick at most two candidates from amongst them who then compete for office in a one-shot political game. Each candidate proposes a regime consisting of a level of property rights enforcement and a tax rate to pay for implementing it as well as for his payoff while in office. The winner of the election implements the regime he proposed and receives the implied payoff. The loser continues as a citizen under the regime implemented by the winner. Thus, an agent’s outside option in the political game is his out-of-office payoff determined by the regime proposed by his opponent. This gives rise to strategic interaction so that the choice set facing the electorate and, thus, the outcome depends on the loser to-be’s productivity. In particular, the eventual loser’s out-of-office payoff under the winner’s proposed regime constrains the latter’s in-office payoff.

As one would expect, the model predicts that weaker property rights enforcement reduces productive activity, output, and welfare but raises in-office payoff. More interestingly, it creates a mechanism—the quality of the runner-up—through which two societies, with the same skill distribution and the same office holder in terms of productivity, generically choose different levels of enforcement. Forgetting about the election’s runner-up, two societies may look similar in relevant dimensions and yet different regimes prevail. Outcomes differ since the set of alternatives the qualified electorate and thus society can choose from differ. This distinguishes my paper from the literature that focuses on differences in induced preferences over a continuous choice set leading to different outcomes. Here, in fact, two societies with different outcomes can have the same preferences over any given set of alternatives— but the sets they face differ. As a further consequence of this mechanism, easier access to political competition increases the likelihood of better outcomes while extending the franchise alone does not. That is, suppose an economy starts out with a very narrow elite that exclusively can vote over proposed regimes and a subset of which exclusively can propose regimes to be chosen from. If one were to “broaden the elite” by allowing more people to participate in voting over available regimes, the society’s outcome would not change unless one also al-

\textsuperscript{3}The model is stylized in the sense that I don’t take a stand on what appropriation is. One can think of corruption or fraud as well as outright theft. In fact, appropriators could be implementing expropriation by the government. The political process models the society’s decision making.

\textsuperscript{4}It seems evident that most countries hold elections. However, “elections do not mean the same thing” in, e.g., Argentina, Mexico, Russia, and the U.S., due to differences in the degree of political competition (North et al. (2006), p. 66-67).
lows for more competition in proposing regimes.\footnote{That is, changes in the political institutions do not imply better outcomes (as discussed, e.g., by North et al. (2007), section IV).} Finally, from a political economy point of view, the model predicts that the lower productivity candidate wins the election whenever the candidates’ skills matter for the outcome.

\subsection{1.1 Related literature}

Naturally, this paper is related to and somewhat complements the literature that analyzes the interaction of economic rents and political power in shaping property rights. The exact role of limited commitment in these interactions is demonstrated in Acemoglu (2003). Acemoglu (2008) studies the tradeoff between distortions from redistribution and distortions from entry barriers. Acemoglu (2006b) analyzes how direct (expropriation through taxes) and indirect (manipulation of factor prices) extraction of rents shape property rights. The influence of economic losers on innovations are analyzed in Acemoglu and Robinson (2000). Additionally, Acemoglu and Robinson (2001b) and Acemoglu (2006a) touch on transitions between political regimes by allowing for coups and revolutions. Acemoglu and Robinson (2001a) analyze the existence of inefficient redistribution as a result of the interplay of socio-economic groups. Finally, Acemoglu and Robinson (2008) distinguish between de facto and de jure political power and analyze how investments into the former compensating changes in the latter lead to persistence of economic institutions despite changes in political institutions. All these studies have in common that political equilibrium is basically a median voter outcome. There are no strategic interactions and the majority of the population or of the politically powerful elite chooses an optimal policy or regime from a continuum of choices. The focus is on the analysis of induced preferences over possible regimes. By contrast, I focus on the determination of the set of available alternatives a society can choose from. The strategic interaction in proposing regimes allows for political institutions to matter in novel ways.

Since my setup contains a selection stage, the paper is distantly related to the literature studying citizen-candidate models as introduced by Osborne and Slivinski (1996) and Besley and Coate (1997).\footnote{For a somewhat more general discussion of selection into politics see Besley (2005).} The model analyzed here differs from these in a number of important respects. First, in the present model, the selection game is followed by an additional stage, a political game between the selected candidates. In this game, candidates can commit to implement a regime if elected which generates a strategic interaction. By contrast, other models assume no commitment and every candidate runs with his preferred policy as a platform. There is no additional game between self-selected candidates and the election winner’s preferred policy is implemented. That is, the only strategic interaction takes place in the selection stage. This approach, however, would be inappropriate for the question at hand.
The office holder’s preferences over regimes differ from the preferences he would have as a citizen. In fact, each agent’s ideal regime once in office is outright dictatorship. Second, and related to that, here, regime preferences are not single-peaked but depend on occupations chosen under the alternative regimes. Third, in contrast to these models, mine has a deterministic voting equilibrium, there are no ties that need to be split by randomization. This also implies that there is always one candidate that runs and loses with certainty. However, he does so to prevent a dictatorship and, in fact, to constrain the set of possible regimes that can be implemented. Finally, an interesting point is that this model does not feature any rents from holding office other than the payoffs generated in equilibrium from using part of the tax receipts. These rents endogenously depend on the regime implemented.

One interpretation of appropriation in my model is crime which relates the paper to the literature on crime started by Becker (1968). The present paper is closest to Imrohoroglu et al. (2000) and Benoît and Osborne (1995). Neither focuses on the kind of strategic interaction analyzed here (in fact, they focus on induced preferences.). The former studies redistribution and crime in a dynamic model where a median voter determines income taxes and enforcement expenditure. There is no room for differences in the characteristics describing the political process that fixes the enforcement regime. Benoît and Osborne (1995) analyze a model of crime in which the regime of interest is a tax schedule, social expenditure, and a punishment utility. The political mechanism assigns nonnegative weights to the preferred regimes of all (heterogeneous) agents in the economy. Differences between societies are explained by differences in wealth and inequality, crime fighting technologies, and the political system as determined by the distribution of these weights. The political process does not allow for a strategic interactions.

To the extent that appropriation in the present model can be interpreted as corruption, this paper relates to another large literature. For a positive analysis of corruption see, e.g., Rose-Ackerman (1975); for an analysis of its consequences see, e.g., Acemoglu and Verdier (2000); for an analysis of the optimal provision of incentives see e.g., Becker and Stigler (1974). I concentrate on the determinants of a society’s choice of enforcement.

2 The model

The basic environment Consider a static one-period economy with a unit measure of agents indexed by \( \iota \in [0, 1] \) and a single consumption good. Preferences are risk neutral, i.e., \( u(c) = c \). Although there is exogenous uncertainty, the qualitative results only rely on monotonicity of \( u \) since all decisions are discrete. Agents are heterogeneous with respect to

\[7\text{An overview can be found in, e.g., Aidt (2003).}\]
their productivity \( w \in [0,1] \). Assume that \( w \) is drawn from a publicly known distribution with cumulative distribution function \( F(w) \) and differentiable density \( f(w) \) on the support \( [0,1] \). Without loss of generality, order agents in \([0,1]\) according to their productivity. I call \( w \) return to market activity, productivity, and skill interchangeably and use it to refer to an agent with productivity level \( w \). In particular, \( w, w', \) and \( w'' \) refer to generic skill levels and, thus, agents. Finally, agents are endowed with one unit of time that is supplied inelastically to one of two sectors. An agent with productivity \( w \in [0,1] \) can decide to either produce \( w \) units of the consumption good or engage in appropriation efforts. There is also an outside option, a non-market activity, e.g., home production, that gives \( \alpha w \), for some small nonnegative \( \alpha < 1 \), which is neither taxable nor appropriable. Assume that, if agents are indifferent between production and appropriation, then they choose appropriation while, if they are indifferent between one of the two occupations and home production, then they choose the occupation. Home production is introduced solely to simplify the analysis in special cases.\(^8\) In most of the analysis, I thus assume that \( \alpha \) is small enough to never bind and ignore it unless stated otherwise.\(^9\) Let \( \Omega, \Omega^c \), and \( \Xi \) be the sets of producers, appropriators, and home producers with measures \( \omega, \omega^c, \) and \( \xi \) respectively. These are equilibrium objects. Producers pay a proportional tax \( \tau \in [0,1] \) on their income. After production and tax payments and before consumption, agents are randomly matched with each other. That is, every agent can meet either an appropriator, a producer, or a home producer. I assume that the probability \( p \) of any agent meeting an appropriator equals the measure of appropriators, \( \omega^c \), while the probability \( q \) of any agent meeting a producer equals the measure of producers, \( \omega \).\(^{10}\) If a producer with productivity \( w \) is matched with an appropriator, he loses a fraction \( \theta \) of his resources and keeps \((1-\theta)(1-\tau)w\).\(^{11}\) The expression \( 1-\theta \) can be thought of as representing the quality

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\(^8\)In particular, \( \alpha \) bounds the payoff from market activity offered by any office holder away from zero. It thereby ensures that the existence of equilibria in the cases with a dictator and when there is no commitment is robust to changing the tie breaking rule in the occupational choice between market and appropriation activity. Moreover, and more importantly, it simplifies and clarifies the discussion of some assumptions made in the analysis below.

\(^9\)However, the case of a dictator as well as a case I refer to as “anarchy” are needed to properly specify the payoffs in the selection game lateron. Thus, I formulate the model and the definition of competitive equilibrium including this option. The assumption “\( \alpha \) is small enough” is made more precise in section 3.3.

\(^{10}\)These matching probabilities arise as a special case of a more general matching technology. Assume for the moment that \( \omega^c = 1-\omega \); i.e., there are only producers and appropriators. Let the measure of matches between producers and appropriators be given by \( M(\omega,1-\omega) = \mu \omega^\alpha (1-\omega)^\beta \), where \( \mu > 0, \alpha, \beta \in [0,1] \). Define \( \phi \equiv \frac{\omega^c}{1-\omega} \). The probability of a producer meeting an appropriator is \( p = \frac{M(\omega,1-\omega)}{\omega} = \mu \omega^\alpha (1-\omega)^\beta = \frac{\mu(1-\omega)^\beta}{\omega^{\alpha+1}} \). Similarly, the probability of an appropriator meeting a producer is \( q = \frac{M(\omega,1-\omega)}{1-\omega} = \frac{\mu \omega^\alpha (1-\omega)^\beta}{(1-\omega)^{\alpha+1}} \). Note that \( q = \phi p \). The special case adopted here is \( \mu = 1-\omega, \alpha = 1, \beta = 1-\alpha \). Regarding the qualitative properties of the matching probabilities, this simplification is innocuous, i.e., the effects of a change in the relative measures are unaltered.

\(^{11}\)I assume that the fraction of resources that an appropriator can acquire is independent of his skill. The activities of interest are outright theft, simple fraud, property crimes, and corruption rather than more skill-intensive crimes like, e.g., financial fraud. I abstract from appropriation targeted at producers of particular skill levels. These assumptions simplify the analysis and affect the results. In particular, in combination with
of property rights enforcement. If he meets another producer or a home producer, then they just chat and walk off. On the other hand, if an appropriator meets a producer with productivity $w$, he runs off with the fraction $\theta(1 - \tau)w$. If he meets another appropriator or a home producer, then there is nothing to appropriate and both walk off empty-handed.

**The enforcement technology** There is a technology that enforces (secures) the fraction $1 - \theta$ of a producer’s output in a meeting with an appropriator at a cost $g(\theta)$. I assume that $g : [0, 1] \rightarrow \mathbb{R}_+$ is twice continuously differentiable on the interior of its domain, strictly decreasing and strictly convex, $g'(\theta) < 0$ and $g''(\theta) > 0$. Moreover, I assume that perfect enforcement is not affordable, $g(0) \geq 1$, and no enforcement does not cost anything, $g(1) = 0$. For technical reasons the limit conditions $\lim_{\theta \to 0} g'(\theta) \leq -1$ and $\lim_{\theta \to 1} g'(\theta; w) > -\infty$ are imposed. I don’t rule out fixed costs. As long as the technology does not depend too much on the office holder’s skill and potential office holders are sufficiently productive, the results don’t change. It is possible to overturn them by allowing for the technology to vary a lot with the office holder’s skill. However, I argue that being good at doing business does not imply being good at providing a favorable environment for doing business. The political dimension in this model is not even the latter but actually unrelated to doing business per se. Moreover, a skill dependent technology blurs the implications of the strategic interaction.

**The political process** In the beginning of the period, a finite number $n$ of potential candidate politicians, $N = \{w_1, \ldots, w_n\}$, are drawn from the population. Without loss of generality, we can assume that they are ordered according to their skill level, where $w_1$ and $w_n$ refer to the lowest and the highest skill level, respectively. Given $N$, there potentially is an election that decides who is to be in charge of administering the technology. At most two agents can run for office. Each agent in $N$ can observe all others’ marginal productivities and decides other assumptions, they potentially affect the existence of pooling equilibria.

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12A measure of the security of property rights in this model is $p(1 - \theta) + (1 - p) = (1 - p\theta)$. This captures the identification problem which is part of the motivation for this paper. Secure property rights can prevail for any enforcement regime if the probability of meeting an appropriator is small as well as for any probability of meeting an appropriator if the enforcement is strong. For societies that are similar in the relevant dimension of heterogeneity, given the same $\theta$, the occupation decisions and thus the probability $p$ should be similar. Similarly, facing the same set of alternatives when choosing an enforcement regime, they should choose the same regime. That is, the equilibrium outcome in rather similar societies must originate in the set of alternatives available to society. This is the focus of this paper.

13Sufficient conditions for the technology are $-g_w(\theta; w) < \alpha$ for all $(\theta, w) \in (0, 1)^2$ and $g_w(\theta; w) = 0$ for all $\theta < \hat{\theta}$ and $w \in [0, 1]$, where $\hat{\theta}$ is determined by the economy’s fundamentals as shown below. A sufficient (but by no means necessary) condition for the set of potential candidates is that all agents have at least the median skill. Some qualifying restrictions need obvious adjustments.

14However, the results would go through, if one where to assume that there are agents that cannot operate the technology but for all agents that can, the technology is independent of the skill. Assume that, for instance, running the technology requires a minimum skill level. Then, the analysis below would still go through unaltered for the set of agents that can run it.
whether or not he wants to run. If there is no candidate for office, then the “anarchy” regime is given by \((\theta, \tau) = (1, 0)\), i.e., no taxes are paid and no enforcement takes place at all. If there is only one candidate, then he becomes a dictator. If there are exactly two candidates, then the two of them run for office in an election. If there are more than two potential candidates, then two of them are drawn at random with equal probability for all candidates. Refer to the candidates for office as \(w_L\) and \(w_H\), where \(w_L < w_H\). They compete by simultaneously announcing and committing to implement an effective (actually collected) proportional tax rate \(\tau \in [0, 1]\) and a secure fraction \((1 - \theta)\), \((\theta, \tau) \in [0, 1]^2\), where the former raises the funds to pay for the latter. The rest of the population votes for one candidate according to their preferences over regimes proposed. The regime voted for by the majority wins. Assume that draws between candidates (regimes) are split with equal probability of success on both the individual (a single voter) and the aggregate (the voting body) level. The agent that wins the election and becomes the office holder assumes a full time occupation that is administrative and can neither produce, nor home produce, nor appropriate. He receives a payoff \(\tilde{w}\) which is defined below as the residual from subtracting the cost of implementing \(\theta\) from the tax receipts. This payoff is neither subject to appropriation nor taxation (consider it to be a net payoff). I assume that the skill of a voter is not observable ex ante so that nobody can be excluded from voting because he would be an appropriator under some regime. In section 3.4, I develop additional notation to analyze restrictions in two dimensions of participation in the process, political competition (section 3.4.1) and the qualified electorate (section 3.4.2).

**Equilibrium selection** As specified so far, the model has multiple equilibria. The reason for and the nature of this multiplicity is discussed in section 4.1.1. I assume that there is an

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15The assumption that only a subset \(N\) of the population can choose whether or not to run for office accounts for the perception that, in reality, not everybody can run for office. Possible restrictions on the set of agents that can do so are, e.g., a minimum education requirement or some kind of connections or status established by inheritance or economic success.

16While the commitment assumption is not innocuous (see Ferejohn (1986) and Barro (1973) for some treatment of the problem), notice that this assumption per se does neither rule out in-office rents from weak institutions nor that a society looks similar to one run by a dictator. Without commitment, once in office, independent of his skill level and model parameters, all agents would choose to implement a dictatorship and everybody knows that. So, commitment basically rules out outright dictatorship after an election. There are conceivable assumptions, some wild, some reasonable, that ensure that the office holders are deterred from deviating from their proposed schedule. As an example, consider a situation, where the office holder’s security is waived upon making any nontrivial set of taxpayers worse off than proposed and that the agents in that set can overthrow him, appropriate all his resources, and distribute them equally amongst them, which would be a dominant strategy in the case of deviation. This solution is somewhat related to the solution to the malfeasance problem Becker and Stigler (1974) suggest.

17This assumption is without loss of generality with respect to taxation. Assume that the office holder pays the same tax rate as everybody else. Let \(t\) be the tax rate, \(T\) the tax revenue collected from producers, \(g\) the expenditure for enforcement, and \(w\) the wage for the office holder. Then, the balanced budget constraint reads \(w + g = T + tw\) or \((1 - t)w = T - g\). Defining \(\tilde{w} \equiv (1 - t)w\) gives the suggested interpretation. With respect to appropriation, this assumption reflects the perception that office holders’ resources tend to be more secure than generic citizens’ resources.
Stage 1: Selection game  
1.) The set $N$ is drawn.  
2.) The agents in $N$ select $w_L$ and $w_H$.

Stage 2: Political game  
1.) $w_L$ and $w_H$ propose regimes.  
2.) The shock realizes.  
3.) The office holder $w_o$ is elected and enacts his regime.

Stage 3: Competitive equilibrium  
1.) All agents but $w_o$ either produce and pay taxes or don’t.

Table 1: Timeline within the period.

$\varepsilon > 0$ but small probability of a preference shock after the proposals have been announced. If it is realized, then agents’ preferences become lexicographic in the sense that if they are indifferent between the policy regimes proposed, then they care for a somewhat ideologic aspect. Independent of the regime proposed, if a candidate runs for office despite, given his opponent’s proposal, all platforms he could win with, i.e., that make taxpayers at least indifferent between both regimes, give him a strictly lower payoff in office than out of office under the regime his opponent proposed, then voters vote for him rather than randomizing. However, if this condition holds for both agents, then voters randomize. The shock does not affect the nature of equilibrium or show up in any way other than that it selects one from a set of qualitatively identical equilibria so that it can be characterized. For further discussion of the shock and alternative ways of equilibrium selection, see sections 4.1.2 and 4.1.3.

**Timing** The exact timing in the economy is summarized in table 1. In the beginning of the period, the set of potential candidates $N$ is drawn from the population. They decide whether or not to enter the electoral competition to determine two candidates running for office. Then, the two candidates propose regimes and, after the preference shock realizes, the qualified electorate votes over the alternatives presented. The majority winner implements his regime. Thereafter, given the prevailing regime, agents engage in activities of their choice. Producers produce and pay taxes. Then, agents a randomly matched and interact with each other. Here, appropriators try to appropriate resources from producers. Finally, agents consume.

**Assumption 1.** I maintain the following two technical assumptions. Let $\bar{w} \equiv F^{-1}(\frac{1}{2})$ and $\bar{\theta} \equiv \bar{w}(1 - \int_{\bar{w}}^{1} F(w)dw)^{-1}$.

1. The distribution of productivities is unimodal with the mode being greater than or equal to the median and satisfies

$$\left(\int_{\bar{w}}^{1} wf(w)dw\right)^2 \leq \bar{w}^2 f(\bar{w}) \left(1 - \int_{\bar{w}}^{1} F(w)dw\right).$$

2. The cost function $g$ satisfies $-g'(\bar{\theta})\bar{\theta} \leq 1$, i.e., the absolute value of the elasticity of $g$ with respect to $\theta$ evaluated at $\bar{\theta}$ is less than or equal to 1.
3 Analysis

This economy evolves in three stages, the selection game, the political game, and the competitive equilibrium in occupational choice. The equilibrium concept is subgame perfect equilibrium. That is, I require a Nash equilibrium to be played at every stage of the economy.

**Definition 1** (Equilibrium). Given a distribution function \( F \) and a set of potential candidates \( N \), an equilibrium in the economy is a set \( N' \) of potential candidates that chooses to run, a set of office candidates \( \{w_L, w_H\} \), a set of regimes proposed \( \{ (\theta_L, \tau_L), (\theta_H, \tau_H) \} \), probabilities \( P((\theta_L, \tau_L), (\theta_H, \tau_H); w_L, w_H) \) and \( P((\theta_H, \tau_H), (\theta_L, \tau_L); w_H, w_L) \) of winning, an equilibrium regime \( (\theta^*, \tau^*) \), sets \( \Omega \) of producers, \( \Omega^c \) of appropriators, and \( \Xi \) of home producers together, and probabilities \( p \) and \( q \) of meeting appropriators and producers, respectively, such that:

1. \( N' \) is an equilibrium of the selection game and \( \{w_L, w_H\} \) is an equal probability draw from \( N' \) if \( |N'| > 2 \).

2. \( \{ (\theta_L, \tau_L), (\theta_H, \tau_H) \}, P((\theta_L, \tau_L), (\theta_H, \tau_H); w_L, w_H), \) and \( P((\theta_H, \tau_H), (\theta_L, \tau_L); w_H, w_L) \) constitute an equilibrium of the political game given the candidates \( \{w_L, w_H\} \) and \( (\theta^*, \tau^*) \) is the outcome of a random draw from \( \{ (\theta_L, \tau_L), (\theta_H, \tau_H) \} \) with probabilities \( P((\theta_L, \tau_L), (\theta_H, \tau_H); w_L, w_H) \) and \( P((\theta_H, \tau_H), (\theta_L, \tau_L); w_H, w_L) \) attached to \( (\theta_L, \tau_L) \) and \( (\theta_H, \tau_H) \), respectively.

3. The sets \( \Omega \) of producers, \( \Omega^c \) of appropriators, and \( \Xi \) of home producers together with the probabilities \( p \) and \( q \) are a competitive equilibrium in the underlying economy given the regime \( (\theta^*, \tau^*) \).

For generality, this definition contains random draws. In equilibrium, however, everything is deterministic. I solve for the equilibrium by backwards induction. I start by describing the competitive equilibrium given any regime \( (\theta, \tau) \). To be precise, I set up the problem agent \( w \) faces and define the competitive equilibrium including the option of home production. After having stated these, as argued above, this option is ignored for the rest of the analysis. Then, I study the choice of \( (\theta, \tau) \) in the political game given the candidates’ skill levels. Finally, I analyze the selection from potential candidates to candidates. The strategies agents

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18 Notice that assumption 1.1 refers to the ex ante distribution of skills rather than income. Since the ex post income distribution is a truncated version of the skill distribution, the mode either remains unaltered or becomes the lower bound of the support while the median moves to the right. As long as the distribution is logarithmically concave, the mean does so, too. This implies that, despite the above assumption, the mode of the income distribution can be smaller than its median. Example distributions satisfying assumption 2.1 are the uniform distribution on \([0, 1] \) as well as, by way of numerical test, the Normal distribution \( \mathcal{N}(\mu, \sigma) \) on \([0, 1] \) with \( \mu = \frac{1}{2} \) and \( \sigma \leq \frac{1}{2} \).
have available, the payoff functions these map into, and the definition of equilibrium in the respective stage are specified during the process. All proofs can be found in appendix E.

3.1 The underlying economy given $(\theta, \tau)$

In this section, I first describe strategies, payoff functions, and the definition of an equilibrium in the underlying economy. Then, I discuss existence and uniqueness of the equilibrium as well as some comparative statics.

3.1.1 Strategies, payoffs, and equilibrium definition

Given a regime $(\theta, \tau)$, an agent $w \in [0, 1]$ chooses $(\chi^\alpha_w, \chi_w) \in \{0, 1\}^2$. If $w$ chooses $\chi^\alpha_w = 1$, then he produces at home. If $\chi^\alpha_w = 0$, then $w$ chooses his occupation as a producer indicated by $\chi_w = 1$ or as an appropriator indicated by $\chi_w = 0$. An appropriator who is matched with a producer gets a payoff proportional to a draw from the set of productivities of producers net of taxes. That is, given $(\theta, \tau)$, his ex ante expected payoff of being matched with a producer is given by $\int_{w \in \Omega} \theta (1 - \tau)w f(w|w \in \Omega) dw = (1 - \tau) v(\theta)$, where $v : [0, 1] \to [0, 1]$ is given by $v(\theta) = \theta \int_{w \in \Omega} w f(w|w \in \Omega) dw$. Given $\Omega$, $(1 - \tau) v(\theta)$ is the same for all appropriators as it is independent of the appropriator’s productivity. With $p$ and $q$ being the probabilities that a producer meets an appropriator and an appropriator meets a producer, respectively, agent $w$’s expected payoff from being a producer is $pu[(1 - \theta)(1 - \tau)w] + (1 - p)u[(1 - \tau)w] = (1 - \theta p)(1 - \tau)w$. His expected payoff from being an appropriator is given by $q u[(1 - \tau)v(\theta)] + (1 - q)u[0] = q(1 - \tau)v(\theta)$. The outside option of home production yields $\alpha w$ for sure. Agents choose their occupation in order to maximize expected payoff so that the objective function is given by $(1 - \chi^\alpha_w) (\chi_w(1 - \theta p)(1 - \tau)w + (1 - \chi_w)q(1 - \tau)v(\theta)) + \chi^\alpha_w \alpha w$. I assume that an agent that is indifferent between market activity and home production chooses market activity. An agent that is indifferent between appropriation and production chooses appropriation.

**Definition 2** (Competitive equilibrium given $(\theta, \tau)$). Given $(\theta, \tau)$ and a distribution function $F$, a competitive equilibrium in this economy is a distribution of agents, as summarized by the sets of producers, $\Omega$, appropriators, $\Omega^c$, and home producers $\Xi = [0, 1]\setminus(\Omega \cup \Omega^c)$ together with probabilities $p$ and $q$ such that:

1. Given $p$ and $q$, all agents $w \in [0, 1]$ maximize expected payoffs, i.e., $w$’s occupational choice $(\chi^\alpha_w, \chi_w)$ solves

   \[
   \max_{(\chi^\alpha_w, \chi_w) \in \{0, 1\}^2} \{(1 - \chi^\alpha_w) [\chi_w(1 - \theta p)(1 - \tau)w + (1 - \chi_w)q(1 - \tau)v(\theta)] + \chi^\alpha_w \alpha w\},
   \]

   where $v(\theta) = \theta \int_{w \in \Omega} w f(w|w \in \Omega) dw$. 

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2. The “good’s market” clears, i.e.,

\[(1 - \tau) \int_{w \in \Omega} \omega f(w) dw + \int_{w \in \Xi} \alpha w f(w) dw = \int_0^1 c_i dw,\]

where \(c_i\) denotes consumption of agent \(i \in [0, 1]\).

3. The probabilities \(p\) and \(q\) are given by \(p = \omega^c\) and \(q = \omega\) where \(\Xi = \{w \in [0, 1] : \chi^\alpha_w = 1\}\),
\(\Omega = \{w \in [0, 1] : \chi^\alpha_w = 0 \land \chi_w = 1\}\) and \(\Omega^c = \{w \in [0, 1] : \chi^\alpha_w = 0 \land \chi_w = 0\}\).

Notice that, given the setup, the market clearing condition (2) is satisfied automatically since after production and appropriation, no trade is taking place. In particular, appropriation is purely redistributive. Also, the market clearing condition (2) can be written as

\[(1 - \tau) \int_0^1 (1 - \chi^\alpha_w) \chi_w w f(w) dw + \int_0^1 \chi^\alpha_w \alpha w f(w) dw = \int_0^1 c_i dw.\]

3.1.2 Equilibrium of the underlying economy given \((\theta, \tau)\)

In the following, unless stated otherwise, I assume that \(\alpha\) is small enough and impose \(\chi^\alpha_w = 0\) for all \(w \in [0, 1]\). Then, \(\Xi = \emptyset\), \(\Omega = \{w \in [0, 1] : \chi_w = 1\}\), \(\Omega^c = \{w \in [0, 1] : \chi_w = 0\} = [0, 1] \setminus \Omega\), and \(\omega^c = 1 - \omega\). In equilibrium, an appropriator’s payoff is independent of his productivity while a producer’s payoff increases in it. As a consequence, there is a cutoff productivity so that every agent with a lower productivity than that appropriates and everybody else produces.\(^{19}\) Moreover, since \(qv(\theta) \geq 0\), agent 0 always chooses to appropriate and every equilibrium features appropriation. Thus, I can simplify the notation and write \(v(\theta) = \theta \int_{w^*}^1 w f(w) dw = \theta \int_{w^*}^1 \frac{f(w)}{1 - F(w^*)} dw\). It also implies that \(p = F(w^*)\) and \(q = 1 - F(w^*)\). Then, an appropriator’s expected payoff can be written as \(v : [0, 1]^2 \rightarrow [0, 1]\), \(\nu(\theta, \tau) = \theta(1 - \tau) v(\theta) = (1 - \tau) \theta \int_{w^*}^1 w f(w) dw\), while a producer’s expected payoff is given by \((1 - F(w^*)) (1 - \tau) w\).

In any equilibrium, the marginal agent (who is an appropriator) equalizes payoffs from production and appropriation, i.e.,

\[(1 - \theta F(w^*)) w^* = \theta \int_{w^*}^1 w f(w) dw.\]

---

\(^{19}\)Fix \(\theta \in [0, 1]\) and consider any equilibrium. If \(\Omega = \emptyset\) or \(\Omega^c = \emptyset\), then they are intervals trivially. Assume \(\Omega \neq \emptyset\) and \(\Omega^c \neq \emptyset\). Fix agent \(w \in \Omega\). Hence, \((1 - \theta p) w^* \geq (1 - \theta p) w > q v(\theta)\) for all agents \(w' > w\) so that \(w' \in \Omega\). Similarly, fix agent \(w \in \Omega^c\). Hence, \((1 - \theta p) w^* \leq (1 - \theta p) w \leq q v(\theta)\) for all agents \(w' < w\) so that \(w' \in \Omega^c\). Thus, both \(\Omega\) and \(\Omega^c\) are intervals. Since \(qv(\theta)\) is constant while \((1 - \theta p) w\) is continuous and increasing in \(w\), there is \(w^*\) such that \((1 - \theta p) w^* = q v(\theta)\). It follows that, in an equilibrium, there exists a \(w^*\) such that \(w^* \in \Omega^c\) and \(w \in \Omega\) if and only if \(w > w^*\).
Rewriting and integrating by parts yields

\[
\theta^{-1}w^* - 1 + \int_{w^*}^1 F(w)dw = 0. 
\]

Given \( F \), define \( h : [0,1] \times [0,1] \to \mathbb{R} \) where \( h(x; \theta) = \theta^{-1}x - 1 + \int_x^1 F(w)dw \). Since \( F \) is differentiable and thus continuous, \( h \) is continuously differentiable on \((0,1) \times (0,1)\). Let \( w^* : [0,1] \to [0,1] \) denote the solution to (5) as a function of \( \theta \). The following proposition describes the equilibrium.

**Proposition 1** (Competitive equilibrium given \((\theta, \tau)\)). There exists a unique equilibrium for all \( \theta > 0 \). \( w^* \) is \( C^2((0,1)) \), strictly convex, and strictly increasing with \( w^*(0) = 0 \) and \( w^*(1) = 1 \). More unequal economies in the sense of a mean preserving spread of the distribution of market returns have higher cutoff skills. Richer economies in the sense of a first order stochastically dominant distribution of market returns have higher cutoff skills.

Notice that for \( \theta \) high enough, i.e., \( w^*(\theta) \) close enough to one, the home production option becomes relevant. I disregard this here. The last two parts of the proposition say that both more inequality and a favorable productivity distribution (i.e., shifted to the right) lead to a higher cutoff productivity level. However, a higher cutoff value \( w^* \) does not imply more appropriation per se as this depends on how \( F(w^*) \) changes. Figure 1 provides some examples to illustrate these results by comparing similar distributions with respect to mean and variance. In particular, panel 1(a) plots the implied cutoff productivity \( w^*(\theta) \) while panel 1(b) plots the associated measure of appropriators \( F(w^*(\theta)) \). The latter shows that, in richer economies, despite a higher cutoff skill, the measure of appropriators, i.e., the incidence of

![Figure 1: Example functions \( w^*(\theta) \) deriving from different distributions \( F(w) \) in panel 1(a) and example measures of appropriators \( F(w^*(\theta)) \) from different distributions in panel 1(b).](image-url)
appropriation, might be lower than in poorer economies.

To summarize, given \((\theta, \tau)\), the competitive equilibrium can be characterized by the single object \(w^*(\theta)\). For later reference, let \(\bar{w} \equiv F^{-1}(\frac{1}{2})\) be the median (agent’s) productivity in the economy and \(\bar{\theta}\) given by \(w^*(\bar{\theta}) = \bar{w}\), the median enforcement. That is, from (5), \(\bar{\theta} \equiv \bar{w}(1 - \int_{\bar{w}}^1 F(w)dw)^{-1}\) is the choice of \(\theta\) that implies that the cutoff productivity equals the median agent’s productivity. Also, define \(\varphi : [0, 1]^2 \rightarrow [0, 1]\) by \(\varphi(\theta, \tau) = (1 - F(w^*(\theta)))\theta(1 - \tau)\) and recall that \(\nu : [0, 1]^2 \rightarrow [0, 1]\) is given by \(\nu(\theta, \tau) = (1 - \tau)\theta \int_{w^*(\theta)}^1 wf(w)dw\). Finally, the economy’s output given enforcement \(\theta\) is \(\theta = \int_{w^*(\theta)}^1 wf(w)dw\) and the egalitarian welfare measure ignoring the office holder is given by\(^{20}\)

\[
W(\theta, \tau) = \varphi(\theta, \tau) \left(1 - \int_{w^*(\theta)}^1 F(w)dw\right).
\]

### 3.2 The political game given \(w_L\) and \(w_H\)

Again, I first specify the strategies and payoff functions in the political game and provide the equilibrium definition. Then, I analyze the cases of anarchy and dictatorship before describing the equilibrium. If there is need to refer to the office holder, then I use \(w_o\). When I refer to the players of the political game, \(w_L\) and \(w_H\), using indices, then I use \(i\) and \(i\) and \(-i\) to indicate \(i \in \{L, H\}\) and \(-i \in \{L, H\} \setminus \{i\}\). Equivalently, I use the notation \(w_i \in \{w_L, w_H\}\) and \(w_{-i} \in \{w_L, w_H\} \setminus \{w_i\}\).

#### 3.2.1 Strategies, payoffs, and equilibrium definition

By the above analysis, for any agent with skill level \(w'\), given \((\theta, \tau)\), the occupational choice problem implies a value function defined by

\[
V(\theta, \tau; w') \equiv \max \left\{ (1 - \theta F(w^*(\theta))) (1 - \tau)w', \theta(1 - \tau) \int_{w^*(\theta)}^1 wf(w)dw \right\}.
\]

Notice that, given \((\theta, \tau)\), \(w'\)’s occupational choice is independent of the tax rate \(\tau\) as \(V(\theta, \tau; w') = (1 - \tau)V(\theta, 0; w')\) and that \(V(\theta, \tau; w')\) is weakly increasing in \(w'\) and strictly so if \(w' > w^*(\theta)\). Moreover, in general, \(w'\)’s preferences over \((\theta, \tau)\) are not single peaked (see figure 2 below). Facing the set of proposals \(\{((\theta_L, \tau_L), (\theta_H, \tau_H)\}\), every voter \(w'\) evaluates

\(^{20}\)Notice that, in equilibrium,

\[
\int_0^1 V(\theta, \tau; w) f(w)dw = \int_0^{w^*(\theta)} \nu(\theta, \tau) f(w)dw + \int_{w^*(\theta)}^1 \varphi(\theta, \tau) f(w)dw
\]

From here, the statement is obtained by plugging in the equilibrium condition \(\nu(\theta, \tau) = \varphi(\theta, \tau) w^*(\theta)\), factoring out, and integrating by parts.
V(θ_L, τ_L; w') and V(θ_H, τ_H; w') and votes for the regime that provides him with the higher expected payoff. That is, voter w' chooses and announces (χ_{w'}^L, χ_{w'}^H) ∈ \{0,1\}^2 so as to solve

\[(VP) \quad \max_{(χ_{w'}^L, χ_{w'}^H) ∈ \{0,1\}^2} \chi_{w'}^L V(θ_L, τ_L; w') + \chi_{w'}^H V(θ_H, τ_H; w') \quad s.t. \quad \chi_{w'}^L + \chi_{w'}^H = 1.\]

The constraint implies that exactly one of the control variables is chosen to equal one. If he is indifferent, i.e., V(θ_L, τ_L; w') = V(θ_H, τ_H; w'), then w' randomizes with equal probabilities assigned to \{χ_{w'}^L = 1, χ_{w'}^H = 0\} and \{χ_{w'}^L = 0, χ_{w'}^H = 1\}.\(^{21}\) Aggregation of individual votes through majority rule and equal probability randomization in case of a draw implies the following map to the equilibrium regime:

\[(7) \quad (θ^*, τ^*) = \begin{cases} (θ_L, τ_L) & \text{if } f_0^1 χ_{w'}^L f(w) dw > \frac{1}{2}; \\ \text{draw with probability } \frac{1}{2} & \text{if } f_0^1 χ_{w'}^L f(w) dw = \frac{1}{2}; \\ (θ_H, τ_H) & \text{if } f_0^1 χ_{w'}^L f(w) dw < \frac{1}{2}. \end{cases}\]

In the specification and description of the probabilities of winning it is notationally convenient to refer to a regime as σ = (θ, τ). Given the candidates w_i and w_{i-1} and their proposals σ_i = (θ_i, τ_i) and σ_{i-1} = (θ_{i-1}, τ_{i-1}), let \(P(σ_i, σ_{i-1}; w_i, w_{i-1}) = Prob\{w_i wins|w_{i-1}, \{(θ_i, τ_i), (θ_{i-1}, τ_{i-1})\}\}\ be the probability of candidate \(w_i, i \in \{L, H\}\), winning the election given his opponents skill \(w_{i-1}, -i \in \{L, H\} \setminus \{i\}\), and both the regime he proposes and the one proposed by his opponent.

Whenever the proposals are such that the preference shock is neutral, the probabilities of winning are zero, one half, or one if the measure of voters voting for a proposal is less than, equal to, or greater than one half, respectively. In cases in which the shock has bite, the probabilities are close to these values, but, in particular, they are never zero or one. A general formulation of these probabilities can be found in appendix B.1. Given any \((θ, τ) \in [0,1]^2\), a balanced budget implies that an office holder gets \(\tilde{w}: [0,1]^2 \rightarrow R\) defined by

\[(8) \quad \tilde{w}(θ, τ) = τ \int_{w^*(θ)}^1 w f(w) dw - g(θ).\]

I maintain the following assumptions.

**Assumption 2.** Both \(\tilde{w}(θ, τ)\) and \(φ(θ, τ)\) are strictly quasiconcave in \((θ, τ)\). Given τ, both \(\tilde{w}(θ, τ)\) and \(ν(θ, τ)\) are strictly quasiconcave in θ.

In appendix A sufficient conditions for assumption 2 to hold are derived. Appendix D lays out

\(^{21}\)The results remain unaltered if indifferent voters abstain from voting as long as the simple majority of all votes casted is sufficient to win the election. The results might change if voters had a preference over the office holder’s skill. However, in this stylized model, it is not clear why an agent should care for anything else but utility from consumption provided by the policy. I do depart from that to some extent, when selecting an equilibrium in the political game.
a simple economy that satisfies assumptions 1 and 2. I use it to illustrate some results and refer to it as the “example economy.” Figure 2, in panel 2(a), depicts the payoff and value functions for agent $w' = 0.3$ in the example economy when $\tau = 0$. Taxes enter multiplicative so that this does not alter the picture. This example clearly shows that voters’ preferences over regimes are not necessarily single-peaked in even the enforcement dimension alone. Additionally, panel 2(b) depicts the in-office payoff for any $\theta$ and a few tax rates. For later reference, the following optimization problem is stated.

\[
\begin{align*}
\quad \max_{(\theta, \tau) \in [0,1]^2} & \quad \tau \int_{w^*(\theta)}^1 w f(w) dw - g(\theta) \quad \text{s.t.} \quad (1 - F(w^*(\theta)))\theta(1 - \tau) \geq \bar{\varphi},
\end{align*}
\]

or more compactly

\[
\max_{(\theta, \tau) \in [0,1]^2} \bar{w}(\theta, \tau) \quad \text{s.t.} \quad \varphi(\theta, \tau) \geq \bar{\varphi},
\]

where $\bar{\varphi} \in [0,1)$ is some nonnegative constant. By assumption 2, problem (P) has a unique solution for any $\bar{\varphi} \in [0,1)$ (see lemma 2 in appendix E).

Now, agent $w_i$, $i \in \{L, H\}$, faces the problem of proposing a regime $(\theta_i, \tau_i)$ so as to maximize his expected payoff given the regime $(\theta_{-i}, \tau_{-i})$ proposed by agent $w_{-i}$, $-i \in \{L, H\} \backslash \{i\}$. That is, he solves the problem

\[
\begin{align*}
\quad \max_{(\theta_i, \tau_i) \in [0,1]^2} & \quad P(\sigma_i, \sigma_{-i}; w_i, w_{-i})\bar{w}(\theta_i, \tau_i) + (1 - P(\sigma_i, \sigma_{-i}; w_i, w_{-i}))V(\theta_{-i}, \tau_{-i}; w_i) \quad \text{s.t.} \quad \varphi(\theta_i, \tau_i) \geq \bar{\varphi},
\end{align*}
\]

The objective function is given by the sum of the in-office payoff the regime he proposes
implies in the case of winning the election weighted by the probability of winning and the payoff as a citizen under the regime proposed by his opponent in case he loses the election weighted by the probability of losing.

**Definition 3** (Equilibrium in the political game given $w_L$ and $w_H$). Given $\{w_L, w_H\}$ and a distribution function $F$, an equilibrium in the political game is a set of proposals $\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}$ and probabilities $P(\sigma_L, \sigma_H; w_L, w_H)$ and $P(\sigma_H, \sigma_L; w_H, w_L)$ of winning such that:

1. Given $(\theta_{-i}, \tau_{-i})$, $-i \in \{L, H\} \setminus \{i\}$, and the function defined in (18), for all agents $i \in \{L, H\}$, $(\theta_i, \tau_i)$ solves problem (PP).

2. $P(\sigma_L, \sigma_H; w_L, w_H)$ and $P(\sigma_H, \sigma_L; w_H, w_L)$ are determined by (18).

Notice that the function (18) (see appendix B.1) implies optimization on the part of the voters. Voters and voting simply determine the map from regimes proposed to payoffs received. The actual political game is played between agents $w_L$ and $w_H$ when proposing regimes.

### 3.2.2 Equilibrium of the political game given $w_L$ and $w_H$

There are two aspects to the analysis of the political game. One is the determination of the probabilities of winning the election as functions of the set of proposals. The other one is the strategic interaction of the candidates given these probability maps.

For a characterization of the probabilities of winning, it is necessary to study the voters' behavior. In this economy, a median voter result obtains. While the statement of this intermediate result can be found in appendix E, I summarize its implications here. It says that, if the median voter strictly prefers one proposal over the other, then more than half of the population does so and this proposal wins the election. If the median voter is indifferent and the platforms place enforcement on opposite sides of the median enforcement $\bar{\theta}$, then the voting body is perfectly divided and the election ties. In both these cases, the preference shock is irrelevant since for it to matter, at least one half of the population has to be indifferent.

If the shock is neutral and the proposals make the median voter indifferent, then pooling proposals wins the election for each candidate with a probability of one half while proposing enforcement closer to the median enforcement wins the election for sure. If the shock is not neutral, then voters solve problem (VP) to determine the voting behavior. In equilibrium, the voting behavior satisfies the requirement of a Nash equilibrium in the voting subgame with the exclusion of weakly dominated strategies (see, e.g., Besley and Coate (1997) for this equilibrium concept applied to a model with a finite number of voters). For any agent, not voting for the maximal argument is only optimal (by indifference) given all others’ actions, if the equilibrium profile is such that it does not matter for the outcome what this agent’s vote is. (In fact, a measure zero agent is never pivotal.) However, it is certainly suboptimal for some conceivable profiles and thus weakly dominated.
neutral, then it alters the probabilities of winning. Pooling proposals favors one candidate by assigning a slightly higher probability while proposing enforcement closer to the median enforcement does not win the election for sure anymore. Using this result, I provide an exact characterization of the probability of agent \(i\) winning the election given he proposes \((\theta_i, \tau_i)\) while his opponent proposes \((\theta_{-i}, \tau_{-i})\) in appendix B.2.

When playing the political game, the candidates take this probability map as given in their strategic interaction. A few general observations about problem (PP) follow. Consider any candidate. First, given his opponent’s proposal, if he can propose a regime that wins him the election and makes him better off in office than he would be out of office under his opponent’s regime, then he proposes that regime. On the other hand, if all regimes that would win him the election made him worse off than out of office under his opponent’s regime, then he proposes a regime that loses the election. Moreover, if that candidate has a positive probability of winning the election, he better be at least as well off in office implementing his regime as he would be out of office under his opponent’s regime. Similarly, if he loses for sure, then he should not be able to propose a regime that wins the election and makes him better off in office than he would be out of office. The following proposition is one of the main results and characterizes the equilibrium in the political game. I explain its predictions after I state it.

**Proposition 2** (Political game equilibrium given \(w_L\) and \(w_H\)). Given \(w_L\) and \(w_H\), an equilibrium exists. There is a \(w_p < \bar{w}\) such that, whenever \(w_H \leq w_p\), then the winning (and implemented) regime \((\theta^*, \tau^*)\) in any equilibrium of the political game, irrespective of whether it is pooling or separating, satisfies \((\theta^*, \tau^*) = (\theta_p, \tau_p)\), \(\theta_p < \bar{\theta}\), where \((\theta_p, \tau_p)\) is the unique pooling equilibrium independent of both \(w_L\) and \(w_H\) and solves the system

\[
\Psi_1(\theta) = \Psi_2(\theta)
\]

\[
\tau_p(\theta_p) = \frac{\theta_p \int_{w^*(\theta_p)}^{1} w f(w) dw + g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta_p)}^{1} w f(w) dw}
\]

where \(\Psi_1(\theta)\) and \(\Psi_2(\theta)\) are given by

\[
\Psi_1(\theta) = \int_{w^*(\theta)}^{1} w f(w) dw - g(\theta), \quad \Psi_2(\theta) = \frac{[-w^*(\theta) f(w^*(\theta)) w^{**}(\theta) - g'(\theta)] \int_{w^*(\theta)}^{1} w f(w) dw}{(1 + \theta)^{-1} \theta^{-1} w^*(\theta) F(w^*(\theta))}.
\]

If \(w_H > w_p\), then a pooling equilibrium does not exist and, in any separating equilibrium of the political game, the set of proposals \(\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}\) is such that \(w_L\) proposes worse enforcement, \(\theta_L > \theta_H\), \(w_L\) wins the election with probability 1, i.e., \((\theta^*, \tau^*) = (\theta_L, \tau_L)\), the median voter \(\bar{w}\) produces in equilibrium, i.e., \(\theta^* = \bar{\theta} < \theta\), and is indifferent between the proposed regimes, i.e., \(V(\theta_L, \tau_L; \bar{w}) = V(\theta_H, \tau_H; \bar{w})\), and \(w_L\) gets \(w_H\)’s out-of-office payoff,
i.e., $\bar{w}(\theta_L, \tau_L) = V(\theta_L, \tau_L; w_H)$. Moreover, $\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}$ satisfies

\begin{align}
\psi_1(\theta_L; w_H) &= \psi_2(\theta_L; w_H) \\
\tau_L &= \frac{(1 - F(w^*(\theta_L))\theta_L)w_H + g(\theta_L)}{\theta_L} \\
\varphi_H &= (1 - F(w^*(\theta_L))\theta_L)(1 - \tau_L) \\
(\theta_H, \tau_H) &\in T_H(\theta_L, \varphi_H),
\end{align}

where $T_H(\theta_L, \varphi_H) = \{(\theta, \tau) \in [0,1]^2 : (1 - F(w^*(\theta))\theta)(1 - \tau) = \varphi_H \text{ and } \theta < \theta_L\}$ and $\psi_1(\theta; w_H)$ and $\psi_2(\theta; w_H)$ are given by

\begin{align}
\psi_1(\theta; w_H) &= \int_{w^*(\theta)}^{1} w f(w) dw - g(\theta) \\
\psi_2(\theta; w_H) &= \frac{(-w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta)) \left(\int_{w^*(\theta)}^{1} w f(w) dw + (1 - F(w^*(\theta))\theta)w_H\right)}{\theta - w^*(\theta)F(w^*(\theta))}.
\end{align}

The winning (and implemented) regime $(\theta^*, \tau^*) = (\theta_L, \tau_L)$ is unique. Finally, $w_p = w^*(\theta_p)$.

Given $(\theta_L, \tau_L)$, and thus $\varphi_H$, any proposal $(\theta_H, \tau_H) \in T_H(\theta_L, \varphi_H)$ is a best response. Hence, any distribution over any subset of $T_H(\theta_L, \varphi_H)$ would do. This implies that the losing proposal is indeterminate. However, the winning proposal which is the single relevant object is unique.

This proposition contains a couple of results. First, there is a $\theta_p \in (0, \tilde{\theta})$ such that there is no pooling equilibrium if $w_H > w^*(\theta_p) \equiv w_p$. Moreover, if a pooling equilibrium exists, then it is unique and the quality of the institutions implemented is independent of both $w_L$ and $w_H$. This result derives from the requirement that, in a pooling equilibrium, both agents have to be indifferent between the same in-office payoff and their out-of-office payoffs. Thus, both agents have to be appropriators if they don’t get into office, implying that their productivities do not affect their out-of-office payoffs and, hence, do not matter for the outcome. It follows that there is a unique outcome $(\theta_p, \tau_p)$ prevailing in pooling equilibria, irrespectively of the candidates’ skills. Therefore, this equilibrium cannot arise if $w_H > w^*(\theta_p)$. This last observation implies that pooling equilibria could be ruled out by simply assuming that $w_H \geq w_p$, which is completely determined by the distribution and the technology, i.e., fundamentals.

Second, the outcome of any separating equilibrium with $w_H \leq w^*(\theta^*)$, irrespective of who wins the election, looks like the outcome of a pooling equilibrium, i.e., $\theta^* = \theta_p$. The reason is that the associated out-of-office payoff for either agent is an appropriator’s payoff which is independent of their skills. That last aspect implies the same as in the discussion of pooling equilibria. Third, there is no separating equilibrium in which $w_H$, proposing any regime $(\theta_H, \tau_H)$, wins the election with probability one and $w_H > w^*(\theta_H)$. The intuition is that $w_H$
would prefer to stay out of office in this case since his in-office payoff is constrained by his opponent’s out-of-office payoff who has a lower skill level. So, again, if \( w_H \geq w_p \), then \( H \) never wins in a separating equilibrium. These observations imply that, without loss of generality, I can assume for the rest of the analysis that all equilibria are separating, \( w_L \) always wins the election with probability one, and, in the case where \( w_H \leq w^* (\theta_p) \), \( w_L \) wins the election with the regime \((\theta_p, \tau_p)\). The intuition is that \( w_L \)'s outside option is worse than \( w_H \)'s so that he is satisfied with an in-office payoff that would be too low for the higher skill candidate to be willing to serve in office.

The fact that, in equilibrium, the median voter is both indifferent between proposals and a producer under either regime implies that the agents that are appropriators under at least one of the regimes are the decisive voters in the election. Since a producer’s payoff is a linear function of his productivity, all agents that would be producers under either regime are indifferent between proposals. Therefore, the proposal that offers a higher payoff to appropriators wins the election. That is, agents that are appropriators under at least one regime prefer that very regime because it provides an expected payoff that is independent of their rather low productivity. But then this regime will also be preferred by agents that prefer to appropriate under either regime since it provides a higher appropriation payoff. An intuitively appealing interpretation of this prediction is that agents that end up living off appropriation activities are an obstacle to implementing better institutions and thus outcomes.

Further, while the loser’s proposal simply provides the voting body with an alternative, there is a second channel through which he constrains the extraction of resources the office holder can implement. His outside option constrains the winner to-be’s discretion. The lower the out-of-office payoff the winner to-be offers the loser to-be, the stronger the loser to-be’s incentive to get into office. In fact, the outcome solely depends on the loser’s skill who thus determines (dictates) the equilibrium regime. This is one of the main results. It implies that two economies with the same productivity distribution and the same office holder can have different regimes implemented since the runner-up in the election differs leading to different choice sets the respective electorates face.

The reason why the preference shock helps in the political game is that the election winner can only be sure to win if he proposes a regime that makes the loser’s out-of-office payoff less than or equal to the maximum attainable in-office payoff when winning. At the same time, equilibrium requires that the loser’s out-of-office payoff be greater than or equal to the winner’s in-office payoff. Since the loser’s maximum attainable in-office payoff when winning is also attainable for the winner, the winner gets that payoff which is then to be equalized with the loser’s out-of-office payoff. This way, agents basically coordinate on an equilibrium. If the announcement of proposals were made sequentially, then there exists a unique equilibrium.
outcome (in terms of the implemented regime) for $\varepsilon = 0$. The reason is that sequentiality pins down the first mover’s belief of his opponent’s play to be the best response to his proposal. A possible interpretation of this timing assumption is that there is an incumbent office holder that has a first mover advantage. This can be due to having established a policy platform during the last period, exerting control over the media (e.g., in dictatorial-like societies), or the fact that while the selection into political competition is going on, the incumbent can prepare for the competition against the expected opponent. As a consequence, if an incumbent has a first mover advantage, then as long as he stays in office, the loser’s skill determines the outcome and can lead to either improvements or deterioration of property rights. In case he loses the election he forces the new office holder to be indifferent between being in office and out of office. So, the new office holder’s skill determines the outcome at this point. In general, a change in office improves property rights initially. For further discussion, see section 4.1.3.

### 3.2.3 Comparative statics of the political game

The productivity of only one agent, the election’s runner-up, appears in the equations determining the equilibrium schedules. Let $\theta^*$ and $\tau^*$ denote the equilibrium institutions and tax that imply the equilibrium payoff factor $\varphi^*$ for producers.

**Proposition 3** (Political game comparative statics). Enforcement, output, welfare, taxpayers’, appropriators’, and the office holder’s payoff are continuous functions of $w_H$ and differentiable with respect to $w_H$ for all $w_H \neq w_p$. If $w_H > w_p$, then enforcement worsens with $w_H$, output, welfare, and both taxpayers’ and appropriators’ payoffs decrease in $w_H$, and the office holder’s payoff increases in $w_H$. If $w_H \leq w_p$, then all these measures are constant in $w_H$.

Figure 3 illustrates these comparative statics results for the example economy. Abusing notation, variables of interest are plotted as functions of $w_H$. The enforcement and cutoff variables as well as output in panel 3(a) are rather flat. (However, output does decrease.) This characteristic seems to derive from the fact that both the cost function and the distribution (which is uniform) are rather flat for most or all of their respective domain.

The intuition is that an agent with a higher skill has a better outside option under any regime than an agent with a lower skill. It requires a higher in-office compensation for him to be indifferent between holding office and not holding office. Facing an agent that asks a high in-office payoff allows the agent who eventually wins the election to also ask a higher in-office payoff himself and still win than in a case where he is facing an agent that would require a rather low payoff to hold office. Looking at it from the other side, a worse outside option for the loser requires a lower in-office compensation to make him indifferent. So, the winner-to-be faces a tighter constraint on his discretion (i.e., the extraction of resources through both high
3.3 The selection game given $N$

I start by specifying strategies, payoffs, and the definition of equilibrium in the selection game before analyzing the latter. Some additional notation is needed.

3.3.1 Strategies, payoffs, and equilibrium definition

Consider the ordered set $N = \{w_1, \ldots, w_n\}$ and let $J = \{1, \ldots, n\}$. That is, $N$ is the set of all agents that get to play the selection game. For any $j \in J$, let $N_j = N \setminus \{w_j\}$ be the set of all agents other than $w_j$ that play the game. Each agent $w_j \in N$ chooses $\chi_j^s \in \{0, 1\}$, where $\chi_j^s = 1$ means to select into running (if allowed to in the case were a random draw decides who gets to run). A strategy profile for $N$ is given by $\{\chi_j^s\}_{j \in J}$, a profile for $N_k$ is given by $\{\chi_j^s\}_{j \in J \setminus \{k\}}$. Any such strategy profile can be characterized by the set $N' = \{w_j \in N : \chi_j^s = 1\}$ and $N'_k = \{w_j \in N_k : \chi_j^s = 1\}$ collecting the agents that selected to run. Let $n'_k = |N'_k|$.

Figure 3: Comparative statics for the example economy.

taxes and low enforcement expenditure he can implement) and thus his payoff which leads to a favorable set of alternatives the electorate can choose from. Through this channel, as well as the fact that the loser’s proposed regime provides the voters with an alternative, the loser constrains the winner. Importantly, these effects work through the regimes proposed and have general equilibrium effects on, e.g., the tax receipts, through the incentive structure in the underlying economy. Therefore, the lower the skill of the loser, the better the enforcement implemented until it levels off at $\theta_p$ when the loser’s skill falls below $w_p$. As a consequence, output and welfare are higher. Finally, the office holder’s payoff, both in absolute terms and relative to output, increases with $w_H$. 22
Fixing \( j \in J \), for all \( w' \in N'_j \), define \( x_j(w') = |\{w \in N'_j : w < w'\}| \) to be the number of agents in \( N'_j \) that would win the election against \( w' \) if the combination \( \{w, w'\} \) were selected to run for office.\(^{23}\) Finally, let \((\theta(w'), \tau(w'))\) be the respective regime in the case when \( \{w, w'\} \) compete for office and \( w' \) determines the outcome. Let \( I_{\{a>b\}} \) and \( I_{\{a=b\}} \) be the indicator functions that equal 1 whenever the expression in brackets is true and 0 otherwise.

Recall that, if \( N' \) is a singleton, then that agent becomes a dictator, if \( N' \) is empty, then the anarchy regime \((\theta, \tau) = (1,0)\) is adopted. Appendix C analyses the cases of anarchy and dictatorship. In both cases there exists a unique outcome and I denote the value functions (expected payoffs) of an agent with skill \( w \) in the anarchy regime and in a dictatorship by \( V^a(w) \) and \( V^d(w) \), respectively, and a dictator’s payoff in office by \( \tilde{\omega}^d \). Since home production provides for a lower bound on payoffs, the equilibrium expected payoff of all agents (but a possible dictator) under either regime is smaller than or equal to \( \alpha \). A dictator’s payoff \( \tilde{\omega}^d \) is weakly decreasing in \( \alpha \). The following assumption makes precise what “\( \alpha \) small enough” means.

**Assumption 3.** Assume that \( \tilde{\omega}^d = \tilde{\omega}^d(\alpha) > \alpha \). Let \((\tilde{\theta}, \tilde{\tau}, \tilde{\phi})\) be the outcome of the political game when \( w_H = 1 \). Assume that \( \tilde{\phi} w_p > \alpha \).

Notice that both the dictator’s payoff \( \tilde{\omega}^d \) and the pooling equilibrium cutoff productivity \( w_p \) are independent of \( w_L \) and \( w_H \) and completely determined by fundamentals, i.e., the distribution function \( F \), the technology \( g \), and the outside option value \( \alpha \).\(^{24}\) Given the results of section 3.2.3, the taxpayers’ and appropriators’ payoffs decrease in \( w_H \). That is, \( \tilde{\phi} \) is the smallest producer payoff coefficient the political game can generate. Moreover, \( w_p \) is the smallest marginal agent. Thus, any agent in any equilibrium of the political game, always gets at least \( \tilde{\phi} w_p \). For all \( w_H \leq 1 \), \( \phi^* \geq \tilde{\phi} \) so that \( \phi^* w \geq \tilde{\phi} w > \tilde{\phi} w_p \), if \( w > \phi^*(\theta^*) \geq w_p \). If \( w \leq \phi^*(\theta^*) \), then the appropriators’ payoff equals \( \nu(\theta^*, \tau^*) = \phi^* w' \geq \tilde{\phi} w_p \).

Now, consider any agent \( w_j \in N \). If \( n'_j = 0 \), then not running implies \((\theta, \tau) = (1,0)\) and the payoff \( V^a(w_j) \) as derived in section C.1. Running means to become the dictator yielding payoff \( \tilde{\omega}^d \). That is, the objective function is given by

\[
(1 - \chi^s_j) V^a(w_j) + \chi^s_j \tilde{\omega}^d.
\]

If \( n'_j = 1 \), then not running implies dictatorship by somebody else and thus yields \( V^d(w_j) \). If \( w_j \) decides to run, then he receives \( V(\theta(w'), \tau(w'); w') \) whenever he wins, i.e., \( w_j < w' \), while

\(^{23}\)This wording is correct since proposition 2 allows us to disregard pooling equilibria and assume that all equilibria are separating and \( w_L \) wins the election. In any case, \( x \) is used to determine the probabilities of outcomes not winners.

\(^{24}\)This statement is true due to the assumption that the technology is independent of the office holder’s skill. If this assumption were dropped, then the dictator’s payoff depends on the dictator’s skill and a pooling equilibrium might not even exist.
he gets $V(\theta(w_j), \tau(w_j); w_j)$ if he loses. The objective function is

$$(1 - \chi^s_j) V^d(w_j) + \chi^s_j \left( \mathbb{I}_{\{w_j < w'\}} V(\theta(w'), \tau(w'); w') + \mathbb{I}_{\{w_j > w'\}} V(\theta(w_j), \tau(w_j); w_j) \right).$$

Finally, suppose that $n'_j > 1$. The probability of any particular combination of agents in $N'_j$ to be selected to compete for office is given by $\frac{2}{n'_j(n'_j - 1)}$. The number of combinations $\{w, w'\}$, $w, w' \in N'_j$, where $(\theta(w'), \tau(w'))$ is the (implemented) equilibrium outcome of the political game is $x_j(w')$. Therefore, the probability of a particular schedule $(\theta(w'), \tau(w'))$ to be implemented is $\frac{2 x_j(w')}{n'_j(n'_j - 1)}$. Thus, the payoff from not running is

$$\sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j - 1)} V(\theta(w'), \tau(w'); w_j).$$

If $w_j$ decides to select himself into the running, then all previously possible combinations are still possible but arise with the lower probability of $\frac{2}{n'_j(n'_j + 1)}$. When $w_j$ gets to run for office facing some $w' \in N'_j$, then he wins whenever $w_j < w'$ getting $V(\theta(w'), \tau(w'); w')$ and loses when $w_j > w'$ getting $V(\theta(w_j), \tau(w_j); w_j)$. So, his expected payoff from running is $\sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j + 1)} V(\theta(w'), \tau(w'); w_j) + \sum_{w' \in N'_j \cap w < w'} \frac{2}{n'_j(n'_j + 1)} V(\theta(w_j), \tau(w_j); w_j).$ Thus, the objective function is given by

$$(1 - \chi^s_j) \sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j - 1)} V(\theta(w'), \tau(w'); w_j) + \chi^s_j \left( \sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j + 1)} V(\theta(w'), \tau(w'); w_j) \right) + \sum_{w' \in N'_j \cap w < w'} \frac{2}{n'_j(n'_j + 1)} V(\theta(w_j), \tau(w_j); w_j).$$

Combining these, agent $w_j \in N$, given $N'_j$, faces the problem

(SP)

$$\max_{\chi^s_j \in \{0, 1\}} (1 - \chi^s_j) \left( \mathbb{I}_{\{n'_j = 0\}} V^a(w_j) + \mathbb{I}_{\{n'_j = 1\}} V^d(w_j) + \mathbb{I}_{\{n'_j > 1\}} \sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j - 1)} V(\theta(w'), \tau(w'); w_j) \right)$$

$$+ \chi^s_j \left( \mathbb{I}_{\{n'_j = 0\}} \bar{w}^d + (1 - \mathbb{I}_{\{n'_j = 0\}}) \left( \sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j + 1)} V(\theta(w'), \tau(w'); w_j) \right) \right) + \sum_{w' \in N'_j \cap w < w'} \frac{2}{n'_j(n'_j + 1)} V(\theta(w'), \tau(w'); w_j) + \sum_{w' \in N'_j \cap w > w'} \frac{2}{n'_j(n'_j + 1)} V(\theta(w_j), \tau(w_j); w_j).$$

\[25\text{It can be verified that } \frac{2 x_j(w')}{n'_j(n'_j - 1)} \leq 1 \text{ and } \sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j - 1)} \frac{2}{n'_j(n'_j + 1)} = \frac{2}{n'_j(n'_j + 1)} \sum_{w' \in N'_j} x_j(w') = 1.\]

\[26\text{Again, } \sum_{w' \in N'_j} \frac{2 x_j(w')}{n'_j(n'_j + 1)} + \sum_{w' \in N'_j} \frac{2}{n'_j(n'_j + 1)} = \frac{2}{n'_j(n'_j + 1)} \sum_{w' \in N'_j} (x_j(w') + 1) = 1.\]
An equilibrium in the selection game is defined as follows.

**Definition 4** (Selection game equilibrium given \(N\)). Given the distribution function \(F\) and the set \(N\) of agents, an equilibrium of the selection game is a set \(N'\), or, equivalently, a strategy profile \(\{\chi_j^s\}_{j \in J}\), such that for each agent \(w_j \in N = N\), given \(N'_j\), \(\chi_j^s\) solves (SP).

Having specified strategies, payoffs and the equilibrium definitions, I can prove the following result.

### 3.3.2 Equilibrium of the selection game given \(N\)

**Proposition 4** (Selection game equilibrium given \(N\)). Given the distribution function \(F\) and the set \(N\), assume that assumption 3 holds. If \(|N| \leq 2\), then there is a unique equilibrium and \(N' = N\). Suppose that \(|N| > 2\). If \(|N \cap [0,w_p]| \leq 2\), then there is a unique equilibrium and \(N' = \{w_1, w_2\}\), i.e., \(w_2\) determines the equilibrium regime. If \(|N \cap [0,w_p]| > 2\), then a profile \(N'\) is an equilibrium if and only if it is a subset selected from \(N \cap [0,w_p]\) and all equilibria imply the regime \((\theta^*, \tau^*) = (\theta_p, \tau_p)\).

Generally, the assumption \(N \cap (w_p, 1] \neq \emptyset\) makes the problem interesting in the first place (recall section 3.2.3). Under the assumption that \(N \subset [w_p, 1]\), the equilibrium is unique.\(^{27}\) Only \(w_1\) and \(w_2\) have a dominant strategy as long as at most the dominated strategy of the other one of the two is removed. However, if there had been other Nash equilibria, then, since proposition 3 implies that \(V(\theta(w'), \tau(w'); w) = \max\{v(\theta(w'), \tau(w')), \varphi(\theta(w'), \tau(w'))w\}\) decreases weakly in \(w'\), the ones analyzed here are (weakly) payoff dominant.

For the intuition, I focus on the case where \(N \subset [w_p, 1]\). Due to the strategic interaction in the political game, low skilled agents can increase their otherwise low payoff by running for office. If \(w_1\) decides not to run, then he receives his expected out-of-office payoff under the regime implemented. If he chooses to run, then he has positive probability of competing for office. If he gets to compete, then he wins for sure and receives an in-office payoff equal to the expected out-of-office payoff of the loser of the election. Independent of who the loser is, \(w_1\) is always better off winning against him and getting the associated payoff than not running and getting his own out-of-office payoff under the regime implied by the loser’s skill when he loses against somebody else. (In the more general case, it is only weakly dominant in the sense that the payoff of \(w_1\) and the loser could be equal under the implied regime.) However, given any \(N'_1 \subseteq N_1\), \(w_1\) weakly increases his expected payoff by choosing to run since the probability of getting into office is strictly positive. Thus, \(w_1\) runs. Given that \(w_1\) runs, for

\(^{27}\)In the example economy, \(w_p < 0.2\) so that more than 80% of the agents in the economy could be selected into the set \(N\).
$w_2$, running is a dominant strategy. (In fact, it is so even if $w_1$ does not run as, in this case, his considerations parallel the ones of $w_1$.) If $w_2$ where to compete for office, then he would lose for sure and receive the highest possible expected payoff. Independent of who else chooses to run, doing so implies a positive probability of competing for office. Given that $w_1$ and $w_2$ run, the dominant strategy for all other agents is to refrain from running for the reason that this implies that $w_2$ competes with $w_1$ thereby maximizing all other agents’ expected payoff.

Without loss of generality, I conclude that only $w_2$ matters for the outcome. If $|N \cap [0, w_p]| \leq 2$, then $w_2$ determines the regime and if $w_2 \leq w_p$, then $(\theta^*, \tau^*) = (\theta_p, \tau_p)$. If $|N \cap [0, w_p]| > 2$, then $w_2 < w_p$ and, again, the outcome is $(\theta_p, \tau_p)$. That is, $w_2$ summarizes all relevant information.

### 3.4 Constraints to participation

Since an equilibrium with a unique outcome exists at each stage, there also exists a full equilibrium with a unique outcome. In the following, I analyze some comparative statics with respect to the underlying political institutions and ask what effect constraints to participation and their relaxation have on an economy’s outcome. First, I consider restrictions on participation in political competition, i.e., on who can potentially propose regimes. Then, I ask how constraints to participation in the voting body, i.e., who decides or votes, affect the outcome.

#### 3.4.1 Access to political competition

By the above analysis, the equilibrium outcome of this society depends only on the skill of the agent $w_2$. Using this insight, I analyze the effects of constrained participation in this dimension. I assume that there is a $w \in [0, 1]$ such that only agents with $w \geq w$ can be drawn into $N$. That is, $w$ represents something like a minimum skill requirement for running for office.\(^{28}\) The parameters $n$ and $w$ can be thought of as determining constraints on participation in political competition. Let the probability of being selected into the set $N$ associated with $w$ be represented by the cumulative distribution function $\Gamma(z)$ with continuous density $\gamma(z)$ and support $[w, 1]$. The random draw of the set $N$ is a simple model of how a society’s endowment with potential candidates comes about.\(^{29}\) Further, I assume that for any $w' > w$,

\(^{28}\)This requirement does not need to be institutional. Suppose that the marginal productivity is a function of how well connected an agent is with elite groups.

\(^{29}\)The assumption that this selection is random is justified by a lack of a better model. As an alternative, suppose that a society’s set of potential candidates is drawn by the following deterministic rule. The ordered set $N$ collects $n$ agents with a minimum skill $w_1$ and a maximum skill $w_n$ in such a way that the distance between two successive agents’ productivity, $w_{j+1} - w_j$, is equal for all $j = 1, \ldots, n - 1$, i.e., $N = \{w_1, w_1 + \frac{w_n - w_1}{n-1}, w_1 + 2\frac{w_n - w_1}{n-1}, \ldots, w_1 + (n - 2)\frac{w_n - w_1}{n-1}, w_n\}$. With this rule, $w = w_1$ corresponds to the minimum skill requirement, $n$ is the same as before, and, fixing $w_1$, decreasing $w_n$ increases the weight on lower skilled agents as a first order stochastically dominated distribution would do. For this particular model of the selection process, the results hold exactly as reported but in a deterministic rather than probabilistic sense. Moreover,
the associated distribution function $\Gamma'(z)$ is a truncation of $\Gamma(z)$. Proposition 5 shows how access to political competition affects the outcome prevailing in the described society.

**Proposition 5** (Access to political competition). *Anything that increases the second order statistic of the draws of potential candidates increases the likelihood of better outcomes. In particular, the more agents are drawn to select to enter political competition, i.e., the larger $n = |N|$, and the less restrictive the skill requirements are, i.e., the smaller $w$, the more likely are better institutions and higher welfare. Moreover, let $\Gamma'$ first order stochastically dominate $\Gamma$. Then, better institutions and higher welfare are more likely under $\Gamma$.*

This result concerns openness of political competition to a large number of agents facing mild constraints. I model them simply as the number of potential candidates drawn, a minimum skill requirement as well as the mass of rather low skilled agents that can potentially compete for office. It says that a society in which entering activities in the political arena is less restricted is likely to provide for both better institutions and higher welfare. Given that low skilled agents competing for office limit the office holder’s discretion, politically more open societies are likely to impose tighter bounds. The reason is that the probability of the winner to-be facing a rather low-skilled opponent who imposes tighter constraints on his discretion (i.e., the second order statistic of the draws from the population) and, thus, the likelihood of better outcomes increases. However, easier access to political competition does not imply better outcomes.

### 3.4.2 Qualified electorate or elites

North et al. (2007) distinguish between a country’s population and its citizens. Only the latter have access to economic and political activities and organizations which creates rents. They form an elite. Similarly, elites feature prominently in the literature (see, e.g., Acemoglu (2006b)). In the present model the distinction amounts to voters versus non-voters (and, potentially, candidates need to be voters). In addition, an important point about elites is that the agents belonging to it are well-connected. This is likely to be associated with higher returns to market activities. Thus, in the following analysis, I assume that the median agent in the elite group, $\bar{w}^e$, has a weakly higher productivity than the median agent in the whole population $\bar{w}$, i.e., $\bar{w}^e \geq \bar{w}$.

Let $E$ be the elite, the set of agents that are allowed to vote. Let $\chi_e \in \{0, 1\}$ be an indicator of an agent belonging to the elite or not, where $\chi_e = 1$ indicates membership. Let $f_{w\chi_e}: [0, 1] \times \{0, 1\} \rightarrow \mathbb{R}_+$, $f_{w\chi_e}(z, \chi) = P(\chi_e = \chi | w = z) f_w(z)$ be the continuous density function.
with differentiable marginal \( f_w \). \( P(\chi_e = 1|w = z) \) is the probability that an agent with productivity \( z \) belongs to the elite. Then, the assumption employed in the analysis so far is that \( P(\chi_e = 1|w = z) = 1 \) for all \( z \in [0, 1] \). In the following, I assume that \( P(\chi_e = 1|w = z) \in (0, 1) \) for all \( z \in [0, 1] \) so that, potentially, the elite is a strict subset of the population with full support in the productivity dimension, i.e., \( f_{w\chi_e}(z, 1) \) has full support.\(^{30}\) To simplify the analysis below, let \( m_e = \int_0^1 f_{w\chi_e}(z, 1)dz \) and define \( F_e(x) = m_e^{-1} \int_0^x f_{w\chi_e}(z, 1)dz \) as an auxiliary cumulative distribution function for the elite. The median skill of the elite is defined as satisfying \( F_e(\tilde{w}^e) = \frac{1}{2} \).\(^{31}\) The regimes proposed are mapped into probabilities of winning that are defined analoguously to (18). Note that the universe the sets \( \mathcal{I}, \mathcal{I}^+ \), and \( \mathcal{I}^- \) live in remains unchanged due to the assumption that the elite \( E \) has full support. However, the distribution function used in defining \( \mathcal{M}_e, \mathcal{M}_e^+, \) and \( \mathcal{M}_e^- \) is \( F_e \). The map implied by optimal voting behavior in the elite is given by

\[
(\theta^*, \tau^*) = \begin{cases} 
(\theta_L, \tau_L) & \text{if } m_e^{-1} \int_0^1 \chi_w f_{w\chi_e}(w, 1)dw > \frac{1}{2}, \\
\text{draw with probability } \frac{1}{2} & \text{if } m_e^{-1} \int_0^1 \chi_w f_{w\chi_e}(w, 1)dw = \frac{1}{2}, \\
(\theta_H, \tau_H) & \text{if } m_e^{-1} \int_0^1 \chi_w f_{w\chi_e}(w, 1)dw < \frac{1}{2}.
\end{cases}
\]

**Proposition 6 (Qualified electorate or elites).** Fix the set \( N \) of agents that can select themselves into running for office. Any elite set that is consistent with the above description produces the same outcome as the situation where the voting body is constituted by the whole population.

This result says that, whenever the qualified electorate is such that an equilibrium exists, then the outcome is the same as if the whole population votes. Fix initial sets \( E \) and \( N \). Leaving \( N \) unchanged, any elite set of agents \( E' \supseteq E \) leads to the exact same outcome as the initial set \( E \). Unless the distribution of returns to market activity or the set \( N \) change with the elite set \( E \), relaxing the restrictions on who can vote does not change the outcome. More importantly, given \( n \) and \( \tilde{w} \), the ex ante (before the set \( N \) is drawn) likelihood of outcomes is

\(^{30}\)In, e.g., Acemoglu (2008), the elite may also contain low skilled agents. Alternatively, one could assume that there are cutoffs that determine the set \( E \), or any combination of these two approaches. For example, let \( E = [w, \tilde{w}] \subset [0, 1] \) for some \( w > 0 \) and \( \tilde{w} \leq 1 \), which would amount to setting \( P(\chi_e = 1|w = z) = 1 \) for all \( z \in [w, \tilde{w}] \). In this case, a complication may arise. In particular, if \( w \geq \tilde{w} \), then an equilibrium in the political game does not exist. The qualified electorate having full support in the productivity dimension is sufficient (but not necessary) to ensure equilibrium existence. To that extent, I consider it technical in nature. Whether one thinks that the assumption maintained here are reasonable or not probably depends on what one thinks determines the elite set, i.e., what restricts the franchise, income or wealth. In this model, there is no wealth dimension and \( w \) represents only income. In a situation where the correlation of income with wealth is positive but not perfect, the elite set might have full support in the distribution of productivities but a higher median.

\(^{31}\)The assumption that \( \tilde{w}^e \geq \tilde{w} \), while intuitive, is sufficient but not necessary. It implies that all the proofs are unaltered up to notation which simplifies the analysis. Intuitively, it rules out cases where the elite’s median voter chooses to be an appropriator under the winning regime. One could probably guess and verify that, in equilibrium, he would choose to produce as long as \( \tilde{w}^e \geq w^*(\theta(1)) \). However, since this assumption does not seem crazy, I use it to work around this complication.
determined by the second order statistic of the distribution \( \Gamma \), which remains unchanged. So, unless the constraints on access to political competition are relaxed, extending the franchise does not even increase the likelihood of better outcomes.

As a special case, suppose the set \( N \) is a subset of \( E \). That is, I basically assume that even in the case where an elite decides which regime is to be implemented, there is competition of ideas and preferences over regimes within this elite and not everybody can run for office. The results then imply that increasing the franchise does not provide for better outcomes while allowing for more political competition, even within the possibly narrow elite, improves outcomes in a probabilistic sense.

The intuition derives from two distinct aspects. First, the set of decisive voters is the set of agents that are appropriators under at least one of the proposed regimes. This property is due to the producers’ payoffs being equal in both regimes while the appropriators’ payoffs are not. In fact, a set of proposals that has all voters choose production in both regimes cannot be an equilibrium. Second, there is a disconnection of the skill distribution within the elite, the voters, from the skill distribution in the economy. While the elite determines the voting outcome, the payoffs associated with proposed regimes are determined by the relevant distribution in the population. That is, irrespective of who votes, the same set of proposals implies the same appropriation and production payoffs. Therefore, any elite set that contains agents that choose to be appropriators under at least one regime (and satisfies \( \bar{w}^e \geq \bar{w} \), which is generally assumed) prefers the same proposal. For any elite set that does not contain appropriators to-be under at least one regime, the set of proposals is not an equilibrium. So, the assumptions that the elite \( E \) has full support in the productivity dimension ensures that it contains appropriators to-be (and thus that an equilibrium exists) and implies that the social ordering of a given set of alternatives does not differ from the one determined by the whole population. Thus, the voting outcome does not change. It follows that the set of proposals does not change unless the set of candidates changes so that the equilibrium and its characterization are the same as before.

As a further consequence, consider an extension of the franchise that changes the median voter. Since the order the qualified electorate assigns to a given set of alternatives is unchanged, if the choice set does not change, the outcome remains the same. This result differs from what one would expect using median voter models. The reason is as follows. In the median voter model, the choice set is a continuum and the median voter is decisive in the sense that he actually chooses the outcome (from a continuous space) to maximize his objective function. Heterogeneity in a relevant dimension then implies that different decisive median voters choose different outcomes. By contrast, here, the discrete choice set is determined by the political game and remains unchanged. Thus, changing the criterion according to which choices are
evaluated, i.e., changing the franchise, without changing the set of agents that can propose choices does not have any effect unless the criterion changes the order of the choices.

4 Discussion

In this section, I discuss two important aspects of the model that are likely to be of interest.

4.1 Multiplicity and selection of equilibria

First, I briefly discuss the reason for the multiplicity of equilibria in the political game and equilibrium selection.

4.1.1 Multiplicity

Assume for the moment that \( \varepsilon = 0 \), i.e., there is no preference shock. Suppose agents \( w \) and \( w' \), \( w' > w \), compete for office. To simplify the argument by saving on references to additional intermediate results assume that \( w \geq \tilde{w} \). An equilibrium set of proposals \( \{(\theta, \tau), (\theta', \tau')\} \) where \( (\theta, \tau) \) wins the election has to satisfy \( \theta' < \theta < \bar{\theta} \) and \( V(\theta, \tau; \tilde{w}) = V(\theta', \tau'; \tilde{w}) \) or \( (1 - \tau')(1 - F(w^*(\theta)))\theta = (1 - \tau'(1 - F(w^*(\theta')))\theta' \). This implies that \( V(\theta, \tau; w') > V(\theta', \tau'; w) \). Finally, \( \{(\theta, \tau), (\theta', \tau')\} \) has to satisfy \( \tilde{w}(\theta, \tau) \geq V(\theta', \tau'; w) \), \( \tilde{w}(\theta, \tau) \geq \tilde{w}(\theta, \tau') \), \( V(\theta, \tau; w') \geq \tilde{w}(\theta, \tau) \), and \( (\theta, \tau) \) solves problem (P) with \( \tilde{\varphi} = (1 - \tau')(1 - F(w^*(\theta')))\theta' \). In particular, any set of proposals that satisfies the above and either \( V(\theta, \tau; w') = \tilde{w}(\theta, \tau) > V(\theta', \tau'; w) \), \( V(\theta, \tau; w') > \tilde{w}(\theta, \tau) = V(\theta', \tau'; w) \), or \( V(\theta, \tau; w') > \tilde{w}(\theta, \tau) > V(\theta', \tau'; w) \) is an equilibrium. Given \( (\theta', \tau') \), the winner \( w \) cannot profit from deviating. Asking a higher in-office payoff loses the election for sure (recall that \( (\theta, \tau) \) solves problem (P) with the appropriate \( \tilde{\varphi} \)) so that he is at most indifferent between deviating and not deviating. Asking a lower in-office payoff decreases his payoff. Similarly, given \( (\theta, \tau) \), the loser cannot profit from deviating. Proposing a regime that wins the election with positive probability yields him a payoff from winning that is at most equal to the winner’s in-office payoff which is weakly less than his payoff from not deviating. Any other regime that does not win the election does not change payoffs. In fact, the equilibrium where \( V(\theta, \tau; w') = \tilde{w}(\theta, \tau) > V(\theta', \tau'; w) \) is the one that is always selected by the preference shock. When the incumbent has a first mover advantage, then both the equilibria where \( V(\theta, \tau; w') = \tilde{w}(\theta, \tau) > V(\theta', \tau'; w) \) and \( V(\theta, \tau; w') > \tilde{w}(\theta, \tau) = V(\theta', \tau'; w) \) can be selected depending on whether or not the incumbent is the lower skill agent in the competition. If the winner to-be of the election has a first mover advantage, then the equilibrium always satisfies \( V(\theta, \tau; w') = \tilde{w}(\theta, \tau) > V(\theta', \tau'; w). \) Notice that, however, all these equilibria are qualitatively the same in the sense that the same candidate wins offering worse enforcement.

There is a second source of multiplicity. For concreteness, consider the case where, in
equilibrium, \( \{(\theta, \tau), (\theta', \tau')\} \) satisfies \( V(\theta, \tau; w') = \tilde{w}(\theta, \tau) > V(\theta', \tau'; w) \). Since \( w \geq \tilde{w} \), \( V(\theta', \tau'; w) = (1 - \tau')(1 - F(w^*(\theta'))\theta')w \). Together with \( (\theta, \tau) \), any regime \( (\theta'', \tau'') \) that satisfies \( (1 - \tau'')(1 - F(w^*(\theta'')))\theta'') = (1 - \tau')(1 - F(w^*(\theta'))\theta') \) and \( \theta'' < \theta \) would constitute a Nash equilibrium of the political game. However, in all these equilibria, the winner of the election, the regime implemented, and the equilibrium payoffs are the same. Thus, the equilibrium regime \( (\theta, \tau) \) is unique while the losing proposal is indeterminate.

4.1.2 Preference shock

In the political game, I use a preference shock to select a set of equilibria with a unique equilibrium regime and an indeterminate losing proposal. For simplicity, let me refer to any such set as a unique equilibrium. The trick works through altering the probabilities of winning. However, none of the qualitative results that would characterize the continuum of equilibria relies on specific numbers for the probabilities but rather on whether or not the probability is strictly positive. The interpretation I have in mind is as follows. If an agent runs for office making a proposal while the best in-office payoff he can ask when winning is strictly less than his outside payoff when he loses, voters might perceive him to be an idealistic kind of person. The idea is that given that agents select themselves into running, his behavior might be associated with characteristics like being socially engaged, or willing to take on responsibility or similar expressions. This consideration is assumed to be completely independent of the proposal actually made by that agent, i.e., whether or not he actually proposed the regime that would give him the maximum attainable in-office payoff.

Somewhat more obvious foci for the shock where analyzed. None of them was successful in selecting a unique equilibrium. As an example, assuming that voters would prefer the agent that asks the lower in-office payoff would not remove the multiplicity. The in-office payoffs end up equalized but the level still depends on the beliefs on the opponents’ play that are still not pinned down. Also, assuming that voters would prefer an office holder with a higher skill or that there is a small probability of mistakes in the aggregation of votes renders equilibria nonexistent altogether. In both cases, there is no way that any proposal gives a probability one of winning or losing.

Suppose there was a reasonable way to select the equilibrium that satisfies something \( V(\theta_L, \tau_L; w_L) = \tilde{w}(\theta_L, \tau_L) \). In this case, the equilibrium outcome of the political game depends on the office holder’s skill. That is, two societies with the same skill distribution and the same office holder implement the same regime. However, the results concerning the constraints to participation still hold. To see this, notice that the comparative statics of the political game equilibrium are with respect to \( w_L \) but unaltered otherwise. In the selection game, \( w_1 \) still has a (weakly) dominant strategy of running as he would win and implement
the best possible outcome. This way he gets an in-office payoff equal to his out-of-office payoff under the best possible regime rather than an out-of-office payoff under a worse one. His opponent is indeterminate but does not matter since \( w_1 \) wins the election. The comparative statics with respect to the political fundamentals depend on the behavior of the first order statistic, implying that the results on access to political competition are unaltered. The analysis of the qualified electorate is not touched at all.

Finally, in a this stylized model, it is not clear why an agent should care for anything else but expected utility from consumption provided by the policy. However, in equilibrium, the shock does not “show up”, i.e., it does neither affect the outcome nor introduce an additional source of uncertainty nor alter the qualitative characteristics of equilibria as compared to the set of equilibria if the shock were absent.

### 4.1.3 Sequentiality

If there is an incumbent office holder, then the agents running for office are not in the same position. In dictatorial regimes, the incumbent often has some control over the media. In any regime, the office holder has revealed at least some information about his general policy platform over the previous term. In some regimes, potential opponents have to run for candidacy within the opposition before running for office. That is, while they compete with each other, the incumbent can prepare for the competition with the opponents he is likely to face. Thus, one could be inclined to assume that the incumbent has a first mover advantage the implications of which are briefly described in the discussion of proposition 2. However, another possible and not any more arbitrary assignment of the first mover advantage could allow the winner to move first. The interpretation could be along the lines of something like momentum. If the incumbent wins, he uses the fact that he has established some sort of successful policy platform in the previous term. If the opposition wins, then it wins because it has strong foundations in the voting body and clearly stands for a position opposing the incumbent. This assignment would actually simplify the analysis. In particular, it would select the exact same equilibrium as the preference shock does and would allow to dispense with an additional qualification needed.

### 4.2 One-dimensional policy space

Finally, I discuss two conceivable simplifications that reduce the policy space to one dimension and show that, besides making the model less refutable, they either miss the strategic interaction or actually complicate the analysis. Consider a somewhat more general version of
the office holder’s budget constraint.

\[
\tau \int_{w^*(\theta)}^{1} w f(w) dw + T (1 - F(w^*(\theta))) = \bar{w} + g(\theta),
\]

where \( \tau \in [0, 1] \) and \( T \geq 0 \) are a proportional and a lump sum tax collected from producers (appropriators cannot pay taxes). That is, the cost of implementing the enforcement regime and the office holder’s payoff are to be financed by the tax receipts. A policy regime is given by \((\theta, \tau, T, \bar{w})\) and, imposing \( T = 0 \), the policy space is two-dimensional since the budget is satisfied with equality. Let’s disregard the budget constraint and assume that there is a map \( \tau : [0, 1] \to [0, 1], \tau(\theta) \in [0, 1], \) where \( \tau(\cdot) \) is a (weakly) decreasing function of \( \theta \). For simplicity, I maintain the assumption that the technology implementing enforcement implies \( \tau(\theta) = (1 - \theta) \) so that \( 1 - \tau = \theta \). The nature of the competitive equilibrium in the underlying economy is untouched. A producer \( w \)’s payoff is \( \varphi(\theta)w = \theta(1 - F(w^*(\theta)))\theta w \), an appropriator’s payoff is \( \nu(\theta) = \theta^2 \int_{w^*(\theta)}^{1} w f(w) dw \), and the value function of the occupational choice problem is \( V(\theta; w) = \max \{ \varphi(\theta)w; \nu(\theta) \} \). \(^{32}\) As long as the payoff in office is not determined by \( \theta \), there are at least two policy dimensions, enforcement and in-office payoff.

If I assume that the winner of the election implements the regime he proposed and then moves on as a generic citizen under this regime, there are two important findings. \(^{33}\) First, there is no strategic interaction between the candidates. The outcome solely depends on whether or not the higher skill candidate’s productivity \( w_H \) is above a threshold that is completely determined by the distribution, i.e., fundamentals. All societies with a rather high \( w_H \) implement the exact same enforcement regime. Moreover, this regime is fixed by the fundamental distribution in the dimension of skill or productivity which is not a very nice feature. With respect to comparative statics, once \( w_H \) is above the threshold, there is no change with increases in \( w_H \). Once \( w_H \) is below the threshold, there is no change with decreases in \( w_H \). Another disadvantageous feature is that the selection game does not have a that clean solution. The reason is that low skill agents prefer the worse enforcement outcome which obtains as soon as \( w_H \) is below the threshold. That is, all low skill agents in \( N \) select to run so that the probability of a high \( w_H \) decreases. Similarly, all high skill agents run to increase the probability of a high \( w_H \). Thus, all agents in \( N \) select to run and the selection is random. \(^{34}\) In the original model, all agents want the low skill agent to run for office which

\[^{32}\]In addition, the assumption that both \( \varphi \) and \( \nu \) are strictly quasiconcave in \( \theta \) and the distribution \( F \) satisfies

\[
2 \left( \int_{\bar{w}}^{1} w f(w) dw \right)^2 < \bar{w}^2 f(\bar{w}) \left( 1 - \int_{\bar{w}}^{1} F(w) dw \right),
\]

where \( \bar{w} \equiv F^{-1}(\frac{1}{2}) \), are needed.

\[^{33}\]This assumption is the same as assuming that he gets his out-of-office payoff as in-office payoff. It rules out the interesting aspect of holding office being a separate occupation.

\[^{34}\]Moreover, if \( w_H \) is below the threshold, then there are multiple equilibria.
allows for the clean description of the outcome. Finally, this implies that no clear statements can be made about the comparative statics of restrictions to participation which is a main result from the original model.

Alternatively, I could assume that the winner’s in-office payoff is determined by an exogenous map \( \tilde{w} : [0, 1] \rightarrow [0, 1] \), \( \tilde{w}(\theta) \in [0, 1] \), where \( \tilde{w}(\cdot) \) is increasing in \( \theta \) and, for simplicity, \( \tilde{w}(0) = 0 \). That is, the enforcement policy \( \theta \) simultaneously determines \( \tau \) and \( \tilde{w} \).\(^{35}\) Moreover, worse enforcement comes with higher in-office payoffs by assumption.\(^{36}\) To deal with multiple equilibria that arise for the exact same reason as in the original model, I assume that there is a preference shock that works in the same way as before and simply delivers the condition needed. This “simplification” actually complicates the analysis. The reason is that I impose that \( \theta \) and \( \tau \) are inversely related. As a consequence, the producer’s payoff factor has a quadratic-looking form in \( \theta \) even off the equilibrium. In the original model, this holds true only in equilibrium, while, off the equilibrium, this factor is simply strictly decreasing in \( \theta \). The latter aspect simplifies single deviation arguments in the proofs of virtually all intermediate results. The consequences not present in the original model are (at least) three-fold. First, intermediate arguments are more difficult since somewhat more conditional and equilibria are harder to describe. Second, there is an additional pooling equilibrium that would not exist if not for the hump-shaped payoff factor. Third, there are conceivable cases, e.g., when \( \tilde{w}(\cdot) \) is flat, in which an equilibrium does not exist. If a “nice” equilibrium exists, it behaves mostly similar to the one in the original model. (So the rest of the model should work fine, too.) Also, while more conditional, the argument works along pretty much the same line as in the original model (I even need a preference shock). Finally, I assume that \( \tilde{w}(\cdot) \) is strictly increasing in its argument \( \theta \) (besides the other ad hoc map that inversely connects \( \tau \) and \( \theta \)). This does not only have the flavor of a rather ad hoc assumption creating additional fundamentals. (What form does \( \tilde{w} \) take and does it differ across societies? Further assumptions are needed to derive analytical expressions as in the original model.) We also lose insights about how the political game generates rents from being the office holder when institutions or enforcement are weak. In particular, this assumption is a result in the original model and, thus, an important testable prediction that contributes to the theory being falsifiable. This is lost here.

5 Conclusion

In this paper, I address the question for what reason societies choose different levels of property rights enforcement and ask what role constraints to participation in the decision making

\(^{35}\)Similarly, one could assume the tax \( \tau \) to be the policy together with a decreasing map \( \theta(\tau) \) and an increasing map \( \tilde{w}(\tau) \) (intuitively, both higher taxes and weaker enforcement relax the budget constraint with respect to the in-office payoff).

\(^{36}\)This implication is an endogenous result from the original model deriving from the strategic interaction.
process play? I analyze a mechanism arising from strategic interaction in a political game. It implies that the choice set facing society and thus the decision outcome depends on the loser to-be’s productivity. As a consequence, looking at the skill distribution and the office holder only, two societies generally implement different regimes while they appear to be very similar in these supposedly relevant dimensions. Important implications are that easier access to political competition increases the likelihood of better outcomes while extending the franchise alone does not. These results suggest at least two conclusions. The strategic interactions in the separate determination of the choice set and the social ordering might be important and spurring political competition is more essential for good outcomes than extending the franchise.

A Sufficient conditions for assumption 2

Consider the functions $\varphi : [0, 1]^2 \to \mathbb{R}$, $\nu : [0, 1]^2 \to \mathbb{R}$, and $\tilde{w} : [0, 1]^2 \to \mathbb{R}$ given by

$$
\varphi(\theta, \tau) = (1 - F(w^*(\theta))\theta)(1 - \tau)
\nu(\theta, \tau) = (1 - \tau)\theta \int_{w^*(\theta)}^{1} w f(w) dw
\tilde{w}(\theta, \tau) = \tau \int_{w^*(\theta)}^{1} w f(w) dw - g(\theta).
$$

**Condition 1.** A set of sufficient conditions for assumption 2 to hold is

$$(16) \quad -\frac{f'(w)w}{f(w)} \leq 1 + \bar{\theta}, \forall w,$$

$$(17) \quad -\frac{g''(\theta)\theta}{g'(\theta)} \geq \frac{2\bar{\theta}w f(\bar{w})}{(1 - \frac{1}{2}\bar{\theta})^2}, \forall \theta < \bar{\theta},$$

where $\bar{w} = F^{-1}(\frac{1}{2})$ and $\bar{\theta} = \tilde{w} \left(1 - \int_{\bar{w}}^{1} F(w) dw\right)^{-1}$.

To see that, first, fix $\tau$ and consider $\nu(\theta, \tau)$. This function of $\theta$ is strictly concave (and thus strictly quasiconcave) if and only if

$$
\frac{\partial}{\partial \theta} (1 - \tau) \left[ \int_{w^*(\theta)}^{1} w f(w) dw - \theta w^*(\theta) f(w^*(\theta)) w^*(\theta) \right]
= - (1 - \tau) \theta f(w^*(\theta)) w^*(\theta)^2 \left[ 3 + \frac{w^*(\theta) f'(w^*(\theta)) f(w^*(\theta))}{f(w^*(\theta))} + \theta^2 f(w^*(\theta)) w^*(\theta) \right] < 0.
$$

So it is sufficient to have $3 + \theta^2 f(w^*(\theta)) w^*(\theta) \geq - \frac{w^*(\theta) f'(w^*(\theta))}{f(w^*(\theta))}$ which holds trivially for all $w \leq \bar{w}$ (and thus $\theta \leq \bar{\theta}$). If $w > \bar{w}$, then it is sufficient to satisfy $3 \geq - \frac{w^*(\theta) f'(w^*(\theta))}{f(w^*(\theta))}$. Now, given $\tau$, consider $\tilde{w}(\theta, \tau)$. This function of $\theta$ is strictly concave (and thus strictly
quasiconcave) if and only if

$$\frac{\partial}{\partial \theta} \left[-\tau w^*(\theta) f(w^*(\theta)) w'^*(\theta) - g'(\theta)\right]$$

$$= -\tau \left[w'^*(\theta)^2 [f(w^*(\theta)) + w^*(\theta) f'(w^*(\theta))] + w^*(\theta) f(w^*(\theta)) w''(\theta)\right] - g''(\theta) < 0.$$ 

Thus, it is sufficient to have that

$$w'^*(\theta)^2 [f(w^*(\theta)) + w^*(\theta) f'(w^*(\theta))] + w^*(\theta) f(w^*(\theta)) w''(\theta)$$

$$= w'^*(\theta)^2 f(w^*(\theta)) \left(1 + \frac{w^*(\theta) f'(w^*(\theta))}{f(w^*(\theta))} + 2\theta F(w^*(\theta)) + \theta^2 f(w^*(\theta)) w''(\theta)\right) \geq 0.$$ 

This condition is satisfied whenever $\theta \leq \bar{\theta} \leq \theta_{mod}$ since then $f'(w^*(\theta)) \geq 0$. If $\theta > \bar{\theta}$,

$$1 + \frac{w^*(\theta) f'(w^*(\theta))}{f(w^*(\theta))} + 2\theta F(w^*(\theta)) + \theta^2 f(w^*(\theta)) w''(\theta) > 1 + \frac{w^*(\theta) f'(w^*(\theta))}{f(w^*(\theta))} + 2\bar{\theta} F(\bar{w})$$

so that it is sufficient to require that $-\frac{w f'(w)}{f(w)} \leq 1 + \bar{\theta}$ for all $w > \bar{w}$.

Next, consider the bordered Hessians for either function. They are given by

$$H_{\varphi} = \begin{bmatrix} 0 & -(1-\tau)[F(w^*(\theta)) + \theta f(w^*(\theta)) w'^*(\theta)] & -(1-F(w^*(\theta))\theta) \\ -(1-\tau)[2f(w^*(\theta)) w'^*(\theta) + \theta f'(w^*(\theta)) w'^*(\theta)^2 + \theta f(w^*(\theta)) w'^*(\theta)] & [F(w^*(\theta)) + \theta f(w^*(\theta)) w'^*(\theta)] & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$H_{\bar{w}} = \begin{bmatrix} 0 & -\tau w^*(\theta) f(w^*(\theta)) w'^*(\theta) - g'(\theta) & \int_{w^*(\theta)}^{1} \frac{w f(w) \bar{w}}{f(w)} dw \\ -(\tau [w'^*(\theta)^2 [f(w^*(\theta)) + w^*(\theta) f'(w^*(\theta))] + w^*(\theta) f(w^*(\theta)) w''(\theta)] - \tau w^*(\theta) f(w^*(\theta)) w'^*(\theta) - g''(\theta) & -w^*(\theta) f(w^*(\theta)) w'^*(\theta) & 0 \end{bmatrix}.$$ 

We are looking for sufficient conditions that imply that, for all $(\theta, \tau)$, $(-1)^k \text{Det}(H^k_{\varphi}) > 0$ for $k = 1, 2$ and $j = \varphi, \bar{w}$. Clearly, for all $(\theta, \tau)$,

$$(-1)^1 \text{Det}(H^1_{\varphi}) = (1-\tau)^2 [F(w^*(\theta)) + \theta f(w^*(\theta)) w'^*(\theta)]^2 > 0$$

$$(-1)^1 \text{Det}(H^1_{\bar{w}}) = [-\tau w^*(\theta) f(w^*(\theta)) w'^*(\theta) - g'(\theta)]^2 > 0.$$ 

Then,

$$\frac{\text{Det}(H^2_{\varphi})}{(1-\tau)} = (1-F(w^*(\theta))\theta) \left[2 (F(w^*(\theta)) + \theta f(w^*(\theta)) w'^*(\theta))^2 + (1-F(w^*(\theta))\theta) [2 f(w^*(\theta)) w'^*(\theta) + \theta f'(w^*(\theta)) w'^*(\theta)^2 + \theta f(w^*(\theta)) w''(\theta)]\right].$$
This can be rewritten to equal
\[ \theta^{-1}w^\ast(\theta) f(w^\ast(\theta)) \left( 4F(w^\ast(\theta)) + \frac{2F(w^\ast(\theta))^2(1-F(w^\ast(\theta))\theta)}{w^\ast(\theta)f(w^\ast(\theta))} + \frac{w^\ast(\theta)f(w^\ast(\theta)) + \theta w''(\theta) f(w^\ast(\theta))}{1-F(w^\ast(\theta))\theta} \right) \]
\[ + 2 + \frac{w^\ast(\theta)f'(w^\ast(\theta))}{f(w^\ast(\theta))} \]
\[ > \theta^{-1}w^\ast(\theta) f(w^\ast(\theta)) \left( 4\theta F(w^\ast(\theta)) + 2 + \frac{w^\ast(\theta)f'(w^\ast(\theta))}{f(w^\ast(\theta))} \right) \]
so that it is sufficient to require that\[ 4\theta F(w^\ast(\theta)) + 2 + \frac{w^\ast(\theta)f'(w^\ast(\theta))}{f(w^\ast(\theta))} \geq 0. \]
This condition is satisfied whenever \( \theta \leq \bar{\theta} \leq \theta_{mod} \) since then \( f'(w^\ast(\theta)) \geq 0. \) If \( \theta > \bar{\theta}, \) then
\[ 4\theta F(w^\ast(\theta)) + 2 + \frac{w^\ast(\theta)f'(w^\ast(\theta))}{f(w^\ast(\theta))} > 4\bar{\theta} F(\bar{w}) + 2 + \frac{w^\ast(\theta)f'(w^\ast(\theta))}{f(w^\ast(\theta))} = 2(1 + \bar{\theta}) + \frac{w^\ast(\theta)f'(w^\ast(\theta))}{f(w^\ast(\theta))}. \]
Thus it is sufficient to require\[ -\frac{wf'(w)}{f(w)} \leq 2(1 + \bar{\theta}) \]for all \( w > \bar{w}. \)

Similarly,
\[ \text{Det}(H^2_\theta) = \left( \int_{w^\ast(\theta)}^1 \frac{w}{f(w)} dw \right) \left[ -2 \left( -\tau w^\ast(\theta)f(w^\ast(\theta))w''(\theta) - g'(\theta) \right) w^\ast(\theta)f(w^\ast(\theta))w''(\theta) \right] \]
\[ + \left( \int_{w^\ast(\theta)}^1 \frac{w}{f(w)} dw \right) \left[ \tau \left[ w''(\theta)^2[f(w^\ast(\theta)) + w^\ast(\theta)f'(w^\ast(\theta))] + w^\ast(\theta)f(w^\ast(\theta))w''(\theta) \right] + g''(\theta) \right] \]
\[ > 0 \]
if and only if
\[ \left( \int_{w^\ast(\theta)}^1 \frac{w}{f(w)} dw \right) \left[ \tau \left[ w''(\theta)^2[f(w^\ast(\theta)) + w^\ast(\theta)f'(w^\ast(\theta))] + w^\ast(\theta)f(w^\ast(\theta))w''(\theta) \right] + g''(\theta) \right] \]
\[ > 2 \left( -\tau w^\ast(\theta)f(w^\ast(\theta))w''(\theta) - g'(\theta) \right) w^\ast(\theta)f(w^\ast(\theta))w''(\theta). \]
The condition\[ -\frac{wf'(w)}{f(w)} \leq 1 + \bar{\theta} \]for all \( w > \bar{w} \) is sufficient for the left hand side to always be greater than or equal to \( g''(\theta) \left( \int_{w^\ast(\theta)}^1 \frac{w}{f(w)} dw \right). \) Additionally, as shown above, this condition implies that, given \( \tau, \bar{w}(\theta, \tau) \) is strictly quasiconcave. Thus, assumption 2 can be used to prove that \( \bar{w}(\cdot, \tau) \) has a unique maximum argument which is strictly less than \( \bar{\theta} \) (see lemma 3). This implies that the right hand side is negative for all \( \theta \geq \bar{\theta}. \) When \( \theta < \bar{\theta}, \) notice further, that, under the above condition, the left hand side is increasing in \( \tau, \) while the right hand side is decreasing in \( \tau. \) Hence, with higher \( \tau, \) this inequality is easier to satisfy. So, if it is satisfied
at \( \tau = 0 \), then it is satisfied for all \( \tau \in [0, 1] \). Thus, it is sufficient to require that

\[
g''(\theta) \left( \int_{w(\theta)}^{1} w f(w) dw \right) \geq -2g'(\theta) w^*(\theta)f(w^*(\theta)) w'^*(\theta)
\]

for all \( \theta < \bar{\theta} \). This can be rewritten to yield

\[
\frac{g''(\theta)}{-g'(\theta)} \geq \frac{2w^*(\theta)^2 f(w^*(\theta))}{\theta(1 - F(w^*(\theta))) \int_{w(\theta)}^{1} w f(w) dw}
\]

\[
\frac{g''(\theta)}{-g'(\theta)} \geq \frac{2w^*(\theta)^2 f(w^*(\theta))}{\theta^{-1} w^*(\theta)(1 - F(w^*(\theta))) \theta^2}
\]

\[
\frac{g''(\theta)}{-g'(\theta)} \geq \frac{2\theta w^*(\theta) f(w^*(\theta))}{(1 - F(w^*(\theta))) \theta^2}
\]

Since the right hand side is increasing in \( \theta \) and we are concerned with \( \theta < \bar{\theta} \) and \( \bar{\theta} \leq \theta_{\text{mod}} \), it is sufficient to require that

\[
\frac{g''(\theta) \theta}{-g'(\theta)} \geq \frac{2\theta \tilde{w} f(\tilde{w})}{(1 - \frac{1}{2}) \theta^2},
\]

for all \( \theta < \bar{\theta} \).

**B** The probability of winning the election

**B.1** A general formulation

This section provides a general formulation of the probability of winning. Letting \( w_i \) and \( w_{-i} \) be the candidates and \( \sigma_i = (\theta_i, \tau_i) \) and \( \sigma_{-i} = (\theta_{-i}, \tau_{-i}) \) their proposals, let 

\( P(\sigma_i, \sigma_{-i}; w_i, w_{-i}) = \text{Prob}\{w_i \text{ wins} | w_{-i}, \{(\theta_i, \tau_i), (\theta_{-i}, \tau_{-i})\}\} \)

be the probability of candidate \( w_i, i \in \{L, H\} \), winning the election given his opponents skill \( w_{-i}, -i \in \{L, H\} \setminus \{i\} \), and both the regime he proposes and the one proposed by his opponent. To account for the implications of the preference shock, a bit notation needs to be introduced. Let 

\( \mathcal{I}(\sigma_i, \sigma_{-i}) = \{w \in [0, 1] : V(\sigma_i; w) = V(\sigma_{-i}; w)\} \)

be the set of all agents that are indifferent between the two proposals. Similarly, let 

\( \mathcal{I}^+(\sigma_i, \sigma_{-i}) = \{w \in [0, 1] : V(\sigma_i; w) > V(\sigma_{-i}; w)\} \)

and 

\( \mathcal{I}^-(\sigma_i, \sigma_{-i}) = \{w \in [0, 1] : V(\sigma_i; w) < V(\sigma_{-i}; w)\} \)

be the sets of all agents that prefer proposals \( \sigma_i \) and \( \sigma_{-i} \), respectively. Any one set can be empty and \( \mathcal{I}^+(\sigma_i, \sigma_{-i}) = \mathcal{I}^-(\sigma_{-i}, \sigma_i) \). The following lemma is helpful.

**Lemma 1.** The sets \( \mathcal{I}(\sigma_i, \sigma_{-i}), \mathcal{I}^+(\sigma_i, \sigma_{-i}), \) and \( \mathcal{I}^-(\sigma_i, \sigma_{-i}) \) are intervals.

**Proof.** Consider first \( \mathcal{I}(\sigma_i, \sigma_{-i}) \). If \( \mathcal{I}(\sigma_i, \sigma_{-i}) = \emptyset \) or \( |\mathcal{I}(\sigma_i, \sigma_{-i})| = 1 \), then, trivially, it is an interval. Let \( |\mathcal{I}(\sigma_i, \sigma_{-i})| > 1 \) and \( w, w' \in \mathcal{I}(\sigma_i, \sigma_{-i}) \), \( w < w' \). Consider any \( w'' \in (w, w') \). Suppose for a contradiction that \( w'' \notin \mathcal{I}(\sigma_i, \sigma_{-i}) \), i.e., \( V(\sigma_i; w'') \neq V(\sigma_{-i}; w'') \). If \( \theta_i = \theta_{-i} \), Suppose that \( \tau_i \neq \tau_{-i} \). Since all agents
choose the same occupation under either regime, \( I(\sigma_i, \sigma_{-i}) = \emptyset \). Thus, if \( \theta_i = \theta_{-i} \), then \( \tau_i = \tau_{-i} \) and \( I(\sigma_i, \sigma_{-i}) = [0,1] \). Suppose that \( \theta_i \neq \theta_{-i} \). Without loss of generality, assume that \( \theta_i < \theta_{-i} \). There are three cases, \( w'' \leq w'(\theta_i) \), \( w'(\theta_i) < w'' \leq w'(\theta_{-i}) \), and \( w'' < w'(\theta_{-i}) \). If \( w'' \leq w'(\theta_i) \), then \( \nu(\sigma_i) \neq \nu(\sigma_{-i}) \) which, since \( w < w'' \), implies that \( w \notin I(\sigma_i, \sigma_{-i}) \), a contradiction. If \( w'' < w'(\theta_{-i}) \), then \( \nu(\sigma_i) \neq \nu(\sigma_{-i}) \) which, since \( w'' < w' \), implies that \( w \notin I(\sigma_i, \sigma_{-i}) \), a contradiction. If \( w'(\theta_i) < w'' \leq w'(\theta_{-i}) \), then \( \nu(\sigma_i) w'' \neq \nu(\sigma_{-i}) \).

On the one hand, if \( \varphi(\sigma_i) w'' < \nu(\sigma_{-i}) \), then \( \varphi(\sigma_i) w < \nu(\sigma_{-i}) \) and \( \nu(\sigma_i) < \varphi(\sigma_{-i}) w'' < \nu(\sigma_{-i}) \) so that \( V(\sigma_{-i}; w) = \nu(\sigma_{-i}) > \max\{\varphi(\sigma_i) w, \nu(\sigma_i)\} = V(\sigma_i; w) \). That is \( w \notin I(\sigma_i, \sigma_{-i}) \), a contradiction. On the other hand, if \( \varphi(\sigma_i) w'' > \nu(\sigma_{-i}) \), then \( \varphi(\sigma_i) w > \nu(\sigma_{-i}) \). Since \( w, w' \in I(\sigma_i, \sigma_{-i}) \), it has to hold that \( \varphi(\sigma_i) (\varphi(\sigma_{-i}) \) and \( \nu(\sigma_i) = \nu(\sigma_{-i}) \) which implies that \( w'(\theta_i) = w'(\theta_{-i}) \). Since \( w'' \) is strictly increasing on \((0,1)\), \( \theta_i = \theta_{-i} \), a contradiction. Therefore, by contradiction, \( w'' \in I(\sigma_i, \sigma_{-i}) \) and \( I(\sigma_i, \sigma_{-i}) \) is an interval.

Consider next \( I^+(\sigma_i, \sigma_{-i}) \). If \( I^+(\sigma_i, \sigma_{-i}) = \emptyset \) or \( |I^+(\sigma_i, \sigma_{-i})| = 1 \), then, trivially, it is an interval. Let \( |I^+(\sigma_i, \sigma_{-i})| > 1 \). Suppose that \( \theta_i = \theta_{-i} \). If \( \tau_i = \tau_{-i} \), then \( I(\sigma_i, \sigma_{-i}) = [0,1] \) and, thus, \( I^+(\sigma_i, \sigma_{-i}) = \emptyset \). If \( \tau_i > \tau_{-i} \), then \( I^+(\sigma_i, \sigma_{-i}) = [0,1] \) and, thus, \( I^+(\sigma_i, \sigma_{-i}) = \emptyset \). If \( \tau_i < \tau_{-i} \), then \( I^+(\sigma_i, \sigma_{-i}) = [0,1] \).

Suppose that \( \theta_i \neq \theta_{-i} \). Assume that \( w, w' \in I^+(\sigma_i, \sigma_{-i}) \), \( w < w' \), and consider \( w'' \in (w, w') \). Suppose for a contradiction that \( w'' \notin I^+(\sigma_i, \sigma_{-i}) \), i.e., \( V(\sigma_i; w'') \leq V(\sigma_{-i}; w'' \)). If \( \theta_i < \theta_{-i} \), then there are three case, \( w'' \leq w'(\theta_i) \), \( w'(\theta_i) < w'' \leq w'(\theta_{-i}) \), and \( w'' < w'(\theta_{-i}) \). If \( w'' \leq w'(\theta_i) \), then \( w'' \leq w'(\theta_i) \) implies that \( w \notin I^+(\sigma_i, \sigma_{-i}) \), a contradiction. If \( w'(\theta_i) < w'' \), then \( w'(\theta_i) < w'(\theta_{-i}) < w'' < w' \), so that \( w'' \notin I^+(\sigma_i, \sigma_{-i}) \) implies \( w \notin I^+(\sigma_i, \sigma_{-i}) \), a contradiction. If \( w'(\theta_i) < w'' \leq w'(\theta_{-i}) \), then \( \varphi(\sigma_i) w < \varphi(\sigma_{-i}) w'' \leq \nu(\sigma_{-i}) \) and \( \nu(\sigma_i) < \varphi(\sigma_{-i}) w'' \leq \nu(\sigma_{-i}) \). That is, \( V(\sigma_{-i}; w) \geq \nu(\sigma_{-i}) \max\{\varphi(\sigma_i) w, \nu(\sigma_i)\} = V(\sigma_i; w) \), which implies \( w \notin I^+(\sigma_i, \sigma_{-i}) \), a contradiction. If \( \theta_i < \theta_{-i} \), then \( w'' \leq w'(\theta_{-i}) \), \( w'(\theta_{-i}) \leq w'' \leq w'(\theta_i) \), or \( w'' < w' \). If \( w'' \leq w'(\theta_{-i}) \), then \( w'' \leq w'(\theta_{-i}) \) and \( w'' \notin I^+(\sigma_i, \sigma_{-i}) \) implies \( w \notin I^+(\sigma_i, \sigma_{-i}) \), a contradiction. If \( w'(\theta_i) < w'' \), then \( w'(\theta_i) < w'(\theta_{-i}) < w'' < w' \) and \( w'' \notin I^+(\sigma_i, \sigma_{-i}) \) implies \( w \notin I^+(\sigma_i, \sigma_{-i}) \), a contradiction. If \( w'(\theta_i) < w'' \), then \( w'(\theta_i) < w'(\theta_{-i}) < w'' < w' \) and \( w'' \notin I^+(\sigma_i, \sigma_{-i}) \) implies \( w \notin I^+(\sigma_i, \sigma_{-i}) \), a contradiction. If \( w'(\theta_i) < w'' \leq w'(\theta_{-i}) \), then \( \varphi(\sigma_i) w'' \leq \nu(\sigma_{-i}) w'' < \varphi(\sigma_{-i}) w' \) so that \( \varphi(\sigma_i) \leq \varphi(\sigma_{-i}) \) and \( \nu(\sigma_i) < \varphi(\sigma_{-i}) w' \). That is, \( V(\sigma_{-i}; w') \geq \varphi(\sigma_{-i}) w' \geq \max\{\varphi(\sigma_i) w', \nu(\sigma_i)\} = V(\sigma_i; w') \) which contradicts \( w' \in I^+(\sigma_i, \sigma_{-i}) \). Therefore, by contradiction, \( w'' \in I^+(\sigma_i, \sigma_{-i}) \) and \( I^+(\sigma_i, \sigma_{-i}) \) is an interval. Since \( I^+(\sigma_i, \sigma_{-i}) = I^+(\sigma_{-i}, \sigma_i) \), this completes the proof.

Q.E.D.

Let \( M(\sigma_i, \sigma_{-i}) \equiv F(\sup I(\sigma_i, \sigma_{-i}) - F(\inf I(\sigma_i, \sigma_{-i}) \) be the measure of the set of agents that are indifferent between the two proposals. Define \( M^+(\sigma_i, \sigma_{-i}) \) and \( M^-(\sigma_i, \sigma_{-i}) \) analogously. Additionally, define

\[
T(w_i) = \{\sigma \in [0,1]^2 : \alpha^\prime \in [0,1]^2 \mid (M^+(\sigma', \sigma) + \frac{1}{2} M(\sigma', \sigma) \geq \frac{1}{2}) \implies (\bar{w}(\sigma'; w_i) < V(\sigma; w_i))\}
\]

to be the set of regimes \( \sigma \) for which any platform \( \sigma' \) that could win the election for candidate \( w_i \) without the preference shock offers him a worse in-office payoff than the payoff of losing. Then, \( T^+(w_i, w_{-i}) = \{(\sigma, \sigma') \in [0,1]^4 : \sigma \neq T(w_{-i}, \sigma') \in T(w_i) \} \) is the set of sets of proposals where the preference shock favors candidate \( w_i \), \( T^-(w_i, w_{-i}) = \{(\sigma, \sigma') \in [0,1]^4 : \sigma \in T(w_{-i}), \sigma' \notin T(w_i) \} \) is the set of sets of proposals where the preference shock favors candidate \( w_{-i} \), while \( T(w_i, w_{-i}) = (T^+(w_i, w_{-i}) \cup T^-(w_i, w_{-i}))^c = [0,1]^4 - (T^+(w_i, w_{-i}) \cup T^-(w_i, w_{-i})) \) is the set of proposals where the preference shock is neutral. Then, for all \( \varepsilon \geq 0 \), the probability of \( w_i \)'s proposal \( \sigma_i \) winning over \( w_{-i} \)'s proposal

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\( \sigma_{-i} \) is given by

\[
\text{Prob}\{w_i \text{ wins} \mid w_{-i}, \{(\theta_i, \tau_i), (\theta_{-i}, \tau_{-i})\}\} = P(\sigma_i, \sigma_{-i}; w_i, w_{-i}) = \\
\begin{cases}
1 & \text{if } (M^+(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) > \frac{1}{2}) \land (\sigma_i, \sigma_{-i}) \in T(w_i, w_{-i}), \\
1 & \text{if } (M^+(\sigma_i, \sigma_{-i}) > \frac{1}{2}), \\
1 & \text{if } (M^+(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) > \frac{1}{2}) \land (\sigma_i, \sigma_{-i}) \in T^+(w_i, w_{-i}), \\
1 - \frac{1}{2} \varepsilon & \text{if } (M^+(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) > \frac{1}{2} = M^+(\sigma_i, \sigma_{-i})) \land (\sigma_i, \sigma_{-i}) \in T^+(w_i, w_{-i}), \\
1 - \varepsilon & \text{if } (M^+(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) > \frac{1}{2} > M^+(\sigma_i, \sigma_{-i})) \land (\sigma_i, \sigma_{-i}) \in T^+(w_i, w_{-i}), \\
\frac{1}{2} (1 + \varepsilon) & \text{if } (M^+(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) = \frac{1}{2}) \land (\sigma_i, \sigma_{-i}) \in T^+(w_i, w_{-i}), \\
\frac{1}{2} (1 - \varepsilon) & \text{if } (M^+(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) = \frac{1}{2}) \land (\sigma_i, \sigma_{-i}) \in T(w_i, w_{-i}), \\
\varepsilon & \text{if } (M^-(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) > \frac{1}{2} > M^-(\sigma_i, \sigma_{-i})) \land (\sigma_i, \sigma_{-i}) \in T^+(w_i, w_{-i}), \\
\frac{1}{2} \varepsilon & \text{if } (M^-(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) > \frac{1}{2} = M^-(\sigma_i, \sigma_{-i})) \land (\sigma_i, \sigma_{-i}) \in T^+(w_i, w_{-i}), \\
0 & \text{if } (M^-(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) > \frac{1}{2}) \land (\sigma_i, \sigma_{-i}) \in T^+(w_i, w_{-i}), \\
0 & \text{if } (M^-(\sigma_i, \sigma_{-i}) + \frac{1}{2} M(\sigma_i, \sigma_{-i}) < \frac{1}{2}) \land (\sigma_i, \sigma_{-i}) \in T(w_i, w_{-i}). \\
\end{cases}
\]

B.2 A specific formulation given intermediate results

In this section I report the definition of the specific function that assigns probabilities of winning the election which I derive from lemma 5 in appendix E. The functions \( P_i : [0, 1]^4 \rightarrow [0, 1] \) maps the set of regimes to the probability of agent \( i \) winning the election given he proposes \( (\theta_i, \tau_i) \) while his opponent proposes \( (\theta_{-i}, \tau_{-i}) \). If \( \bar{w}^*(w_i, \varphi_i) \geq V(\theta_{-i}, \tau_{-i}; w_i) \) for all \( i \in \{L, H\} \) or \( \bar{w}^*(w_i, \varphi_i) < V(\theta_{-i}, \tau_{-i}; w_i) \) for all \( i \in \{L, H\} \), then

\[
P(\sigma_i, \sigma_{-i}; w_i, w_{-i}) = \\
\begin{cases}
1 & \text{if } V(\theta_i, \tau_i; \bar{w}) > V(\theta_{-i}, \tau_{-i}; \bar{w}) \\
1 & \text{if } V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w}) \text{ and } \theta_{-i} < \theta_i \leq \bar{\theta} \\
1 & \text{if } V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w}) \text{ and } \bar{\theta} \leq \theta_i < \theta_{-i} \\
\frac{1}{2} & \text{if } V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w}) \text{ and } \theta_i = \theta_{-i} \\
\frac{1}{2} & \text{if } V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w}) \text{ and } \theta_{-i} < \bar{\theta} < \theta_i \\
\frac{1}{2} & \text{if } V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w}) \text{ and } \theta_i < \bar{\theta} < \theta_{-i} \\
0 & \text{if } V(\theta_i, \tau_i; \bar{w}) < V(\theta_{-i}, \tau_{-i}; \bar{w}) \\
0 & \text{if } V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w}) \text{ and } \theta_i < \theta_{-i} \leq \bar{\theta} \\
0 & \text{if } V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w}) \text{ and } \bar{\theta} \leq \theta_{-i} < \theta_i.
\end{cases}
\]
In order to properly define the payoffs in the selection game to be analyzed below, it is necessary to analyze the outcome when nobody chooses to run for office. Suppose there are no candidates for office and the “anarchy” regime prevails, i.e., \((\theta, \tau) = (1, 0)\). The problem
to be considered is the one including the option of home production. The following result
obtains.

**Proposition 7 (Anarchy).** Given the distribution $F$, in the anarchy equilibrium, there is a
weight $w^a \in [0, 1]$ such that $w \in \Omega^c$ for all $w \leq w^a$ and $w \notin \Omega^c$ for all $w > w^a$. It is characterized
by $p = 1 - \alpha$, $w^a = F^{-1}(1 - \alpha)$, and $\Xi \neq \emptyset$, and the payoffs are given by $V^a : [0, 1] \to [0, \alpha]$,

$$V^a(w) = \begin{cases} \alpha w^a & \text{if } w \leq w^a, \\ \alpha w & \text{if } w > w^a. \end{cases}$$

**Proof.** First, all sets $\Omega$, $\Omega^c$, and $\Xi$ are nonempty. Clearly, $0 \in \Omega^c$, since $q \in (1, 0)$ so that, by
assumption, $0$ chooses appropriation over both production and home production. Thus, $\Omega^c \neq \emptyset$. Suppose that
$\Xi = \emptyset$, i.e., $\chi^\prime_{w^a} = 0$ for all $w \in [0, 1]$. Then, by the same argument as before, there exists a weight $w^a$
such that $w \in \Omega^c$ for all $w \leq w^a$, $w \in \Omega$ for all $w > w^a$, and $(1 - p)w^a = q \int_{w^a}^1 \frac{w f(w)}{1 - F(w)} dw$ with $p = F(w^a)$ and $q = 1 - F(w^a)$,
so that $(1 - F(w^a))w^a = \int_{w^a}^1 w f(w) dw$. Rewriting yields $w^a - 1 + \int_{w^a}^1 F(w) dw = 0$. The left hand side is
$h(x; 1) = x - 1 + \int_{w^a}^1 F(w) dw$ as defined before. Noting that $h(0; 1) = \int_{w^a}^1 F(w) dw < 0$, $h(1; 1) = 0$, and
$h(x; 1) = 1 - F(x) > 0$ for all $x < 1$, it follows that $h(x; 1) = 0$ if and only if $x = 1$, i.e., $w^a = 1$. Thus, $\Omega^c = [0, 1]$
and $q = 0$, so that $q v_1 = 0 < \alpha w$ for all $w > 0$. That is, this cannot be an equilibrium since agent $w > 0$
did not choose his occupation optimally. Hence, $\Xi \neq \emptyset$. Now, suppose that $\Omega = \emptyset$. Then, $q = 0$
and thus $q v_1 = 0 < \alpha w$ for all $w > 0$. So, $\Omega^c = \emptyset$, since agent $0$ is indifferent and thus chooses to
appropriate by assumption, and $p = 0$, so that $\Omega = (0, 1]$, $\Xi = \emptyset$ yielding a contradiction. Thus, $\Omega \neq \emptyset$.
Next, assume that $1 - p > \alpha$. Then, $(1 - p)w > \alpha w$ for all $w \in [0, 1]$ so that $(0, 1] \cap \Xi = \emptyset$. Since $0 \in \Omega^c$, $\Xi = \emptyset$ which yields a contradiction. Suppose that $1 - p < \alpha$. Then, $(1 - p)w < \alpha w$ for all $w \in (0, 1]$ so that
$\Omega \cap (0, 1] = \emptyset$. Since $0 \in \Omega^c$, $\Omega = \emptyset$, which yields a contradiction. Therefore, $1 - p = \alpha$.

Next, define $w^a$ to satisfy $(1 - p)w^a = \alpha w^a = q v_1$. Consider any agent $w < w^a$. Then, $(1 - p)w = \alpha w <
(1 - p)w^a = q v_1$ and $w \in \Omega^c$. Consider any agent $w > w^a$. Then, $(1 - p)w = \alpha w > (1 - p)w^a = q v_1$ and
$w \notin \Omega^c$. It follows that, if $w \leq w^a$, then $w \in \Omega^c$ and $V^a(w) = q v_1 = (1 - p)w^a = \alpha w^a$ while, if $w > w^a$,
en $w \in (\Omega \cup \Xi)$ and $V^a(w) = (1 - p)w = \alpha w$. Finally, $\Omega^c = [0, w^a]$ and $\omega^c = F(w^a)$. Since $1 - \alpha = p = \omega^c$, it follows that $w^a = F^{-1}(1 - \alpha)$.

Q.E.D.

That is, in the anarchy equilibrium, there is an interval $[0, w^a]$ of agents that choose to be
appropriators. Agents with a skill greater than $w^a$ are distributed between production and
home production so that the probability of being expropriated is such that they are indifferent
between being producers or home producers. All agents get a payoff less than or equal to $\alpha$,
strictly smaller when the skill is less than $1$. Let $W^a = W(1, 0)$ denote welfare under anarchy.
Then, it is given by $W^a = \alpha \left(1 - \int_{w^a}^1 F(w) dw\right)$.

**C.2 A dictator**

Similarly, the dictator outcome needs to be analyzed. Suppose for the moment that, in the
beginning of the period, only one agent selects himself into running. Then this agent becomes
a dictator and maximizes his payoff by choosing $(\theta, \tau)$. Denote his skill by $w_D \in [0, 1]$. He
has to observe a participation constraint that simplifies to $(1 - \theta F(w^a(\theta)))(1 - \tau) \geq \alpha$. If
Proof. By lemma 2, the unique solution to the dictator’s problem solves

\(1 - \theta F(w^*(\theta))) (1 - \tau) < \alpha\), then all agents prefer producing at home over producing in the market. Observing the constraint ensures positive production.\(^{37}\) Thus, the dictator solves problem (P) with \(\bar{\varphi} = \alpha\). Let \((\theta_D, \tau_D)\) denote the solution and let \(w^d = w^*(\theta_D)\).

**Proposition 8** (Dictatorship). Given \(\alpha \in (0, 1)\), and the distribution \(F\), a unique solution \((\theta_D, \tau_D)\) exists and solves

\[
\begin{align*}
\zeta_1(\theta_D) &= \zeta_2(\theta_D) \\
\tau_D &= 1 - \alpha(1 - F(w^*(\theta_D)))^{-1},
\end{align*}
\]

where

\[
\zeta_1(\theta) = -w^*(\theta)f(w^*(\theta))w'^*(\theta) - g'(\theta) \quad \text{and} \quad \zeta_2(\theta) = \frac{\alpha \theta^{-1} w^*(\theta) F(w^*(\theta))}{(1 - F(w^*(\theta))) \theta}.
\]

\(\theta_D\) satisfies \(\theta_D < \bar{\theta}\). A higher value of \(\alpha\) improves both institutions and taxpayers’ welfare. Moreover, payoffs are given by \(V^d : [0, 1] \rightarrow [0, \alpha]\),

\[
V^d(w) = \begin{cases} 
\alpha w^d & \text{if } w \leq w^d, \\
\alpha w & \text{if } w > w^d.
\end{cases}
\]

Egalitarian welfare is given by \(W^d = \alpha \left(1 - \int_{w^d}^{1} F(w) \, dw\right)\). If \(\alpha \leq \frac{1}{2}\), then welfare is higher under anarchy than under dictatorship, i.e., \(W^a > W^d\).

**Proof.** By lemma 2, the unique solution to the dictator’s problem solves

\[
(1 - F(w^*(\theta))) \theta (1 - \tau) = \alpha
\]

\[-\tau w^*(\theta) f(w^*(\theta)) w'^*(\theta) - g'(\theta) = \theta^{-1} w^*(\theta) [F(w^*(\theta)) + (1 - F(w^*(\theta))) \theta + f(w^*(\theta)) w'^*(\theta)] (1 - \tau).\]

The first equation implies \(\tau(\theta; \alpha) = 1 - \frac{\alpha}{(1 - F(w^*(\theta))) \theta}\) and \(1 - \tau(\theta; \alpha) = \frac{\alpha}{(1 - F(w^*(\theta))) \theta}\). So that the second equation can be rewritten to

\[
-\left(1 - F(w^*(\theta)) \frac{\theta - \alpha}{(1 - F(w^*(\theta))) \theta} w^*(\theta) f(w^*(\theta)) w'^*(\theta) - g'(\theta)
\]

\[= \theta^{-1} w^*(\theta) [F(w^*(\theta)) + (1 - F(w^*(\theta))) \theta + f(w^*(\theta)) w'^*(\theta)] \frac{\alpha}{(1 - F(w^*(\theta))) \theta}
\]

\(^{37}\)Here, the tie breaking rule makes it necessary to require \(\alpha > 0\). Suppose \(\alpha = 0\). Then, the participation constraint reads \((1 - \theta F(w^*(\theta))) (1 - \tau) \geq 0\) and is satisfied trivially. If the constraint holds with equality, then nobody produces since \(q(\bar{\varphi}) \geq 0\) and, by assumption, if indifferent between production and appropriation, agents choose appropriation. So, the constraint needs to be slack for production of appropriable resources to take place. That is, the participation constraint actually is \((1 - \theta F(w^*(\theta))) (1 - \tau) > 0\). However, for any \(\epsilon > 0\), if \((1 - \theta F(w^*(\theta))) (1 - \tau) = \epsilon\), then increasing the tax \(\tau\) slightly such that the strict inequality still holds would increase the in-office payoff. Thus, a solution does not exist.
or

\begin{equation}
-w^*(\theta_D)f(w^*(\theta_D))w'^*(\theta_D) - g'(\theta_D) = \frac{\alpha\theta_D^{-1}w^*(\theta_D)F(w^*(\theta_D))}{(1-F(w^*(\theta_D))\theta_D)}.
\end{equation}

To simplify notation, define

\begin{align*}
\zeta_1(\theta) &= -w^*(\theta_D)f(w^*(\theta_D))w'^*(\theta_D) - g'(\theta_D) \\
\zeta_2(\theta) &= \frac{\alpha\theta_D^{-1}w^*(\theta_D)F(w^*(\theta_D))}{(1-F(w^*(\theta_D))\theta_D)}.
\end{align*}

Notice that, given \( w_D \), \( \zeta_1(\theta) \geq 0 \) for all \( \theta \leq \hat{\theta}(1) \), strictly so if \( \theta < \hat{\theta}(1) \), and \( \zeta_1(\theta) < 0 \) for all \( \theta > \hat{\theta}(1) \). It is strictly decreasing for all \( \theta < \hat{\theta}(1) \). As to \( \zeta_2 \), the denominator is decreasing in \( \theta \), while the nominator is increasing in \( \theta \). Thus, \( \zeta_2(\theta) > 0 \) for all \( \theta \in (0,1) \) and is strictly increasing in \( \theta \). This implies that there is a unique intersection of \( \zeta_1(\theta) \) and \( \zeta_2(\theta) \) at some \( \theta < \hat{\theta}(1) \). Denote it by \( \theta_D \). Given that \( \theta_D \) is unique, so is \( \tau_D = \tau(\theta_D; \alpha) = 1 - \frac{\alpha}{1-F(w^*(\theta_D))\theta_D} \).

The first order conditions imply that \( (1-F(w^*(\theta_D))\theta_D)(1-\tau_D) = \alpha \). Obviously, a higher \( \alpha \) increases expected payoffs for tax payers. As to enforcement, \( \frac{\partial \zeta_1(\theta)}{\partial \alpha} = 0 \) while \( \frac{\partial \zeta_2(\theta)}{\partial \alpha} > 0 \) whenever \( \theta > 0 \) so that \( \theta_D \) decreases with \( \alpha \).

If \( w \leq w^d \), then \( w \) is an appropriator and gets \( V^d(w) = \theta_D(1-\tau_D)\int_{w^d}^1 dw f(w)dw = (1-\tau_D)(1-F(w^*(\theta_D))\theta_D)w = \alpha w^d \). If \( w > w^d \), then \( w \) is a producer and gets \( V^d(w) = (1-\tau_D)(1-F(w^*(\theta_D))\theta_D)w = \alpha w \).

Welfare is defined as before so that \( W^d = \alpha \left(1-\int_{w^d}^1 dw f(w)dw\right) \). If \( \alpha \leq \frac{1}{2} \), then \( w^a \geq \bar{w} > w^d \), while again \( \alpha \left(1-\int_{w^d}^1 dw f(w)dw\right) \) is strictly increasing in \( x \). So \( W^a > W^d \).

The condition \( \alpha \leq \frac{1}{2} \) is sufficient for the welfare comparison result. Since I assume that \( \alpha \) is small, generically, anarchy provides for higher welfare than dictatorship. Figure 4 depicts the welfare function and compares welfare under anarchy and dictatorship. Panel 4(a) plots the value of the egalitarian welfare function for all combinations \( (\theta, \tau) \). The doted line depicts the \( (\theta, \tau) \)-realizations under dictatorship as functions of the value \( \alpha \) of the outside option. A better outside option, a higher \( \alpha \), increases welfare. Panel 4(b) compares welfare under anarchy and dictatorship depending on \( \alpha \). Under dictatorship, when \( \alpha = 1 \), welfare is greater than 0.5. This derives from the fact that the tax would have to be a subsidy to ensure participation in this case (see appendix D). Clearly, no dictator would ever choose to pay both the cost for enforcement and a subsidy. In fact, this is not feasible.

**D A simple example economy**

This section lays out the details for an example economy. Assume that \( F \) is uniform over \([0,1]\) so that \( F(w) = w \) and \( f(w) = 1 \) and that the cost function is given by \( g(\theta) = 0.01 \left(1+\theta^{-\frac{3}{2}}\right) \) when \( \theta < 1 \) and \( g(1) = 0 \). That is, there is a fixed cost of 0.02. Figure 5 depicts the class of cost functions \( g \) belongs to. Notice that \( \bar{w} = \frac{1}{2} \) and \( \bar{\theta} = \bar{w}(1-\int_{\bar{w}}^1 F(w)dw)^{-1} = \frac{1}{2}(1-\int_{\frac{1}{2}}^1 w dw)^{-1} = \frac{4}{9} \).
Claim 1. \(F\) and \(g\) jointly satisfy assumption 2.

Proof. \(F\) has to satisfy \(\left(\int_0^1 w f(w)dw\right)^2 \leq \bar{w}^2 f(\bar{w}) \left(1 - \int_0^1 F(w)dw\right)\) which due to \(F\) being uniform on \([0, 1]\) simplifies to \(\left(\int_0^1 wdw\right)^2 \leq \frac{1}{4} \left(1 - \int_0^1 wdw\right)\) or \(\frac{3}{4} \leq 5\) which holds true. Moreover, \(f\) satisfies equation (16) of condition 1. Next, \(g\) is strictly decreasing and strictly convex on the interior of its domain. Additionally, \(g\) has to satisfy \(-g'(\bar{\theta})/g(\bar{\theta}) \leq 1\) and \(-g''(\bar{\theta})/g'((\bar{\theta}) \geq \frac{2\bar{\theta} f(\bar{\theta})}{(1-\frac{1}{2}\bar{\theta})^2}\) for all \(\theta < \bar{\theta}\), where \(\bar{\theta} = \frac{\int_0^1 \bar{w} f(\bar{w})dw}{\int_0^1 F(w)dw}\). Thus, these can be written as \(-g'(\frac{1}{5})/\frac{1}{5} \leq g(\frac{1}{5})\) and \(-g''(\bar{\theta})/g'((\bar{\theta}) \geq \frac{20}{9}\). In general, consider the family of functions given by \(g(\theta) = a(b + \theta^{-c})\) parameterized by \((a, b, c)\), where \(a\) simply scales the image and let \(d > 0\). Then, for the conditions to hold, \((a, b, c)\) has to satisfy \(ca^{-1} \leq a(b + \bar{\theta}^{-c})\) if \(b \geq c - 1\) and \(\frac{e(\theta + 1)}{ca^{-1}\theta^{-c-1}} \geq d\) if \(c \geq d - 1\). Now, letting \(d = \frac{20}{9}\), \(c = \frac{3}{2} \geq \frac{14}{9} = d - 1\) and \(b = 1 \geq \frac{5}{3} \approx 0.7\) are satisfied. Q.E.D.
The underlying economy given $(\theta, \tau)$ The function $h$ is given by $h(x; \theta) = \theta^{-1}x - 1 + \int_x^1 wd\omega = \frac{1}{2}(2\theta^{-1}x - 1 - x^2)$. Thus, given $\theta \in [0, 1]$, $w^*(\theta)$ solves $x^2 - 2\theta^{-1}x + 1 = 0$ and, since $w^*(\theta) \in [0, 1]$, we have

$$w^*(\theta) = \theta^{-1} - (\theta^{-2} - 1)^{\frac{1}{2}}.$$  

The implied payoff functions are

$$\varphi(\theta, \tau) = (1 - \tau)(1 - w^*(\theta)\theta) = (1 - \tau)(1 - \theta^2)^{\frac{1}{2}},$$

$$\nu(\theta, \tau) = (1 - \tau)\theta \int_{w^*(\theta)}^1 wd\omega = (1 - \tau)\frac{1}{2}\theta(1 - w^*(\theta)^2) = (1 - \tau)[(\theta^{-2} - 1)^{\frac{1}{2}} - \theta(\theta^{-2} - 1)]$$

$$V(\theta, \tau; w') = (1 - \tau)\max\{\varphi(\theta, 0)w', \nu(\theta, 0)\}$$

$$\tilde{w}(\theta, \tau) = \tau \int_{w^*(\theta)}^1 wd\omega - g(\theta) = \frac{1}{2}\tau(1 - w^*(\theta)^2) - 0.01\left(1 + \theta^{-\frac{3}{2}}\right).$$

The economy’s output is given by

$$y(\theta) = \int_{w^*(\theta)}^1 wd\omega = \frac{1}{2}(1 - w^*(\theta)^2).$$

The egalitarian welfare function for generic citizens is

$$W(\theta, \tau) = \varphi(\theta, \tau)\left(1 - \int_{w^*(\theta)}^1 wd\omega\right) = (1 - \tau)[1 - \theta^{-2} + \theta^{-1}(\theta^{-2} - 1)^{\frac{1}{2}}].$$

In case of anarchy, $w^a = 1 - \alpha$ and welfare is given by

$$W^a(\alpha) = \alpha\left(1 - \int_{1-\alpha}^1 wd\omega\right) = \frac{1}{2}\alpha(1 - (1 - \alpha)^2).$$

In case of dictatorship, $(\theta_D, \tau_D)$ solves the equations

$$(1 + \alpha)w^*(\theta)^2 = \frac{3}{200}\theta^{-\frac{5}{2}}\theta(1 - w^*(\theta)\theta)$$

$$\tau_D = 1 - \alpha(1 - w^*(\theta_D)\theta_D)^{-1}$$

and welfare is

$$W^d = (1 - \tau_D)[1 - \theta_D^{-2} + \theta_D^{-1}(\theta_D^{-2} - 1)^{\frac{1}{2}}].$$
Note that, when $\alpha = 1$ (or close enough to 1), the tax has to be a subsidy to ensure participation. Despite not being optimal for a dictator, this case is infeasible.

**The political game given $w_L$ and $w_H$** The pooling outcome $(\theta_p, \tau_p)$ and $w_p$ solves the system of equations

$$
\Psi_1(\theta) = \Psi_2(\theta) \\
w_p = w^*(\theta_p) \\
\tau_p = \frac{\theta_p \frac{1}{2} (1 - w_p^2) + 0.01 \left(1 + \theta_p^{-2}\right)}{(1 + \theta_p) \frac{1}{2} (1 - w_p^2)}
$$

where

$$
\Psi_1(\theta) = \frac{1}{2} (1 - w^*(\theta))^2 - 0.01 \left(1 + \theta^{-2}\right) \\
\Psi_2(\theta) = \frac{\left(\frac{-w^*(\theta)^2}{\theta (1 - w^*(\theta))^2} + \frac{3}{200} \theta^{-\frac{5}{2}}\right) (1 + \theta) \frac{1}{2} (1 - w^*(\theta)^2)}{\theta^{-1} w^*(\theta)^2}
$$

Given any $z$, the separating outcome $(\theta_L, \tau_L)$ solves the system

$$
\psi_1(\theta; z) = \psi_2(\theta; z) \\
\tau_L = \frac{(1 - w^*(\theta_L)\theta_L) z + 0.01 \left(1 + \theta_L^{-2}\right)}{(1 - w^*(\theta_L)\theta_L) z + \frac{1}{2} (1 - w^*(\theta_L)^2)}
$$

where

$$
\psi_1(\theta) = \Psi_1(\theta) \\
\psi_2(\theta) = \frac{\left(\frac{-w^*(\theta)^2}{\theta (1 - w^*(\theta))^2} + \frac{3}{200} \theta^{-\frac{5}{2}}\right) \left(\frac{1}{2} (1 - w^*(\theta)^2) + (1 - w^*(\theta)_\theta) z\right)}{\theta^{-1} w^*(\theta)^2}
$$

Finally, the enforcement implemented is given by

$$
\theta^*(z) = \begin{cases} 
\theta_p & \text{if } z \leq w_p \\
\theta_L(z) & \text{if } z > w_p.
\end{cases}
$$

**E Proofs**

This section provides the proofs of the results in the text. It is organized in the same way as the analysis in section 3.
E.1 The underlying economy given \((\theta, \tau)\)

E.1.1 Equilibrium in the underlying economy given \((\theta, \tau)\)

**Proposition 1**

\[ E.1 \] The underlying economy given \((\theta, \tau)\)

**Proof.** Fix \(\theta > 0\) and let \(F\) be continuous. Then, \(h(x; \theta)\) is continuous and \(h(0; \theta) = \int_0^1 F(w)dw - 1 < 0\) while \(h(1; \theta) = \theta^{-1} - 1 \geq 0\) and strictly so if \(\theta < 1\). By the intermediate value theorem, there is a \(w^* \in (0,1)\), such that \(h(w^*; \theta) = 0\). \(h(x; \theta) = \theta^{-1} - F(x) \geq 0\) and strictly so if \(\theta < 1\) or \(x < 1\). Hence, \(w^*\) is unique.

Next, the assumptions imply that \(h\) is continuously differentiable on \((0,1)^2\). Let \(h_i\) and \(w^*_i\) be the functions \(h\) and \(w^*\) derived from the underlying cumulative distribution function \(F = F_i\).

1. By proposition 1, for all \(\theta > 0\), there is a unique \(w^*(\theta) \in (0,1)\), such that \(h(w^*(\theta), \theta) = 0\). Since \(h_x > 0\) and \(h_\theta < 0\) for all \((x, \theta) \in (0,1)^2\), the assumptions of the implicit function theorem are satisfied at each \((w^*), \theta)\). Thus, \(w^*\) is continuously differentiable on \((0,1)\) and \(w''(\theta) = \frac{\partial w^*}{\partial \theta} = \frac{\partial h}{\partial \theta}(x; \theta)(h_x(x; \theta))^{-1} \mid_{x=w^*} = -\theta^2 F(w^*)^{-1}w^*(\theta)\)

From (4), it holds that \(w^*(0) = 0\). For \(\theta = 1\), we have that \(h(0; 1) = \int_0^1 F(w)dw - 1 < 0\), \(h(1; 1) = 0\), and \(h_x(x; 1) = 1 - F(x) > 0\) for all \(x < 1\). Hence, \(w^*(1) = 1\), as claimed.

2. Since \(F_2\) is a mean preserving spread of \(F_1\), \(\int_0^1 F_1(w)dw = \int_0^1 F_2(w)dw = \int_0^k F_1(w)dw \leq \int_0^k F_2(w)dw\) for all \(k \in [0, 1]\) which implies \(\int_0^1 F_1(w)dw \geq \int_1^k F_2(w)dw\) for all \(k \in [0, 1]\). Then, \(h_1(x; \theta) - h_2(x; \theta) = \int_1^x F_1(w)dw - \int_1^x F_2(w)dw \geq 0\).

3. Since \(F_2\) first order stochastically dominates \(F_1\), \(F_1(w) \geq F_2(w)\) for all \(w \in [0, 1]\) which directly implies \(h_1(x; \theta) - h_2(x; \theta) = \int_1^x (F_1(w) - F_2(w))dw \geq 0\).

This completes the proof. Q.E.D.

E.2 The political game given \(w_L\) and \(w_H\)

E.2.1 Strategies, payoffs, and equilibrium definition

I first report some intermediate results that are helpful in the proofs below.

**Lemma 2.** Problem (P) has a unique solution \((\theta, \tau)\) that solves the system of two equations in two unknowns given by

\[
(1 - F(w^*(\theta))\theta)(1 - \tau) = \tilde{\varphi} \\
-\tau w^*(\theta)f(w^*(\theta)) w''(\theta) - g'(\theta) = \theta^{-1} w^*(\theta) F(w^*(\theta)) + \theta f(w^*(\theta)) w''(\theta) (1 - \tau).
\]

**Proof.** By assumption, both \(\tilde{w}(\theta)\) and \(\varphi(\theta, \tau)\) are continuous and strictly quasiconcave in \((\theta, \tau)\). The constraint set \(\{(\theta, \tau): \varphi(\theta, \tau) \geq \tilde{\varphi}\}\) is a compact and convex subset of \(\mathbb{R}^2\). Slater’s condition is satisfied whenever \(\tilde{\varphi} < 1\). Thus, by the Kuhn-Tucker Theorem, the necessary and sufficient conditions for the unique solution are
Given by

\[
\int_{w^*}^{1} w f(w) dw - \lambda (1 - F(w^*(\theta)) \theta) = 0,
\]

implies that \( \lambda = (1 - F(w^*(\theta)) \theta)^{-1} \int_{w^*}^{1} w f(w) dw = \theta^{-1} w^*(\theta) > 0 \). Combining gives the system of equations.

Q.E.D.

**Lemma 3 (Payoffs).** The payoffs in the different occupations satisfy the following.

1. Given any tax \( \tau \in (0, 1) \), there exists a \( \hat{\theta}(\tau) \in [0, 1] \), such that the office holder’s payoff increases in \( \theta \) whenever \( \theta < \hat{\theta}(\tau) \) and decreases in \( \theta \) whenever \( \theta > \hat{\theta}(\tau) \). If \( \bar{w} > 0 \), then \( \hat{\theta}(\tau) < \bar{\theta} \). Moreover, \( \hat{\theta}_\tau(\tau) < 0 \).

2. Given any \( \tau \in (0, 1) \), there exists a \( \hat{\theta} \in [0, \bar{\theta}] \), such that an appropriator’s payoff increases in \( \theta \) whenever \( \theta < \hat{\theta} \) and decreases in \( \theta \) whenever \( \theta > \hat{\theta} \).

3. Any producer’s payoff is strictly decreasing in both \( \theta \) and \( \tau \).

**Proof.** 1. Given any \( \tau \in (0, 1) \), \( \bar{w} \) as defined by (8) is strictly quasiconcave in \( \theta \). Thus, the optimization problem \( \max_{\theta \in [0, 1]} \int_{w^*(\theta)}^{1} w f(w) dw - g(\theta) \) has a unique solution. That is, one can define \( \hat{\theta} = \arg \max_{\theta \in [0, 1]} \int_{w^*(\theta)}^{1} w f(w) dw - g(\theta) \). Then, \( \hat{\theta} \) satisfies \( \tau w^*(\hat{\theta})^2 f(w^*(\hat{\theta})) \hat{\theta}(1 - \hat{\theta}F(w^*(\hat{\theta})))^{-1} = -g'((\hat{\theta})) \). In order to show that \( \theta < \hat{\theta} \), it has to hold that the first order condition evaluated at \( \theta \) is negative, i.e., \( \tau \bar{w}^2 f(\bar{w}) \hat{\theta}^{-1} [1 - \bar{\theta}^2]^{-1} > -g'(\bar{\theta}) \). Since \( \bar{w} > 0 \), \( \tau > g(\bar{\theta})(\int_{w^*}^{1} w f(w) dw)^{-1} \) has to hold. Then, it is sufficient to show that \( g(\bar{\theta})(\int_{w^*}^{1} w f(w) dw)^{-1} \bar{w}^2 f(\bar{w}) [1 - \bar{\theta}^2]^{-1} \geq -g'(\bar{\theta}) \). Since \( -g'(\bar{\theta}) \hat{\theta} / g(\bar{\theta}) \leq 1 \), it is sufficient to show that \( (\int_{w^*}^{1} w f(w) dw)^{-1} \bar{w}^2 f(\bar{w}) [1 - \bar{\theta}^2]^{-1} \geq 1 \). That is, \( \bar{w}^2 f(\bar{w}) \geq (\int_{w^*}^{1} w f(w) dw)[1 - \bar{\theta}^2]^{-1} \). Using the definition of \( \hat{\theta} \), we have \( \hat{\theta}^2 f(\hat{\theta}) = (\int_{w^*}^{1} w f(w) dw)[1 - \bar{\theta}^2]^{-1} \). Using the definition of \( \hat{\theta} \), we have \( \hat{\theta}^2 f(\hat{\theta}) = (\int_{w^*}^{1} w f(w) dw)[1 - \bar{\theta}^2]^{-1} \). By integration by parts, \( \int_{w^*}^{1} w f(w) dw = 1 - \frac{1}{\bar{w}} \int_{w^*}^{1} f(w) dw \). Then, assumption 2 establishes the first part of the result. For the second part, rewrite the first order condition as \( \tau w^*(\hat{\theta}) f(w^*(\hat{\theta})) w^*(\hat{\theta}) = -g'(\bar{\theta}) \). This equation implicitly defines a well-behaved function \( \hat{\theta} \) with argument \( \tau \). Since \( w^*(\hat{\theta}) > 0 \), \( w^*(\hat{\theta}) \) > 0, the distribution is unimodal, the mode greater than or equal to the median, and as shown, \( w^*(\hat{\theta}) \leq \bar{w} \), the left-hand side of this expression (weakly) increases in \( \hat{\theta} \). Since \( g''(\bar{\theta}) > 0 \), \(-g'(\bar{\theta}) \) decreases in \( \hat{\theta} \). Thus, an increase in \( \tau \) a decrease in \( \hat{\theta} \) for this condition to be satisfied.

2. Given any \( \tau \in (0, 1) \), the function \( \nu(\theta, \tau) = (1 - \tau) \theta \int_{w^*}^{1} w f(w) dw \) is strictly quasiconcave in \( \theta \). Thus, the optimization problem \( \max_{\theta \in [0, 1]} (1 - \tau) \theta \int_{w^*}^{1} w f(w) dw = w^*(\theta)^2 f(w^*(\theta)) \). Suppose for a contradiction that \( \hat{\theta} > \bar{\theta} \). Then, the first order condition evaluated at \( \hat{\theta} \) satisfies \( [1 - F(w^*(\hat{\theta})) \hat{\theta}] \int_{w^*}^{1} w f(w) dw > w^*(\hat{\theta})^2 f(w^*(\hat{\theta})) \) or \( [1 - \frac{1}{2} \hat{\theta}] \int_{w^*}^{1} w f(w) dw > \bar{w}^2 f(\bar{w}) \). Using the fact that, by integration by parts, \( \int_{w^*}^{1} w f(w) dw = 1 - \frac{1}{\bar{w}} \int_{w^*}^{1} f(w) dw \), this expression can be rewritten to yield \( \left( \int_{w^*}^{1} w f(w) dw \right)^2 > \bar{w}^2 f(\bar{w}) \left( 1 - \int_{w^*}^{1} f(w) dw \right) \). This contradicts assumption 2 completing the argument.
3. Given any \((\theta, \tau) \in [0, 1]^2\), producer \(i\)'s payoff is given by \((1 - F(w^*(\theta))\theta)(1 - \tau)w_i\), where both \(F\) and \(w^*\) are strictly increasing in their arguments.

Q.E.D.

E.2.2 Equilibrium of the political game given \(w_L\) and \(w_H\)

**Proposition 2**

First, a few helpful intermediate results are provided.

**Lemma 4** (Voting behavior). Voters' behavior can be summarized as follows.

1. Given any set of proposals \((\theta_i, \tau_i)\) and \((\theta_{-i}, \tau_{-i})\), if any one producer prefers \((\theta_i, \tau_i)\) over \((\theta_{-i}, \tau_{-i})\), then so do all other producers. Similarly, if any one appropriator prefers \((\theta_i, \tau_i)\) over \((\theta_{-i}, \tau_{-i})\), then so do all other appropriators.

2. Assume the proposals are given by \((\theta_i, \tau_i)\) and \((\theta_{-i}, \tau_{-i})\). Consider any agent \(i\) with productivity \(w\) and assume that he strictly prefers \((\theta_i, \tau_i)\) over \((\theta_{-i}, \tau_{-i})\). If he is a producer under \((\theta_i, \tau_i)\), then all agents with higher productivity also prefer \((\theta_i, \tau_i)\), i.e., if \(w > w^*(\theta_i)\) and \(V(\theta_i, \tau_i; w) > V(\theta_{-i}, \tau_{-i}; w)\), then \(V(\theta_i, \tau_i; w') > V(\theta_{-i}, \tau_{-i}; w')\) for all \(w' > w\). Similarly, if he is an appropriator under \((\theta_i, \tau_i)\), then all agents with lower productivity also prefer \((\theta_i, \tau_i)\), i.e., if \(w \leq w^*(\theta_i)\) and \(V(\theta_i, \tau_i; w) > V(\theta_{-i}, \tau_{-i}; w)\), then \(V(\theta_i, \tau_i; w') > V(\theta_{-i}, \tau_{-i}; w')\) for all \(w' < w\).

3. For any \((\theta, \tau) \in \{(\theta_L, \tau_L), (\theta_H, \tau_H)\}\), if agents \(w\) and \(w'\) with \(w < w'\) both vote for it, then so does any agent with \(w'' < w\).

**Proof.**

1. Suppose there is a \(w\) such that \((1 - F(w^*(\theta_i))\theta_i)(1 - \tau_i)w > (1 - F(w^*(\theta_{-i}))\theta_{-i})(1 - \tau_{-i})w\). Then, this holds for all \(w \in (0, 1]\). Similarly, if there is one \(w'\) such that \(\theta_i(1 - \tau_i)\int_{w'} w f(w)dw > \theta_{-i}(1 - \tau_{-i})\int_{w'} w f(w)dw\), then this holds for all \(w' \in [0, 1]\).

2. Suppose \(V(\theta_i, \tau_i; w') > V(\theta_{-i}, \tau_{-i}; w')\). There are two cases. If \(w' > w^*(\theta_i)\), then it has to hold that \((1 - F(w^*(\theta_i))\theta_i)(1 - \tau_i)w' \geq \max\{\theta_i(1 - \tau_i)\int_{w'} w f(w)dw, \max\{(1 - F(w^*(\theta_{-i}))\theta_{-i})(1 - \tau_{-i})w', \theta_{-i}(1 - \tau_{-i})\int_{w'} w f(w)dw\}\}, which thus holds for all \(w'' > w'\). Similarly, if \(w' \leq w^*(\theta_i)\), then it implies that \(\theta_i(1 - \tau_i)\int_{w'} w f(w)dw \geq \max\{(1 - F(w^*(\theta_i))\theta_i)(1 - \tau_i)w', \max\{(1 - F(w^*(\theta_{-i}))\theta_{-i})(1 - \tau_{-i})w', \theta_{-i}(1 - \tau_{-i})\int_{w'} w f(w)dw\}\}. This holds for all \(w'' < w'\).

3. Without loss of generality, assume that \(w\) and \(w'\) vote for \((\theta_L, \tau_L)\). This implies that \(V(\theta_L, \tau_L; w') > V(\theta_H, \tau_H; w)\) and \(V(\theta_L, \tau_L; w') > V(\theta_H, \tau_H; w')\). If \(w^*(\theta_L) < w\), then by lemma 2, \(V(\theta_L, \tau_L; w'') > V(\theta_H, \tau_H; w'')\) for all \(w'' > w\) and thus for all \(w'' \in (w, w')\). Similarly, if \(w^*(\theta_L) > w'\), again lemma 2 yields the result. If \(w^*(\theta_L) \in (w, w')\), then there are at least one appropriator and at least one producer that prefer \((\theta_L, \tau_L)\) over \((\theta_H, \tau_H)\) and the result obtains by lemma 1.

Q.E.D.

This lemma can now be used in the proof of a kind of median voter result. Let \(\varphi_i = (1 - \tau_{-i})(1 - F(w^*(\theta_{-i}))\theta_{-i})\) and let \(\hat{w}^*(\varphi_i)\) denote the value of problem (P) given \(\hat{\varphi} = \varphi_i\). If \((\theta_i, \tau_i) = (\theta_{-i}, \tau_{-i})\), then the proposals are said to be pooled.
Lemma 5 (The median voter and the winner). Suppose that voters face any two proposals \((\theta_i, \tau_i)\) and \((\theta_{-i}, \tau_{-i})\). If \(V(\theta_i, \tau_i; w) > V(\theta_{-i}, \tau_{-i}; \bar{w})\), then \((\theta_i, \tau_i)\) wins the election with probability 1. Suppose \(V(\theta_i, \tau_i; w) = V(\theta_{-i}, \tau_{-i}; \bar{w})\). If \(\theta_i < \bar{\theta} < \theta_{-i}\), then \((\theta_i, \tau_i)\) wins the election with probability \(\frac{1}{2}\). Furthermore:

1. Suppose that either \(\epsilon = 0\) or \(\tilde{w}^*(\phi_i) \geq V(\theta_{-i}, \tau_{-i}; w_i)\) for all \(i \in \{L, H\}\) or \(\tilde{w}^*(\phi_i) < V(\theta_{-i}, \tau_{-i}; w_i)\) for all \(i \in \{L, H\}\). If \(\theta_i = \theta_{-i}\), then \((\theta_i, \tau_i)\) wins the election with probability \(\frac{1}{2}\). If \(\bar{\theta} \geq \theta_i > \theta_{-i}\) or \(\bar{\theta} \leq \theta_i < \theta_{-i}\), then \((\theta_i, \tau_i)\) wins the election with probability 1.

2. Suppose that \(\epsilon > 0\) and \(\tilde{w}^*(\phi_i) < V(\theta_{-i}, \tau_{-i}; w_i)\) and \(\tilde{w}^*(\phi_{-i}) \geq V(\theta_i, \tau_i; w_{-i})\). If \(\theta_i = \theta_{-i}\), then \((\theta_i, \tau_i)\) wins the election with probability \(\frac{1}{2}(1 + \epsilon)\). If \(\bar{\theta} \geq \theta_i > \theta_{-i}\) or \(\bar{\theta} \leq \theta_i < \theta_{-i}\), then \((\theta_i, \tau_i)\) wins the election with probability 1.

3. Suppose that \(\epsilon > 0\) and \(\tilde{w}^*(\phi_i) \geq V(\theta_{-i}, \tau_{-i}; w_i)\) and \(\tilde{w}^*(\phi_{-i}) < V(\theta_i, \tau_i; w_{-i})\). If \(\theta_i = \theta_{-i}\), then \((\theta_i, \tau_i)\) wins the election with probability \(\frac{1}{2}(1 - \epsilon)\). If \(\bar{\theta} > \theta_i > \theta_{-i}\) or \(\bar{\theta} < \theta_i < \theta_{-i}\), then \((\theta_i, \tau_i)\) wins the election with probability \(1 - \frac{1}{2}\epsilon\).

\textbf{Proof.}\ First, notice that the preference shock can only matter when there is a positive measure of voters that is indifferent between the regimes proposed. This is due to the facts that it only affects voting decisions when agents are indifferent and a set of agents with measure zero does not affect the measure of the set of agents that vote for a particular regime.

First, suppose that \(V(\theta_i, \tau_i; \bar{w}) = V(\theta_{-i}, \tau_{-i}; \bar{w})\) and either \(\epsilon = 0\) or \(\tilde{w}^*(\phi_i) \geq V(\theta_{-i}, \tau_{-i}; w_i)\) for all \(i \in \{L, H\}\) or \(\tilde{w}^*(\phi_i) < V(\theta_{-i}, \tau_{-i}; w_i)\) for all \(i \in \{L, H\}\). That is, the preference shock is either impossible or does not matter.

Suppose that \(V(\theta_i, \tau_i; \bar{w}) > V(\theta_{-i}, \tau_{-i}; \bar{w})\). If \(\theta_i = \theta_{-i}\), then all agents choose the same occupations under either regime and \(\tau_i < \tau_{-i}\). All agents prefer the lower tax, so that all agents vote for \((\theta_i, \tau_i)\) which thus wins. If \(\theta_i > \theta_{-i}\), then there are three cases. Either \(\theta_{-i} < \theta_i < \bar{\theta}\), or \(\theta_{-i} < \bar{\theta} \leq \theta_i\), or \(\bar{\theta} \leq \theta_{-i} < \theta_i\). In the first case, the median agent would be a producer under either regime. Thus, \(V(\theta_i, \tau_i; \bar{w}) > V(\theta_{-i}, \tau_{-i}; \bar{w})\) implies that the payoff from being a producer is higher under \((\theta_i, \tau_i)\) than under \((\theta_{-i}, \tau_{-i})\). This implies that all agents that would be producers under either schedule vote for \((\theta_i, \tau_i)\). Since \(\theta_{-i} < \theta_i < \bar{\theta}\), it holds that all agents with skill greater than \(w^*(\theta_i) < \bar{w}\) and thus a measure \(1 - F(w^*(\theta_i)) > 1 - F(\bar{w}) = \frac{1}{2}\) vote for \((\theta_i, \tau_i)\) which thus wins.

In the second case, the median voter prefers to appropriate under \((\theta_i, \tau_i)\) (if \(\theta_i \leq \theta_{-i}\), the median voter is indifferent between occupations under that schedule) over producing under \((\theta_{-i}, \tau_{-i})\) which he prefers to appropriating under \((\theta_{-i}, \tau_{-i})\). Thus, the appropriation payoff under \((\theta_i, \tau_i)\) is greater than under \((\theta_{-i}, \tau_{-i})\). This implies that all agents with \(w \leq \bar{w}\) prefer schedule 1. If \(\theta_i = \bar{\theta}\), then also producing under \((\theta_i, \tau_i)\) yields higher payoff than under \((\theta_{-i}, \tau_{-i})\) implying that all agents prefer and vote for schedule 1 which thus wins. If \(\theta_i > \bar{\theta}\), then since \(V(\theta_i, \tau_i; \bar{w}) > V(\theta_{-i}, \tau_{-i}; \bar{w})\), there is an \(\epsilon > 0\) such that, for the agent with skill \(\bar{w} + \epsilon\), appropriating under 1 is still preferred to producing under 2 and \(V(\theta_i, \tau_i; \bar{w} + \epsilon) > V(\theta_{-i}, \tau_{-i}; \bar{w} + \epsilon)\). Then, the measure of agents voting for \((\theta_i, \tau_i)\) equals \(F(\bar{w} + \epsilon) > \frac{1}{2}\) and 1 wins. In the third case, the median voter prefers appropriation under \((\theta_i, \tau_i)\) over appropriation under \((\theta_{-i}, \tau_{-i})\) implying the payoffs from the former are greater than payoff from the latter. If \(\theta_{-i} > \bar{\theta}\), then all agents with \(w \leq w^*(\theta_i)\) prefer \((\theta_i, \tau_i)\) since they would be appropriators under either schedule. Then, \(F(w^*(\theta_{-i})) > F(\bar{w}) = \frac{1}{2}\) vote for \((\theta_i, \tau_i)\) which thus wins. If \(\theta_{-i} = \bar{\theta}\), then since \(V(\theta_i, \tau_i; \bar{w}) > V(\theta_{-i}, \tau_{-i}; \bar{w})\), there is an \(\epsilon > 0\) such that, for the agent with skill
\( \tilde{w} + \epsilon, \) appropriating under 1 is still preferred to producing under 2 and \( V(\theta_i, \tau; \tilde{w} + \epsilon) > V(\theta_{-i}, \tau_{-i}; \tilde{w} + \epsilon) \) so that a measure \( F(\tilde{w} + \epsilon) > \frac{1}{2} \) of agents votes for \((\theta_i, \tau_i)\) which thus wins. If \( \theta_i < \theta_{-i}, \) then there are three cases, \( \theta_i < \theta_{-i} \leq \tilde{\theta}, \theta_i \leq \tilde{\theta} < \theta_{-i}, \) or \( \tilde{\theta} < \theta_i < \theta_{-i}. \) In the first case, the median voter prefers to produce under \((\theta_i, \tau_i)\) over producing under \((\theta_{-i}, \tau_{-i})\). All agent with \( w > \tilde{w} \) thus prefer \((\theta_i, \tau_i)\), too, since they would be producers under either regime. If \( \theta_i < \tilde{\theta} \), then all agents with \( w \geq w^*(\theta_i) \) prefer \((\theta_i, \tau_i)\) so that a measure \( 1 - F(w^*(\theta_i)) > 1 - F(\tilde{w}) = \frac{1}{2} \) of agents vote for it and it wins. If \( \theta_{-i} = \tilde{\theta} \), then, since \( V(\theta_i, \tau_i; \tilde{w}) > V(\theta_{-i}, \tau_{-i}; \tilde{w}) \), there is an \( \epsilon > 0 \) such that \( V(\theta_i, \tau_i; \tilde{w} - \epsilon) > V(\theta_{-i}, \tau_{-i}; \tilde{w} - \epsilon) \). Thus a measure \( 1 - F(\tilde{w} - \epsilon) > 1 - F(\tilde{w}) = \frac{1}{2} \) vote for \((\theta_i, \tau_i)\) which thus wins. In the second case, the median voter prefers to produce under \((\theta_i, \tau_i)\) over appropriating under \((\theta_{-i}, \tau_{-i})\) which he prefers over producing under \((\theta_{-i}, \tau_{-i})\). This implies that, for any \( w \), producing under \((\theta_i, \tau_i)\) yields a higher payoff than producing under \((\theta_{-i}, \tau_{-i})\). So, all agents with skill \( w > \tilde{w} \) prefer \((\theta_i, \tau_i)\) independent of their occupations under either regime. If \( \theta_i = \tilde{\theta} \), then appropriation yields higher payoff under \((\theta_i, \tau_i)\) than it does under \((\theta_{-i}, \tau_{-i})\). Thus, all agents vote for \((\theta_i, \tau_i)\) which thus wins. If \( \theta_i < \tilde{\theta} \) then, since \( V(\theta_i, \tau_i; \tilde{w}) > V(\theta_{-i}, \tau_{-i}; \tilde{w}) \), there is an \( \epsilon > 0 \) such that \( V(\theta_i, \tau_i; \tilde{w}) - \epsilon > V(\theta_{-i}, \tau_{-i}; \tilde{w}) - \epsilon \). Thus a measure \( 1 - F(\tilde{w} - \epsilon) > 1 - F(\tilde{w}) = \frac{1}{2} \) vote for \((\theta_i, \tau_i)\) which thus wins. In the third case, the median voter prefers appropriation under \((\theta_i, \tau_i)\) over appropriation under \((\theta_{-i}, \tau_{-i})\). For all agents with skill \( w \in (w^*(\theta_i), w^*(\theta_{-i})) \) the payoff from production under \((\theta_i, \tau_i)\) is greater than the payoff from appropriation under \((\theta_i, \tau_i)\) which is greater than the payoff from appropriation under \((\theta_{-i}, \tau_{-i})\). This implies that for any \( w \), the payoff from producing under \((\theta_i, \tau_i)\) is greater than the payoff from producing under \((\theta_{-i}, \tau_{-i})\). Thus, all agents vote for \((\theta_i, \tau_i)\) which thus wins.

Suppose \( V(\theta_i, \tau_i; \tilde{w}) = V(\theta_{-i}, \tau_{-i}; \tilde{w}) \). If \( \theta_i < \tilde{\theta} < \theta_{-i} \) then the median voter is indifferent between producing under \((\theta_i, \tau_i)\) and appropriating under \((\theta_{-i}, \tau_{-i})\). This implies that, for any \( w \), the payoff from production under \((\theta_i, \tau_i)\) is greater than under \((\theta_{-i}, \tau_{-i})\) while the payoff from appropriation under \((\theta_i, \tau_i)\) is smaller than under \((\theta_{-i}, \tau_{-i})\). This implies that all agents with \( w > \tilde{w} \) prefer \((\theta_i, \tau_i)\) while all agents with \( w < \tilde{w} \) prefer \((\theta_{-i}, \tau_{-i})\). Thus, a measure \( \frac{1}{2} \) of agents vote for either schedule so that \((\theta_i, \tau_i)\) wins with probability \( \frac{1}{2} \).

If \( \theta_i = \tilde{\theta} \), then, since \( V(\theta_i, \tau; w) = (1 - \tau)V(\theta, \theta; w) \) for all \( \theta, \tau \), and \( w, \tau_i = \tau_{-i} \). Thus, \((\theta_i, \tau_i) = (\tilde{\theta}, \tau_{-i})\) and both proposals have equal and thus \( \frac{1}{2} \) probability of winning.

Suppose that \( \tilde{\theta} > \theta_i > \theta_{-i} \). Then, the median voter is indifferent between being a producer under either regime, so that it can be concluded that, for any \( w \), the payoff from producing is the same under both regimes. So all agents with \( w \geq w^*(\theta_i) \) are indifferent. The agent with \( w = w^*(\theta_{-i}) \) is indifferent between production and appropriation under \((\theta_{-i}, \tau_{-i})\) while he prefers to appropriate under \((\theta_i, \tau_i)\). Since he is indifferent between producing under each regime, this implies that the payoff from appropriation under \((\theta_i, \tau_i)\) is greater than the under \((\theta_{-i}, \tau_{-i})\). The agent with \( w = w^*(\theta_i) \) is indifferent between appropriation and production under \((\theta_i, \tau_i)\) where the latter is the same as under \((\theta_{-i}, \tau_{-i})\). This implies that all agents with \( w < w^*(\theta_i) \) prefer \((\theta_i, \tau_i)\) over \((\theta_{-i}, \tau_{-i})\). So, a measure \( F(w^*(\theta_i)) + \frac{1}{2}(1 - F(w^*(\theta_i))) = \frac{1}{2} + \frac{1}{2}F(w^*(\theta_i)) > \frac{1}{2} \) of agents vote for \((\theta_i, \tau_i)\) which thus wins.

Suppose that \( \tilde{\theta} > \theta_i > \theta_{-i} \). The median voter is indifferent between appropriation under either regime. Thus all agents with \( w \leq w^*(\theta_i) \) are indifferent, as they would be appropriators under either regime. For all agents with \( w \in (w^*(\theta_i), w^*(\theta_{-i})) \), agents prefer producing over appropriating under \((\theta_i, \tau_i)\) while they would be indifferent between appropriating under either regime which they prefer to producing under \((\theta_{-i}, \tau_{-i})\). This implies that, for any \( w \), the payoff from producing under \((\theta_i, \tau_i)\) is greater than the payoff from producing under \((\theta_{-i}, \tau_{-i})\). Hence, all agents with \( w > w^*(\theta_i) \) prefer \((\theta_i, \tau_i)\) so that a measure \( \frac{1}{2}F(w^*(\theta_i)) + (1 - F(w^*(\theta_i))) = 1 - \frac{1}{2}F(w^*(\theta_i)) > \frac{1}{2} \) of agents vote for \((\theta_i, \tau_i)\) which thus wins.

Now, notice that there is a nontrivial set of agents that is indifferent between the regimes proposed only when either \( \theta_i = \theta_{-i} \) (all agents are indifferent), \( \tilde{\theta} > \theta_i > \theta_{-i} \) (all agents with \( w \geq w^*(\theta_i) \) are indifferent), or \( \tilde{\theta} > \theta_i > \theta_{-i} \) (all agents with \( w \leq w^*(\theta_i) \) are indifferent). In fact, in all these cases, the measures of these sets
Proposition 2

I describe equilibrium requirements and then show that there is one and characterize it. I use Lemma 5 in terms of the function mapping proposals and candidate skills in probabilities of winning as reported in appendix B.2.

Lemma 6. Suppose the set of proposals \( \{(\theta_i, \tau_i), (\theta_{-i}, \tau_{-i})\}, \ i, -i \in \{L, H\}, -i \neq i \), constitute an equilibrium of the political game. Then, the following has to hold.

1. If the regime \((\theta_i, \tau_i)\) has positive probability of winning the election over \((\theta_{-i}, \tau_{-i})\), then it has to satisfy \(\tilde{w}(\theta_i, \tau_i) \geq V(\theta_{-i}, \tau_{-i}; w_i)\), \(\tilde{w}(\theta_i, \tau_i) \geq \tilde{w}(\theta_{-i}, \tau_{-i})\), and \(V(\theta_i, \tau_i; w_{-i}) \geq \tilde{w}(\theta_i, \tau_i)\).

2. Suppose that \((\theta_i, \tau_i)\) wins the election over \((\theta_{-i}, \tau_{-i})\), with positive probability. Then, \((\theta_i, \tau_i)\) satisfies \(\theta_i \leq \tilde{\theta}(\tau_i) < \tilde{\theta}\) and \(V(\theta_i, \tau_i; \tilde{w}) = V(\theta_{-i}, \tau_{-i}; \tilde{w})\). Moreover, any equilibrium is either pooling or separating with only one proposal having positive probability of winning.

3. If proposal \(i\) has positive probability of winning, then it has to solve problem (P) given \(\varphi = \varphi_i = (1 - \tau_{-i})(1 - F(w^*(\theta_{-i}))\theta_{-i})\), i.e., \(\tilde{w}(\theta_i, \tau_i) = \tilde{w}^*(\varphi_i)\).

4. Any equilibrium is either pooling or separating in which one agent wins for sure and the institutions satisfy \(\theta < \tilde{\theta}\).

Proof. Consider each point in turn.

1. Suppose for a contraposition that \(\tilde{w}(\theta_i, \tau_i) < V(\theta_{-i}, \tau_{-i}; w_i)\). Agent \(i\) could offer a schedule that loses against \((\theta_{-i}, \tau_{-i})\), say \((\theta'_i, \tau'_i) = (1, 1)\). Then, his payoff is higher implying that he did not play a best response before which contradicts the assumption that \(\{(\theta_i, \tau_i), (\theta_{-i}, \tau_{-i})\}\) constitutes an equilibrium of the political game. Similarly, suppose for a contraposition that \(\tilde{w}(\theta_i, \tau_i) < \tilde{w}(\theta_{-i}, \tau_{-i})\). Then, agent \(i\) could have offered \((\theta_i, \tau_i) = (\theta_{-i}, \tau_{-i} - \epsilon)\) for some small \(\epsilon > 0\), win the election for sure and receive \(\tilde{w}(\theta_{-i}, \tau_{-i} - \epsilon) > \tilde{w}(\theta_i, \tau_i) > V(\theta_{-i}, \tau_{-i}; w_i)\). Thus, he did not play a best response and the set of proposals is not an equilibrium. Also, suppose for a contraposition that \(\tilde{w}(\theta_i, \tau_i) > V(\theta_i, \tau_i; w_{-i})\). One
feasible response of agent \( j \) is \((\theta_{-i}, \tau_{-i}) = (\theta_i, \tau_i - \epsilon)\) for some small \( \epsilon > 0 \) such that \( \tilde{w}(\theta_{-i}, \tau_{-i}) > V(\theta_i, \tau_i; w_{-i}). \) All voters prefer this schedule, so \( j \) wins the election and is strictly better off than before (even if he had \( \frac{1}{2} \) probability of winning) since \( \tilde{w}(\theta_i, \tau_i) \geq \tilde{w}(\theta_{-i}, \tau_{-i}). \) Thus, he did not play a best response contradicting the assumption that \[ \{(\theta_i, \tau_i), (\theta_{-i}, \tau_{-i})\} \] constitutes an equilibrium of the political game.

2. Fix \( \tau_i. \) First, suppose \( \theta_i \geq \tilde{\theta}. \) Since \( \tilde{\theta}(\tau_i) < \tilde{\theta} \) and \( \tilde{\theta}(\tau_i) \leq \tilde{\theta} \) and producers always prefer a smaller \( \theta_i, \) the winner does not maximize payoffs since decreasing \( \theta_i \) wins him the election at a higher in-office payoff. (In the limiting case where \( \theta_i = \tilde{\theta} = \tilde{\theta}(\tau_i) \), the median agent is just indifferent between being a producer or an appropriator. Thus, decreasing \( \theta_i \) slightly increases his payoff so that he votes for the lower \( \theta_i \) which then wins the election.) This violates equilibrium conditions. Second, suppose that \( \theta_i > \tilde{\theta}(\tau_i). \) Since \( w^*(\theta_i) < \tilde{w}, \) the measure of producers is greater than \( \frac{1}{2}. \) Therefore, leaving \( \tau_i \) unchanged, a lower \( \theta_i \) would win him the election with higher in-office payoffs. This violates equilibrium conditions.

Suppose that \( V(\theta_i, \tau_i; \tilde{w}) - V(\theta_{-i}, \tau_{-i}; \tilde{w}) = \epsilon \) for some \( \epsilon > 0. \) Then, leaving \( \theta_i \) unchanged, increasing \( \tau_i \) slightly increases \( \tilde{w}(\theta_i, \tau_i) \) while still winning the election. This violates equilibrium conditions.

From (19)-(21) it follows directly that any equilibrium with positive probability of winning for both proposals has to be pooling.

3. Suppose for a contradiction that this does not hold. Let the solution to (P) given \( \bar{\varphi} = \varphi_i \) be \( (\theta^*_i, \tau^*_i). \) Then, it has to be true that \( \tilde{w}^*(\varphi_i) = \tilde{w}(\theta^*_i, \tau^*_i) > \tilde{w}(\theta_i, \tau_i) \geq V(\theta_{-i}, \tau_{-i}; \tilde{w}) \) and \( V(\theta_i, \tau_i; \tilde{w}) = V(\theta_{-i}, \tau_{-i}; \tilde{w}) \). Thus, \( i \) could propose \( (\theta^*_i, \tau^*_i - \epsilon), \epsilon > 0 \) and small, so that both \( i \)'s in-office payoff and the median voter’s payoff strictly increase. Agent \( i \) would win for sure and get \( \tilde{w}(\theta^*_i, \tau^*_i - \epsilon) > \tilde{w}(\theta_i, \tau_i) \geq V(\theta_{-i}, \tau_{-i}; \tilde{w}) \) which contradicts the assumption of an equilibrium set of proposals.

4. Result 2 of this very lemma implies both that the median voter’s payoffs under either regime are equal in equilibrium and that any schedule \( (\theta, \tau) \) that wins with positive probability satisfies \( \theta < \tilde{\theta}. \)

This completes the proof.

Q.E.D.

Thus, necessary conditions for the policy \( (\theta_i, \tau_i) \) to win are \( V(\theta_i, \tau_i; \tilde{w}) = V(\theta_{-i}, \tau_{-i}; \tilde{w}) \) and \( \theta_{-i} < \theta_i \leq \tilde{\theta}(\tau_i) < \tilde{\theta} \) in a separating equilibrium and \( (1 - \tau)V(\theta, 0; w_{-i}) = \tilde{w}(\theta, \tau) \) and \( (1 - \tau)V(\theta, 0; w_i) = \tilde{w}(\theta, \tau) \) in a pooling equilibrium.

**Lemma 7** (Pooling equilibrium). *If a pooling equilibrium \((\theta_p, \tau_p)\) exists, then it is unique and the quality of the institutions implemented is independent of both \( w_L \) and \( w_H. \) If \( w_H > w^*(\theta_p), \) then a pooling equilibrium does not exist.*

**Proof.** Suppose \( (\theta_L, \tau_L) = (\theta_H, \tau_H) = (\theta_p, \tau_p) \) constitutes a pooling equilibrium. Then both agents have probability \( \frac{1}{2} > 0 \) of winning. That is, by the first part of lemma 6, \( V(\theta_p, \tau_p; w_L) \geq \tilde{w}(\theta_p, \tau_p) \geq V(\theta_p, \tau_p; w_H) \geq \tilde{w}(\theta_p, \tau_p) \geq V(\theta_p, \tau_p; w_L), \) so that \( V(\theta_p, \tau_p; w_L) = \tilde{w}(\theta_p, \tau_p) = V(\theta_p, \tau_p; w_H). \) Since \( V(\theta, \tau; w) \) is monotonic in \( w, \) this implies that \( w^*(\theta_p) \geq w_H \) has to hold. Suppose a pooling equilibrium \( (\theta_p, \tau_p) \) exists and \( w^*(\theta_p) \geq w_H. \) It has to be the case that

\[
\tilde{w}(\theta_p, \tau_p) = \tau_p \int_{w^*(\theta_p)}^{1} w f(w) dw - g(\theta_p) = (1 - \tau_p) \theta_p \int_{w^*(\theta_p)}^{1} w f(w) dw.
\]

Additionally, by lemma 6, the proposal \( (\theta_p, \tau_p) \) solves problem (P) for some \( \bar{\varphi}_p = \varphi_{p_p} = (1 - F(w^*(\theta_p))) \theta_p (1 - \tau_p). \) (The in-office payoff given a regime is independent of the office holder’s skill.) That is, it solves (P) given
the opponent’s proposal is the pooling proposal. The equality (25) gives

$$
\tau_p(\theta_p) = \frac{\theta_p \int_{w^*(\theta_p)}^1 w f(w) dw + g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta_p)}^1 w f(w) dw} \quad \text{and} \quad 1 - \tau_p(\theta_p) = \frac{\int_{w^*(\theta_p)}^1 w f(w) dw - g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta_p)}^1 w f(w) dw}.
$$

Then, by lemma 2, \((\theta_p, \tau_p, \varphi_p)\) solves the following system of three equations in three unknowns:

$$
(1 - F(w^*(\theta_p))\theta_p)(1 - \tau_p) = \varphi_p,
$$

$$
\tau_p(\theta_p) = \frac{\theta_p \int_{w^*(\theta_p)}^1 w f(w) dw + g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta_p)}^1 w f(w) dw}
$$

$$
-\tau_p w^*(\theta_p)f(w^*(\theta_p))w^*(\theta_p) - g'(\theta_p) = \theta_p^{-1} w^*(\theta_p)[F(w^*(\theta_p)) + \theta_p f(w^*(\theta_p))w^*(\theta_p)](1 - \tau_p).
$$

Combining the second and the third equation, \(\theta_p\) solves

$$
-\frac{\theta_p \int_{w^*(\theta)}^1 w f(w) dw + g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta)}^1 w f(w) dw} - \theta_p^{-1} w^*(\theta_p)[F(w^*(\theta_p)) + \theta_p f(w^*(\theta_p))w^*(\theta_p)] = \frac{\int_{w^*(\theta)}^1 w f(w) dw - g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta)}^1 w f(w) dw}.
$$

Repeating yields

$$
-\frac{\int_{w^*(\theta)}^1 w f(w) dw + g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta)}^1 w f(w) dw} - \theta_p^{-1} w^*(\theta_p)[F(w^*(\theta_p)) + \theta_p f(w^*(\theta_p))w^*(\theta_p)] = \frac{\int_{w^*(\theta)}^1 w f(w) dw - g(\theta_p)}{(1 + \theta_p) \int_{w^*(\theta)}^1 w f(w) dw}.
$$

To simplify notation, define

$$
\Psi_1(\theta) = \int_{w^*(\theta)}^1 w f(w) dw - g(\theta)
$$

$$
\Psi_2(\theta) = \frac{\int_{w^*(\theta)}^1 w f(w) dw}{\theta^{-1} w^*(\theta) F(w^*(\theta))}.
$$

\(\Psi_1\) is quasi-concave and has its unique maximum at \(\theta = \hat{\theta}(1)\). \(\Psi_1(0) = \mu - g(0) < 0\), \(\Psi_1(\theta)\) is strictly increasing for all \(\theta < \hat{\theta}(1)\) and strictly decreasing for all \(\theta > \hat{\theta}(1)\). Assume that \(\Psi_1(\hat{\theta}(1)) > 0\) as otherwise \(\hat{\psi}(\theta, \tau) \leq 0\) for all \((\theta, \tau) \in [0, 1]^2\). \(\Psi_1(\theta) < 0\) cannot be an equilibrium since it implies that \(\hat{\psi}(\theta, \tau) < 0\) which contradicts individual rationality as \(V(\theta, \tau; w) \geq 0\) for all \((\theta, \tau)\) and \(w\). Since \(\Psi_2(\theta) < 0\) for all \(\theta > \hat{\theta}(1)\), the relevant area is \(\theta < \hat{\theta}(1)\). On this subset of the domain, \(\Psi_1\) is strictly increasing. As to \(\Psi_2\), rewriting it to

$$
\Psi_2(\theta) = \frac{[-w^*(\theta)f(w^*(\theta))w^*'(\theta) - g'(\theta)](1 + \theta) \int_{w^*(\theta)}^1 w f(w) dw}{\theta^{-1} w^*(\theta) F(w^*(\theta))},
$$

the nominator is strictly decreasing in \(\theta\). The denominator weakly increases in \(\theta\) if and only if \(\frac{w^*(\theta)f(w^*(\theta))}{F(w^*(\theta))} \geq \frac{1}{2}\). On the relevant subset of the domain, \(\theta \leq \hat{\theta}(1) \leq \theta \leq \theta_{mod}\), where \(\theta_{mod} = w^*(\theta_{mod}) = mod(F)\), so that \(f'(w^*(\theta)) \geq 0\) for all \(\theta \in [0, \hat{\theta}(1)]\). Since, \(w^*(0)f(w^*(0)) = 0f(0) = F(w^*(0)) = F(0) = 0\) and \(f(w) + w f'(w) \geq f(w)\) for all \(w \leq \theta_{mod}\) it holds that \(w^*(\theta)f(w^*(\theta)) \geq F(w^*(\theta)) > \frac{1}{2} F(w^*(\theta))\). That is, the denominator of \(\Psi_2\) is weakly increasing in \(\theta\) and, thus, \(\Psi_2\) is strictly decreasing in \(\theta\) on \((0, \hat{\theta}(1))\). Now, \(\Psi_1(0) < 0 < \Psi_2(0)\) and \(\Psi_1(\hat{\theta}(1)) > 0 = \Psi_2(\hat{\theta}(1))\). Thus, by continuity and strict monotonicity of both \(\Psi_1\) and \(\Psi_2\) on \((0, \hat{\theta}(1))\), there exists a unique \(\theta_p \in (0, \hat{\theta}(1))\) such that \(\Psi_1(\theta_p) = \Psi_2(\theta_p)\). Then, given \(\theta_p\), (26) gives a unique \(\tau_p(\theta_p)\), and the constraint yields \(\varphi_p\).
Obviously, neither \(w_L\) nor \(w_H\) matter since they don’t appear in the equations that determine the unique solution \((\theta_p, \tau_p)\). Finally, since any pooling equilibrium is given by \((\theta_p, \tau_p)\), if \(w_H > w_p \equiv w^*(\theta_p)\), then the above argument shows that a pooling equilibrium does not exist.

Q.E.D.

**Lemma 8** (Separating equilibrium). *In any separating equilibrium, if \(w_H\) wins the election with probability one, then \(w_H \leq w^*(\theta_H)\).*

**Proof.** Suppose for a contradiction that there is a separating equilibrium where \(H\) wins and \(w_H > w^*(\theta_H)\). By lemma 6, the equilibrium set of proposals \(\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}\) has to satisfy \(V(\theta_H, \tau_H; w_L) \geq w(\theta_H, \tau_H, \theta_L) \geq V(\theta_L, \tau_L; w_H)\), \(V(\theta_H, \tau_H; \bar{\theta}) = V(\theta_L, \tau_L; \bar{\theta})\), and \(\theta_L < \theta_H < \theta\). Since \(w_H > w^*(\theta_H)\), \((1 - F(w^*(\theta_H))\theta_H)\) \(w_H = V(\theta_H, \tau_H; w_H) > V(\theta_H, \tau_H; w_L) \geq w(\theta_H, \tau_H) \geq V(\theta_L, \tau_L; w_H) \geq (1 - F(w^*(\theta_L))\theta_L)\) \(w_H\) implying that \((1 - F(w^*(\theta_H))\theta_H)(1 - \tau_H) > (1 - F(w^*(\theta_L))\theta_L)(1 - \tau_L)\) and thus \(V(\theta_H, \tau_H, \bar{\theta}) > V(\theta_L, \tau_L; \bar{\theta})\), a contradiction. This completes the proof.

Q.E.D.

**Lemma 9.** In equilibrium, if regime \((\theta_i, \tau_i), i \in \{L, H\}\) wins over regime \((\theta_{-i}, \tau_{-i}), -i \in \{L, H\}\), \(\tau_i = V(\theta_i, \tau_i; w_{-i})\). Moreover, if in a separating equilibrium \((\theta^*, \tau^*)\) wins the election and \(w_L < w_H \leq w^*(\theta^*)\), then the winning policy satisfies \((\theta^*, \tau^*) = (\theta_p, \tau_p)\), irrespectively of the winner’s identity.

**Proof.** Consider any equilibrium and let \((\theta^*_i, \tau^*_i)\) satisfy \(w(\theta_i, \tau_i) = w^*(\varphi_i)\) for any \(i \in \{L, H\}\). There are two claims. First, \(\bar{w}(\theta^*_i, \tau^*_i) \geq V(\theta_i, \tau_i; w_{-i})\). Suppose for a contradiction that \(V(\theta_i, \tau_i; w_{-i}) > w(\theta^*_i, \tau^*_i)\), \(\bar{w}(\theta_i, \tau_i; \bar{\theta}) \geq \bar{w}(\theta^*_i, \tau^*_i; \bar{\theta})\). Since \(V(\theta_i, \tau_i; w_{-i}) = V(\theta_i, \tau_i; \bar{\theta})\), \(\tau^*_i\) wins with probability \(\epsilon > 0\). If he offered any \((\theta^*_i, \tau^*_i)\) such that \(V(\theta_i, \tau_i; w_{-i}) > V(\theta^*_i, \tau^*_i; \bar{\theta})\), he would lose with probability one receiving a payoff \(V(\theta_i, \tau_i; w_{-i}) > V(\theta^*_i, \tau^*_i; w_{-i})\). If \(\bar{w}(\theta^*_i, \tau^*_i) \geq \bar{w}(\theta^*_i, \tau^*_i; \bar{\theta})\), \(\bar{w}(\theta^*_i, \tau^*_i; \bar{\theta}) \geq V(\theta_i, \tau_i; w_{-i})\). Thus, this contradicts the assumption of an equilibrium to start with. Second, \(\bar{w}(\theta^*_i, \tau^*_i; \bar{\theta}) \geq V(\theta^*_i, \tau^*_i; w_{-i})\). Suppose for a contradiction that \(\bar{w}(\theta^*_i, \tau^*_i; \bar{\theta}) \leq V(\theta_i, \tau_i; \bar{\theta})\). Agent \(i\) could propose \((\theta^*_i, \tau^*_i) = (\theta^*_i, \tau^*_i - \epsilon)\) for some small \(\epsilon > 0\). He would win for sure since \(V(\theta^*_i, \tau^*_i - \epsilon; \bar{\theta}) > V(\theta^*_i, \tau^*_i; \bar{\theta}) \geq V(\theta^*_i, \tau^*_i; \bar{\theta})\) by the constraint in (P) and get \(\bar{w}(\theta^*_i, \tau^*_i - \epsilon) \geq \bar{w}(\theta^*_i, \tau^*_i) \geq V(\theta_i, \tau_i; w_{-i})\). Thus, this contradicts the assumption of an equilibrium to start with. Together these two facts imply that \(\bar{w}(\theta^*_i, \tau^*_i; \bar{\theta}) \leq V(\theta^*_i, \tau^*_i; \bar{\theta}) \geq \bar{w}(\theta^*_i, \tau^*_i)\) establishing the result.

Suppose there exists a separating equilibrium in which \((\theta^*, \tau^*)\) wins the election and \(w_L < w_H \leq w^*(\theta^*)\). Let \(w_{-i} \in \{w_L, w_H\}\) be the loser. Since \(w(\theta^*, \tau^*) = V(\theta^*, \tau^*; w_{-i})\), it holds that

\[
\tau^* \int_{w^*(\theta^*)}^{1} w f(w) dw - g(\theta^*) = (1 - \tau^*) \theta^* \int_{w^*(\theta^*)}^{1} w f(w) dw.
\]

Furthermore, \((\theta^*, \tau^*)\) has to solve (P) given \(\bar{\varphi} = \varphi_i = (1 - F(w^*(\theta_{-i}))) \theta_{-i}(1 - \tau_{-i})\). This implies that the (sub)system of two equations in two unknowns that solve for \((\theta^*, \tau^*)\) coincides with (26) and (30). Thus, since \((\theta_p, \tau_p)\) is the unique solution to that system, \((\theta^*, \tau^*) = (\theta_p, \tau_p)\), as was to be shown.

Q.E.D.

An additional argument with respect to the cutoff \(w_p\) is required.

**Lemma 10.** If \(w_H > w^*(\theta^*)\), then \(\theta^* > \theta_p\). If \(w_H \leq w_p\), then \((\theta^*, \tau^*) = (\theta_p, \tau_p)\). If \(w_H > w_p\), then \(w_L\) wins.

**Proof.** Notice first that \(\Psi_1(\theta) = \psi_1(\theta; w_H)\) for all \(\theta\) and \(w_H\). In equilibrium, since \(w_H > w^*(\theta^*)\), \(\Psi_1(\theta^*) = \psi_1(\theta^*; w_H) = \psi_2(\theta^*; w_H) > \psi_2(\theta_p)\), while \(\theta_p\) satisfies \(\Psi_1(\theta_p) = \Psi_2(\theta_p)\). Since \(\Psi_1(\theta)\) is strictly increasing on \((0, \bar{\theta}(1))\) and \(\Psi_2(\theta)\) is strictly decreasing on \((0, \bar{\theta}(1))\), \(\theta^* > \theta_p\).
Assume that $w_H \leq w_p$. Suppose for a contradiction that $\theta^* \neq \theta_p$. If $\theta^* > \theta_p$, then $w^*(\theta^*) > w_p \geq w_H$ and the equilibrium is separating. Thus, by lemma 9, $\theta^* = \theta_p$, a contradiction. If $\theta^* < \theta_p$, then the equilibrium is separating and either $w_H \leq w^*(\theta^*)$ or $w_H > w^*(\theta^*)$. If $w_H \leq w^*(\theta^*)$, then by lemma 9, $\theta^* = \theta_p$, a contradiction. If $w_H > w^*(\theta^*)$, then by the first part, $\theta^* > \theta_p$, a contradiction. Thus, $w_H \leq w_p = w^*(\theta^*)$ and by lemma 9, $(\theta^*, \tau^*) = (\theta_p, \tau_p)$.

Suppose for a contradiction that $w_H > w_p$ and $w_H$ wins. Since $w_H > w_p$, the equilibrium is separating and, by lemma 8, $w_H \leq w^*(\theta^*)$. By lemma 9 together with the fact that $w^2 \leq w^*_H \leq w^*(\theta^*)$, this implies that $\theta^* = \theta_p$ and $w(\theta^*) = w_p$. Thus, $w_H \leq w_H \leq w_p$ which is a contradiction. Q.E.D.

Now, these lemmas can be used to prove proposition 2.

**Proof.** Lemma 6 directly implies that in any equilibrium $V(\theta, \tau; \tilde{w}) = V(\theta_{-i}, \tau_{-i}; \tilde{w})$ and $\theta^* < \bar{\theta}$, i.e., the median voter is indifferent between regimes and chooses to produce. Lemma 7 proves all the statements for pooling equilibria and defines $w_p = w^*(\theta_p)$. That is, all equilibria with $\theta^* > \theta_p$ are separating. Lemma 8 states that there is no separating equilibrium in which $w_p$ wins with a regime $(\theta_{\bar{H}}, \tau_{\bar{H}})$ in which he would be a producer if not in office. Lemma 9 show that any separating equilibrium that satisfies $w_H \leq w^*(\theta^*)$ looks like a pooling equilibrium. By lemma 10, if $w_H \leq w_p$, then the pooling equilibrium outcome prevails and if $w_H > w_p$, then the equilibrium is separating and $w_L$ wins with probability 1. Moreover, lemma 9 say that, in a separating equilibrium, i.e., when $w_H > w_p$, the winning regime satisfies $\tilde{w}(\theta_i, \tau_i) = V(\theta_i, \tau_i; w_H)$. Then, $w_L$ wins the election by lemma 8 and agent $w_H$ is (or would choose to be) a producer in equilibrium. Thus, collecting equations, in any equilibrium, $(\theta_L, \tau_L)$ has to solve (P) and $\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}$ has to satisfy

$$V(\theta_L, \tau_L; \tilde{w}) = V(\theta_H, \tau_H; \tilde{w})$$

$$\tilde{w}(\theta_L, \tau_L) = V(\theta_L, \tau_L; w_H).$$

The latter implies that

$$\tau_L \int_{w^*(\theta_L)}^1 w f(w) dw - g(\theta_L) = (1 - F(w^*(\theta_L))) \theta_L (1 - \tau_L) w_H.$$  \hspace{1cm} (32)

This equation can be rewritten to yield the tax $\tau_L$ as a function of $\theta_L$, $\tau_L(\theta_L)$.

$$\tau_L(\theta_L) = \frac{(1 - F(w^*(\theta_L))) \theta_L w_H + g(\theta_L)}{(1 - F(w^*(\theta_L))) \theta_L w_H + \int_{w^*(\theta_L)}^1 w f(w) dw}$$

$$1 - \tau_L(\theta_L) = \frac{\int_{w^*(\theta_L)}^1 w f(w) dw - g(\theta_L)}{\int_{w^*(\theta_L)}^1 w f(w) dw + (1 - F(w^*(\theta_L))) \theta_L w_H}. \hspace{1cm} (34)$$

Moreover, in equilibrium, $w_H$ is making an offer that equalizes the median voter’s payoff from both proposals and, since $\theta_H < \theta_L < \bar{\theta}$, the median voter’s occupation under either regime would be producer. Thus, let the equilibrium expected payoff of the median voter be $V(\theta_i, \tau_i; \tilde{w}) = V(\theta_{-i}, \tau_{-i}; \tilde{w}) = \varphi_H \tilde{w}$ so that $\varphi_H = (1 - F(w^*(\theta_L))) \theta_L (1 - \tau_L) = (1 - F(w^*(\theta_H))) \theta_H (1 - \tau_H)$. Let $T_H(\theta_L, \varphi) \equiv \{ (\theta, \tau) \in [0, 1]^2 : (1 - F(w^*(\theta))) \theta (1 - \tau) = \varphi \}$. Notice that $T_H(\theta_L, \varphi_H) \neq \emptyset$ whenever $(\theta_L, \varphi_H) > 0$. Then it is required that, in equilibrium, $(\theta_H, \tau_H) \in T_H(\theta_L, \varphi_H)$. On the other hand, by lemma 6, agent $L$’s proposal
has to solve (P). Thus, using lemma 2, dropping subscripts for the moment, \((\theta_L, \tau_L, \varphi_H)\) solve
\[
\tau_L = (1 - F(w^*(\theta))\theta)(1 - \tau) = \varphi
\]
\[
(1 - F(w^*(\theta))\theta)w_H + g(\theta)
\]
\[-\tau w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta) = \theta^{-1}w^*(\theta)[F(w^*(\theta)) + \theta f(w^*(\theta))w^*(\theta)](1 - \tau).
\]
Combining the second and the third equation, this can be rewritten to
\[
\frac{-\tau w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta)}{\int_{w^*(\theta)}^{1} w f(w)dw + (1 - F(w^*(\theta))\theta)w_H}
\]
\[
= \frac{\theta^{-1}w^*(\theta)[F(w^*(\theta)) + \theta f(w^*(\theta))w^*(\theta)]}{\int_{w^*(\theta)}^{1} w f(w)dw + (1 - F(w^*(\theta))\theta)w_H}.
\]
Rewriting yields
\[
\frac{(-w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta))}{\theta^{-1}w^*(\theta)F(w^*(\theta))} = \int_{w^*(\theta)}^{1} w f(w)dw - g(\theta).
\]
(35)
To simplify notation, define
\[
\psi_1(\theta; w_H) = \int_{w^*(\theta)}^{1} w f(w)dw - g(\theta)
\]
\[
\psi_2(\theta; w_H) = \frac{(-w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta))}{\theta^{-1}w^*(\theta)F(w^*(\theta))}.
\]
\(\psi_1\) is quasi-concave and has its unique maximum at \(\theta = \hat{\theta}(1)\). It is strictly increasing for all \(\theta < \hat{\theta}(1)\) and strictly decreasing for all \(\theta > \hat{\theta}(1)\). \(\psi_1(0; w_H) = \mu - g(0) < 0\) and if \(\psi_1(\theta'; w_H) > 0\), then \(\psi_1(\theta; w_H) \geq 0\) for all \(\theta > \theta'\). As to \(\psi_2\), given \(w_H\), the denominator is increasing in \(\theta\), while each term in the product constituting the nominator is decreasing in \(\theta\) in the relevant area. The relevant area is \(\theta \leq \hat{\theta}(1)\) since for all \(\theta > \hat{\theta}(1)\), \(\psi_1(\theta; w_H) \geq 0\) while \(\psi_2(\theta; w_H) < 0\). Then, \(\hat{\theta}(1) \leq \hat{\theta} \leq \hat{\theta}_{mod}\), where \(w^*(\theta_{mod}) = mod(F)\), so that \(f'(\theta) \geq 0\) for all \(\theta \leq \hat{\theta}(1)\). Thus, \(\psi_2\) is strictly decreasing in \(\theta\) on the relevant subset of the domain. Now, by continuity, there is \(\theta' > 0\), \(\theta' < \hat{\theta}(1)\), such that \(\psi_1(\theta'; w_H) < 0\) and \(\psi_2(\theta'; w_H) > 0\). Furthermore, \(\psi_1(\hat{\theta}(1); w_H) > 0\) and \(\psi_2(\hat{\theta}(1); w_H) = 0\). Thus, by the intermediate value theorem and the strict monotonicity of both functions on \((0, \hat{\theta}(1))\), there exists a unique \(\theta^*\) such \(\psi_1(\theta^*; w_H) = \psi_2(\theta^*; w_H)\). Then, given \(\theta_L = \theta^*\), (33) give a unique \(\tau_L(\theta^*)\), and from the constraint \(\varphi^*\). Any \((\theta_H, \tau_H) \in T_H(\theta^*, \varphi^*)\) establishes both existence of equilibrium of the political game and uniqueness of the winning regime.

It remains to verify that any such set of schedules is an equilibrium. By construction, given the \((\theta_H, \tau_H)\), agent \(w_L\) cannot increase expected payoffs by deviating. He could increase in-office payoff only by offering something that would make the median voter strictly worse off than with his opponent’s proposal and would thus lose falling back to his strictly smaller outside option. Any other proposal that would win gives a worse in-office payoff. Similarly, given \((\theta_L, \tau_L)\), agent \(w_H\) cannot increase expected payoffs by deviating. Any deviation that still loses the election does not change payoffs. The relevant deviations are the ones he gets into office with. The best he can propose to make the median voter at least as well off as with \(L\)’s proposal is \((\theta_L, \tau_L)\). He weakly (strictly when \(w_H\) is the leader) prefers no to deviate to pooling. Any other potentially winning
and the corresponding equilibrium satisfies $w_1(w) < w_2(w)$ in equation (34). For notational simplicity, let $w$ expressions are differentiable in both their arguments. Also, $w^*(\theta)$ is differentiable in $\theta$ and the expression for $1 - \tau$ in equation (34) is differentiable in both $\theta$ and $w_H$.

If $w_H < w_p$, then $(\theta^*, \tau^*) = (\theta_p, \tau_p)$ and there is an $\epsilon > 0$ such that for all $w_H' \in (w_H - \epsilon, w_H + \epsilon)$, $w_H' < w_p$ and the corresponding equilibrium satisfies $(\theta^*, \tau^*) = (\theta_p, \tau_p)$. That is, all the functions are differentiable with respect to $w_H$ for all $w_H < w_p$ and don’t change in $w_H$.

Assume that $w_H > w_p$. Recall that the equilibrium tax $\tau$ and the expression $1 - \tau$ are given by equations (33) and (34). For notational simplicity, let $(\theta, \tau)$ refer to the equilibrium regime $(\theta^*, \tau^*)$. The relevant equilibrium expressions are $\varphi(\theta, \tau)$, $\nu(\theta, \tau) = \varphi(\theta, \tau)w^*(\theta)$, and $\tilde{w}(\theta, \tau) = \varphi(\theta, \tau)w_H$. Using (34), these can be rewritten as

\[
\varphi(\theta, \tau) = (1 - F(w^*(\theta)\theta)(1 - \tau) = (1 - F(w^*(\theta)\theta)
\]

\[
= \frac{\int_{w^*(\theta)}^{1} wf(w)dw - g(\theta)}{\theta^{-1}w^*(\theta) + w_H}
\]

\[
\nu(\theta, \tau) = \varphi(\theta, \tau)w^*(\theta) = \frac{\int_{w^*(\theta)}^{1} wf(w)dw - g(\theta)}{\theta^{-1}w^*(\theta) + w_H}w^*(\theta)
\]

\[
\tilde{w}(\theta, \tau) = \varphi(\theta, \tau)w_H = \frac{\int_{w^*(\theta)}^{1}wf(w)dw - g(\theta)}{\theta^{-1}w^*(\theta) + w_H}w_H.
\]

All of them are differentiable with respect to both $w_H$ and $\theta$. Notice first that

\[
\frac{\partial \varphi(\theta, \tau)}{\partial w_H} = -\frac{\int_{w^*(\theta)}^{1}wf(w)dw - g(\theta)}{(\theta^{-1}w^*(\theta) + w_H)^2} = -\left(\theta^{-1}w^*(\theta) + w_H\right)^{-1}\varphi(\theta, \tau)
\]

\[
\frac{\partial \varphi(\theta, \tau)}{\partial \theta} = \left(\theta^{-1}w^*(\theta) + w_H\right)^{-2}\left[(-w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta))\left(\theta^{-1}w^*(\theta) + w_H\right)\right]
\]

\[
= \left(\frac{\theta^{-1}w^*(\theta) + w_H}{1 - F(w^*(\theta)\theta)}\right)^{-2}\left[(-w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta))(1 - F(w^*(\theta)\theta))\left(\theta^{-1}w^*(\theta) + w_H\right)\right]
\]

\[
+ \left(\frac{\theta^{-1}w^*(\theta) + w_H}{1 - F(w^*(\theta)\theta)}\right)^{-2}\left[(-w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta))\left(\int_{w^*(\theta)}^{1}wf(w)dw\right)
\]

\[
+ (1 - F(w^*(\theta)\theta)w_H)\right)\left(\theta^{-1}w^*(\theta)F(w^*(\theta))\right) = 0
\]

since, in equilibrium, $\psi_1(\theta; w_H) = \psi_2(\theta; w_H)$. Therefore,
i.e., the taxpayers’ payoffs decreases in $w_H$. Similarly,

$$
\frac{d\hat{w}(\theta, \tau)}{dw_H} = \frac{\partial \hat{w}(\theta, \tau)}{\partial w_H} + \frac{\partial \hat{w}(\theta, \tau)}{\partial \theta} \cdot \frac{\partial \theta}{dw_H} = \frac{\partial \hat{w}(\theta, \tau)}{\partial w_H} \cdot w_H + \frac{\partial \hat{w}(\theta, \tau)}{\partial \theta} \cdot \frac{\partial \theta}{dw_H} = \frac{\partial \hat{w}(\theta, \tau)}{\partial w_H} \cdot w_H + \varphi(\theta, \tau) + w_H \frac{\partial \varphi(\theta, \tau)}{\partial \theta} \cdot \frac{\partial \theta}{dw_H}
$$

$$
= \frac{\partial \varphi(\theta, \tau)}{\partial w_H} \cdot w_H + \varphi(\theta, \tau) = \left( 1 - \left( \theta^{-1} w^*(\theta) + w_H \right)^{-1} w_H \right) \varphi(\theta, \tau) > 0,
$$

since $\varphi(\theta, \tau) > 0$ and $1 - \left( \theta^{-1} w^*(\theta) + w_H \right)^{-1} w_H > 0$ if $\theta^{-1} w^*(\theta) > 0$ which holds. Thus, the office holder’s payoff increases in $w_H$. With respect to $v(\theta, \tau)$, we have that

$$
\frac{\partial v(\theta, \tau)}{dw_H} = \frac{\partial v(\theta, \tau)}{\partial w_H} \cdot w^*(\theta) + \varphi(\theta, \tau) \frac{\partial w^*(\theta)}{dw_H} = \frac{\partial v(\theta, \tau)}{\partial w_H} \cdot w^*(\theta) = - \left( \theta^{-1} w^*(\theta) + w_H \right)^{-1} v(\theta, \tau) < 0
$$

$$
\frac{\partial v(\theta, \tau)}{\partial \theta} = \frac{\partial v(\theta, \tau)}{\partial w_H} \cdot w^*(\theta) + \varphi(\theta, \tau) w^*(\theta) = \varphi(\theta, \tau) w^*(\theta) = \theta^{-1} \left( 1 - F(w^*(\theta)) \theta \right) v(\theta, \tau) > 0
$$

As to $\frac{\partial \theta}{\partial w_H}$, consider the equation $\hat{\psi}(\theta; w_H) = \psi_1(\theta; w_H) - \psi_2(\theta; w_H) = 0$ with both $\psi_1$ and $\psi_2$ as defined above. The conditions of the Implicit Function Theorem are satisfied at all $(\theta(w_H), w_H)$ so that $\frac{\partial \theta}{\partial w_H} = - \frac{\hat{\psi}_w H(\theta; w_H)}{\hat{\psi}_\theta(\theta; w_H)}$ on $(0, 1)$, or

$$
\frac{\partial \theta}{\partial w_H} = (1 - F(w^*(\theta)) \theta) \left[ \theta^{-1} w^*(\theta) F(w^*(\theta)) + w^*(\theta) f(w^*(\theta)) w^*(\theta) + F(w^*(\theta)) w_H + \theta f(w^*(\theta)) w^*(\theta) w_H \right.
$$

$$
+ \left( \int_{w^*(\theta)}^{1} w f(w) dw + (1 - F(w^*(\theta)) \theta) w_H \right) \left( - \theta^{-1} + \theta^{-1} (1 - F(w^*(\theta)) \theta)^{-1} + F(w^*(\theta)) \right) f(w^*(\theta)) w^*(\theta)
$$

$$
+ f(w^*(\theta)) w^*(\theta)^2 + w^*(\theta) f(w^*(\theta)) f(w^*(\theta)) + w^*(\theta) f(w^*(\theta)) w^*(\theta) + g^*(\theta) \right]^{-1} > 0,
$$

since $f'(w^*(\theta)) > 0$ as $w^*(\theta) < \tilde{w} \leq w_{mod}$. That is, enforcement $\theta$ is differentiable in $w_H$ and worsens with it for all $w_H > w_p$. This implies that all equilibrium payoffs, output, and welfare are differentiable with respect to $w_H$ for all $w_H > w_p$. Thus, $\frac{\partial v(\theta, \tau)}{\partial \theta} \cdot \frac{\partial \theta}{\partial w_H}$

$$
= \nu(\theta, \tau) \left[ w^*(\theta) F(w^*(\theta)) + \theta w^*(\theta) f(w^*(\theta)) w^*(\theta) + \theta F(w^*(\theta)) w_H + \theta^2 f(w^*(\theta)) w^*(\theta) w_H \right.
$$

$$
+ \left( \int_{w^*(\theta)}^{1} w f(w) dw + (1 - F(w^*(\theta)) \theta) w_H \right) \left( (1 - F(w^*(\theta)) \theta)^{-1} - 1 + \theta F(w^*(\theta)) \right) f(w^*(\theta)) w^*(\theta)
$$

$$
+ \theta f(w^*(\theta)) w^*(\theta)^2 + \theta w^*(\theta) f(w^*(\theta)) f(w^*(\theta)) + \theta w^*(\theta) f(w^*(\theta)) w^*(\theta) + \theta g^*(\theta) \right]^{-1}.
$$
Now, $\frac{d \nu(\theta, \tau)}{d w \theta} = \frac{\partial \nu(\theta, \tau)}{\partial w \theta} + \frac{\partial \nu(\theta, \tau)}{\partial \theta} < 0$ if $\frac{\partial \nu(\theta, \tau)}{\partial w \theta} > \frac{\partial \nu(\theta, \tau)}{\partial \theta}$ if

$$\theta^{-1} w^*(\theta) + w_H < w^*(\theta)F(w^*(\theta)) + \theta w^*(\theta)f(w^*(\theta))w^*(\theta) + \theta F(w^*(\theta))w_H + \theta^2 f(w^*(\theta))w^*(\theta)w_H$$

$$+ \left( \int_{w^*(\theta)}^1 w f(w) dw + (1 - F(w^*(\theta))w_H \right) \left( \frac{F(w^*(\theta))\theta}{(1 - F(w^*(\theta))\theta)} + \theta F(w^*(\theta))w^*(\theta)$$

$$\theta f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta) + \theta g''(\theta) \right)$$

$$- w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta)$$

\[ \Rightarrow (1 - F(w^*(\theta))\theta)\theta^{-1} w^*(\theta) + (1 - F(w^*(\theta))\theta)w_H < \theta^2 f(w^*(\theta))w^*(\theta)[\theta^{-1} w^*(\theta) + w_H]$$

$$+ \left( \int_{w^*(\theta)}^1 w f(w) dw + (1 - F(w^*(\theta))\theta)w_H \right) \left( \frac{F(w^*(\theta))\theta}{(1 - F(w^*(\theta))\theta)} + \theta F(w^*(\theta))w^*(\theta)$$

$$\theta f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta) + \theta g''(\theta) \right)$$

$$- w^*(\theta)f(w^*(\theta))w^*(\theta) - g'(\theta)$$

\[ \Rightarrow (1 - F(w^*(\theta))\theta)\left( \int_{w^*(\theta)}^1 w f(w) dw + (1 - F(w^*(\theta))\theta)w_H \right) < \left( \int_{w^*(\theta)}^1 w f(w) dw + (1 - F(w^*(\theta))\theta)w_H \right)$$

$$\times \left( \theta^2 f(w^*(\theta))w^*(\theta) + F(w^*(\theta))\theta + (1 - F(w^*(\theta))\theta)F(w^*(\theta))^{-1} f(w^*(\theta))w^*(\theta)$$

$$+ (1 - F(w^*(\theta))\theta) \theta f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta) + \theta g''(\theta) \right)$$

\[ \Rightarrow 1 < 2F(w^*(\theta))\theta + \theta F(w^*(\theta))^{-1} f(w^*(\theta))w^*(\theta)$$

$$+ (1 - F(w^*(\theta))\theta) \theta f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta)^2 + \theta w^*(\theta)f(w^*(\theta))w^*(\theta) + \theta g''(\theta) \right)$$

Since $\theta < \theta \leq \theta_{mod}$, the $f'(\theta^*) > 0$ so that the fraction on the right hand side is strictly positive. Thus, it is sufficient to show that $1 \leq 2F(w^*(\theta))\theta + \theta F(w^*(\theta))^{-1} f(w^*(\theta))w^*(\theta)$. However, $\theta F(w^*(\theta))^{-1} f(w^*(\theta))w^*(\theta) = \frac{f(w^*(\theta))w^*(\theta)}{f(w^*(\theta))w^*(\theta)(1 - F(w^*(\theta))\theta)} > 1 - F(w^*(\theta))\theta$. That is, it is sufficient to show that $\frac{f(w^*(\theta))w^*(\theta)}{f(w^*(\theta))w^*(\theta)} \geq 1$. Thus, it is sufficient to require $\frac{w f(w)}{F(w)} \geq 1$ or $w f(w) \geq F(w)$ for all $w \leq \bar{w}$. Since $\bar{w} \leq w_{mod}$, we have that $f'(w) \geq 0$ for all $w \leq \bar{w}$ and strictly so if $w < \bar{w}$. At $w = 0$, both sides are equal to zero. For all $w \in (0, \bar{w})$, the derivative of the left hand side is $f(w) + w f'(w) \geq f(w)$ which is the derivative of the right hand side. Hence, $w f(w) \geq F(w)$ holds, which establishes that appropriators’ payoffs decrease in $w_H$. Consequently, since the welfare functional is the sum of all taxpayers’ and appropriators’ payoffs, which decrease in $w_H$, welfare decreases in $w_H$. As to output, the derivative of $\theta(\theta)$ with respect to $\theta$ is given by $-w^*(\theta)f(w^*(\theta))w^*(\theta) < 0$. Thus, since $\frac{d \theta}{d w_H} > 0$ when $w_H > w_p$, the result obtains. Q.E.D.

E.3 The selection game given $\bar{N}$

Proposition 4

Proof. By a standard argument, a mixed strategy equilibrium exists under both timing assumptions. I conjecture there is a pure strategy equilibrium and attempt to find it by iterated elimination of (weakly) dominated strategies. Since $\nu^*(w) \leq \alpha$ for all $w \in [0, 1]$ and since $\bar{w}^d > \alpha$, for any $w_j \in \bar{N}$, if $n_j^d = 0$, then $w_j$ chooses to run, that is $\chi_j^d = 1$. Similarly, since $\nu^d(w) \leq \alpha$ for all $w \in [0, 1]$, if $n_j^d = 1$, then $w_j$ runs, i.e., $\chi_j^d = 1$, since not running yields the out-of-office payoff associated with some agent’s dictatorship while running yields at least $\bar{w}w_p > 0$. Thus, if $n_j^d \leq 1$, then $w_j$ runs. Assume that $\bar{N} \subset [0, w_p]$. Then, independent of who actually gets to run, the outcome is $(\theta^*, \tau^*) = (\theta_p, \tau_p)$ and all agents would be appropriators getting the best possible outcome they could get in any conceivable regime. Any (random) selection of agents of at least two agents into running is an equilibrium. Assume that
\[ \hat{N} \cap \{w_p, 1\} \neq \emptyset. \]

First, I argue that running is a (weakly) dominant strategy for \( w_1 \). Consider any strategy profile of the agents in \( \hat{N}_1 \). Assume \( n_1' > 1 \). Since \( w > w_1 \) for all \( w' \in \hat{N}_1' \), it holds that \( V(\theta(w'), \tau(w'); w') \geq V(\theta(w'), \tau(w'); w_1) \) for all \( w' \in \hat{N}_1' \) so that expected payoff from running is given by

\[
\sum_{w' \in \hat{N}_1'} \frac{2x_1(w')}{n_1'(n_1' + 1)} V(\theta(w'), \tau(w'); w_1) + \sum_{w' \in \hat{N}_1'} \frac{2}{n_1'(n_1' + 1)} V(\theta(w'), \tau(w'); w')
\]

\[
= \frac{n_1' - 1}{n_1' + 1} \sum_{w' \in \hat{N}_1'} \frac{2x_1(w')}{n_1'(n_1' - 1)} V(\theta(w'), \tau(w'); w_1) + \frac{2}{n_1' + 1} \sum_{w' \in \hat{N}_1'} \frac{1}{n_1'} V(\theta(w'), \tau(w'); w')
\]

\[
\geq \sum_{w' \in \hat{N}_1'} \frac{2x_1(w')}{n_1'(n_1' - 1)} V(\theta(w'), \tau(w'); w_1)
\]

which is the expected payoff from not running. The weak inequality derives from the convex combination since \( \sum_{w' \in \hat{N}_1'} \frac{2x_1(w')}{n_1'(n_1' - 1)} = 1 \) and \( \sum_{w' \in \hat{N}_1'} \frac{1}{n_1'} = 1 \). It is strict if \( \hat{N}_1' \cap \{w_p, 1\} \neq \emptyset \). Thus, given \( \hat{N}_1' \), \( n_1' > 1 \), \( w_1 \) weakly prefers to run. Since this holds for any strategy profile \( \hat{N}_1', w_1 \) has a weakly dominant strategy of running.

Consider agent \( w_2 \). Consider any strategy profile of the agents in \( \hat{N}_2 \). If \( w_1 \notin \hat{N}_2 \), then the analysis is exactly the same as for agent \( w_1 \) above. Thus, \( w_2 \) runs. Assume \( w_1 \in \hat{N}_2' \) and \( n_2' > 1 \). Then, since \( x_2(w_1) = 0 \) and \( V(\theta(w'), \tau(w'); w') \geq V(\theta(w'), \tau(w'); w_2) \) for all \( w' \in \hat{N}_2' \setminus \{w_1\} \) his expected payoff from running is given by

\[
\sum_{w' \in \hat{N}_2'} \frac{2x_2(w')}{n_2'(n_2' + 1)} V(\theta(w'), \tau(w'); w_2) + \frac{2}{n_2'(n_2' + 1)} V(\theta(w'), \tau(w'); w')
\]

\[
= \frac{n_2' - 1}{n_2' + 1} \sum_{w' \in \hat{N}_2'} \frac{2x_2(w')}{n_2'(n_2' - 1)} V(\theta(w'), \tau(w'); w_2) + \frac{2}{n_2' + 1} \left( \sum_{w' \in \hat{N}_2' \setminus \{w_1\}} \frac{1}{n_2'} V(\theta(w'), \tau(w'); w') \right)
\]

\[
= \frac{n_2' - 1}{n_2' + 1} \sum_{w' \in \hat{N}_2'} \frac{2x_2(w')}{n_2'(n_2' - 1)} V(\theta(w'), \tau(w'); w_2) + \left( 1 - \frac{n_2' - 1}{n_2' + 1} \right) \left( \sum_{w' \in \hat{N}_2' \setminus \{w_1\}} \frac{1}{n_2'} V(\theta(w'), \tau(w'); w') \right)
\]

\[
\geq \sum_{w' \in \hat{N}_2'} \frac{2x_2(w')}{n_2'(n_2' - 1)} V(\theta(w'), \tau(w'); w_2)
\]

which is the expected payoff from not running. The weak inequality derives from the convex combination since \( \sum_{w' \in \hat{N}_2'} \frac{2x_2(w')}{n_2'(n_2' - 1)} = 1 \), \( \sum_{w' \in \hat{N}_2' \setminus \{w_1\}} \frac{1}{n_2'} + \frac{1}{n_2'} = 1 \), and, by proposition 3, \( V(\theta(w_2), \tau(w_2); w_2) \geq V(\theta(w'), \tau(w'); w_2) \) for all \( w' \in \hat{N}_2' \setminus \{w_1\} \). It is strict if \( \hat{N}_2 \cap \{w_p, 1\} \neq \emptyset \). Therefore, \( w_2 \) weakly prefers selecting to run, independent of whether or not \( w_1 \)’s weakly dominated strategy is eliminated.

Assume that \( |\hat{N} \cap [0, w_p]| \leq 2 \). Then, all the above inequalities that are potentially strict are actually strict so that the dominance is strict. Next, consider agent \( w_n \). Consider any strategy profile of the agents in \( \hat{N}_n \) with \( w_1, w_2 \in \hat{N}_n' \). Note that \( w_n = \arg \max N \) and the important aspect is that \( n_n \geq 2 \) rather than \( w_1 \) and \( w_2 \) selected to run. Since, by proposition 3, \( V(\theta(w_n), \tau(w_n); w_n) \leq V(\theta(w'), \tau(w'); w_n) \) for all \( w' \in \hat{N}_n' \), his
expected payoff from running is
\[\sum_{w' \in \tilde{N}_h} \frac{2\pi_n(w')}{n(n' + 1)} V(\theta(w'), \tau(w'); w_n) + \sum_{w' \in \tilde{N}_h} \frac{2}{n(n' + 1)} V(\theta(w_n), \tau(w_n); w_n)\]
\[= \sum_{w' \in \tilde{N}_h} \frac{2\pi_n(w')}{n(n' + 1)} V(\theta(w'), \tau(w'); w_n) + n' \frac{2}{n(n' + 1)} V(\theta(w_n), \tau(w_n); w_n)\]
\[= \frac{n' - 1}{n' + 1} \sum_{w' \in \tilde{N}_h} \frac{2\pi_n(w')}{n'n(n_n - 1)} V(\theta(w'), \tau(w'); w_n) + \left(1 - \frac{n' - 1}{n' + 1}\right) V(\theta(w_n), \tau(w_n); w_n)\]
\[\leq \frac{2\pi_n(w)}{n(n_n - 1)} V(\theta(w'), \tau(w'); w_n),\]
which is his expected payoff from not running. The weak inequality derives from the convex combination since \(\sum_{w' \in \tilde{N}_h} \frac{2\pi_n(w')}{n_n(n_n - 1)} = 1\), so that \(\sum_{w' \in \tilde{N}_h} \frac{2\pi_n(w')}{n_n(n_n - 1)} V(\theta(w'), \tau(w'); w_n) \geq V(\theta(w_n), \tau(w_n); w_n)\). It holds strictly if \(w_n > w_p\) which is assumed. This implies that \(w_n\) prefers not to run. That is, given that \(w_1\) and \(w_2\) run, \(w_n\) has a strictly dominant strategy of not running.

Next consider agent \(w_{n-1}\). Consider any strategy profile of the agents in \(\tilde{N}_{n-1}\) with \(w_1, w_2 \in \tilde{N}_{n-1}\) and \(w_n \notin \tilde{N}_{n-1}\). The problem for \(w_{n-1}\) now looks exactly the same as the one for \(w_n\) above. Thus, analysis and result are the same so that not running weakly dominates running for \(w_{n-1}\). The same argument then holds for agents \(w_{n-2}, \ldots, w_3\). That is, only \(w_1\) and \(w_2\) select themselves into running and therefore run for office.

It can be verified that all agents other than \(w_1\) and \(w_2\) have no weakly dominated strategy if the ones of \(w_1\) and \(w_2\) are not deleted. They would choose to run if at most one of the agents with a smaller skill than themselves runs but refrain from doing so if at least two of them do so. By the very nature of the argument, any other strategy profile allows for profitable deviations. Therefore, the equilibrium is unique, \(w_1\) wins the election, \(w_2\) determines the outcome.

Assume that \(2 < |\tilde{N} \cap [0, w_p]| < n\). For all agents in \(\tilde{N}_n \cap [0, w_p] \setminus \{w_1, w_2\}\), the consideration parallels the one worked out for agents \(w_1\) and \(w_2\) above. That is, they also have a weakly dominant strategy of running and any subset of \(\tilde{N}_n \cap [0, w_p]\) can be part of the equilibrium selection. Any one of them wants to run if some agent \(w' > w_p\) wants to run in order to increase the probability of best possible outcomes. They are indifferent if only agents from that set want to run since they get the best possible appropriation payoff which equals the corresponding in-office payoff as the regime would be \((\theta_p, \tau_p)\). For all agents in \(\tilde{N}\) with \(w' > w_p\), then the argument parallels the one for agents \(w_n, w_{n-1}, \ldots, w_3\) in the above case. As a consequence, any subset selected from \(\tilde{N}_n \cap [0, w_p]\) is an equilibrium with the associated outcome \((\theta^*, \tau^*) = (\theta_p, \tau_p)\). Any strategy profile involving agents from \([w_p, 1]\) running allows for profitable deviations.

Q.E.D.

### E.4 Constraints to participation

#### E.4.1 Access to political competition

**Proposition 5**

*Proof.* First, in the selection game, the agent that determines the outcome is the second smallest element of the set \(N, w_2\). By proposition 3, the smaller \(w_2\), the better institutions and the higher welfare. It follows directly that anything that increases the second order statistic of the draws of potential candidates into the set \(N\).

Consider any \(z\) such that \(\Gamma(z) \in (0, 1)\) and \(\gamma(z) > 0\). Let \(\Gamma_2\) be the distribution of the second smallest element, the second order statistic. Then, \(\Gamma_2(z) = 1 - (1 - \Gamma(z))^n + \Gamma(z)(1 - \Gamma(z))^{n-1} n\). This can be rewritten to \(\Gamma_2(z) = 1 - (1 - \Gamma(z))^{n-1} (1 + (n - 1)\Gamma(z))\). Since \(\Gamma(z) \in (0, 1)\) and \(\gamma(z) > 0\), the derivative with respect to...
\[ \frac{\partial \Gamma_2(z)}{\partial n} = -(1 - \Gamma(z))^{n-1}(\Gamma(z) + (1 + (n - 1)\Gamma(z)) \log(1 - \Gamma(z))) > 0 \]

if and only if \( \frac{\Gamma(z)}{(1 + (n - 1)\Gamma(z))} < -\log(1 - \Gamma(z)) \). Fix \( n \). If \( \Gamma(z) = 0 \), both side of this inequality are equal to zero. The derivative of the left hand side with respect to \( z \) is
\[
\frac{\gamma(z)(1+(n-1)\Gamma(z))}{(1+(n-1)\Gamma(z))^2} = \frac{\gamma(z)}{(1+(n-1)\Gamma(z))^2} < \frac{\gamma(z)}{(1-\Gamma(z))^2} \]
which is the derivative of the right hand side with respect to \( z \). Hence, \( \frac{\partial \Gamma_2(z)}{\partial n} > 0 \). Therefore, the probability of \( w_2 \leq z \) and, thus, the probability of better institutions and higher welfare increases with \( n \).

Second, consider \( \bar{w} \) and \( \bar{w}' \), \( \bar{w} < \bar{w}' \). Since \( \Gamma' \) is a truncation of \( \Gamma \), \( \Gamma'(z) = \frac{\Gamma(z) - \Gamma(w)}{1 - \Gamma(w)} \) if \( z \geq \bar{w}' \) and \( \Gamma'(z) = 0 \) otherwise. Note that \( \Gamma'(z) = \Gamma(z) \) if \( \bar{w}' = \bar{w} \). Thus, \( \frac{\partial \Gamma'(z)}{\partial \bar{w}} = \frac{[1-(\Gamma(z))\gamma'(\bar{w})]}{|1-\Gamma'(\bar{w})|^2} \leq 0 \) and strictly so if \( \Gamma(z) < 1 \). Then,
\[
\frac{\partial \Gamma_2(z)}{\partial \bar{w}} = n(n-1)(1 - \Gamma(z))^{n-2}\Gamma'(z) \frac{\partial \Gamma'(z)}{\partial \bar{w}} \leq 0
\]
and strictly so if \( \Gamma(z) \in (0,1) \). Therefore, decreasing \( \bar{w} \) increases the probability of better institutions and higher welfare.

Finally, the second order statistics \( \Gamma_2(z) \) increase with \( \Gamma(z) \), since
\[
\frac{\partial \Gamma_2(z)}{\partial \Gamma(z)} = n(n-1)\Gamma(z)(1 - \Gamma(z))^{n-2} \geq 0
\]
and strictly so if \( \Gamma(z) \in (0,1) \). Since \( \Gamma' \) first order stochastically dominates \( \Gamma \), \( \Gamma(z) \geq \Gamma'(z) \) for all \( z \) and strictly so for some \( z \). The result follows.

Q.E.D.

### E.4.2 Qualified electorate or elites

#### Proposition 6

**Proof.** Given the regime \((\theta, \tau)\) chosen, the competitive equilibrium and, thus, payoffs depend only on the productivity distribution in the population. Thus, lemma 3 holds. Since \( \bar{\theta}' \geq \bar{\theta} \) and \( f_{\chi}(z,1) \) has full support, proposition 5 can be rewritten replacing \( \bar{w} \) by \( \bar{w}' \). The proof is exactly the same replacing \( \bar{\theta} \) with \( \bar{\theta}' \) and \( F' \) by \( F_\varepsilon \). It follows that the probabilities of winning are given by equations (19)-(21) using \( \bar{\theta}' \) and \( \bar{w}' \) instead of \( \bar{\theta} \) and \( \bar{w} \). For the same reasons, lemma 6 goes through, both as it is and with \( \bar{\theta}' \) replacing \( \bar{\theta} \). Then, all other results follow directly from the unaltered payoff structure.

Q.E.D.

### References


