Political Competition over Property Rights Enforcement[*]

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Abstract

I study what level of tax-financed property rights enforcement societies choose in elections when appropriators can steal from producers. Restrictions determine who can run for office. Candidates propose enforcement levels and tax rates. The election winner keeps the budget surplus. If the majority of voters are producers, then fewer restrictions on who can run for office are associated with more secure property rights. Lifting restrictions on who can run benefits producers, while lifting restrictions on who can vote does not. If the majority of voters are appropriators, then elections lead to adverse outcomes, irrespective of who can run for office.

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1 Introduction

The security of property rights matters for economic outcomes (e.g., Knack and Keefer 1995; Hall and Jones 1999). Why does it vary across countries? Much of the existing literature on property rights focuses on policies chosen by politically powerful groups (e.g., Acemoglu 2003, 2006, 2008).[1] However, most countries today choose policies based on how their population votes. In 2000, 170 countries held regular elections with on average 98.5% of the adult population eligible to vote.[2] But, as North et al. (2006, pp. 66-67) argue, "elections do not mean the same thing" across countries.[3] Given well-defined property rights, what determines the level of their enforcement chosen in elections? Why might this choice vary across countries?

North et al. (2006, p. 67) emphasize the role of political competition in how elections work; and elections are not equally competitive across countries. For the year 2000, 123 of those 170 countries with regular elections mentioned above allow for a direct comparison with Polity IV's measure of the *Competitiveness of Executive Recruitment*. In only 65 of them, executives were chosen by "election," in 27 by "selection," in 31 by an intermediate selection process. The least competitive category called "selection," as opposed to the most competitive category called "election," includes, e.g., "rigged, unopposed elections" as well as "selection within an institutionalized single party" (Marshall et al. 2016, p. 21). In this subset of 123 countries, Polity IV's *Competitiveness of Executive Recruitment* thus effectively measures the competitiveness of elections. Using this measure, in this set of countries, more competitive elections are associated with the perception of more secure property rights.[4]

This paper emphasizes one aspect of political competition: broad access to political activities. Societies with similar economic fundamentals may choose different outcomes in elections because they have different alternatives to choose from. These alternatives differ due to variations in restrictions on who can run for office. One example of such restrictions are formal property or educational qualifications for office as prevalent in history (e.g., Miller 1900). Another example is the importance of connections or status established by economic success or inheritance as still prevalent today (e.g., Dal Bó et al. 2009). The latter type of implicit restrictions encompasses the existence of narrow political elites in countries that hold elections in which virtually all adults can vote.

I first consider a situation in which producers constitute the majority of the voters. They produce with heterogeneous productivity, while others, the appropriators, who are the minority among voters, can "steal" from them. Here, I think of stealing as synonymous with

[1] For a prominent example focusing on agency problems, see Acemoglu and Verdier (1998).

[2] Data from Paxton et al. (2003), via Bruce Moon's web page: `http://www.lehigh.edu/~bm05/democracy/suffrage_data.html`. The authors require evidence of regular elections but do not judge their fairness (p. 95).

[3] See, e.g., Diamond (2002) on various concepts and classifications of electoral regimes and their prevalence.

[4] In this set of countries, the correlation of this measure with the World Bank's indicator *Rule of Law* is 0.55 (p-value $< 10^{-10}$). Polity IV data: Center for Systemic Peace, `http://www.systemicpeace.org/inscrdata.html`, variable *xrcomp*; *Rule of Law*: The World Bank, `http://info.worldbank.org/governance/wgi`.

activities like corruption, extortion, fraud, or outright theft that do not require special abilities and do not target specific groups. I assume that the act of producing output establishes the right to consume it and to exclude others from consuming it. Enforcing this right against appropriators makes property rights secure. I focus on public enforcement that is financed by taxation.[5] As an extreme case, one can think of a kleptocratic state as one in which severe taxation and unimpeded stealing prevail (e.g., Acemoglu et al. 2004).[6]

The level of enforcement regulates how much can be stolen. It is chosen by society in a political process. Political institutions determine a group of potential candidates who can run for office. Two of them choose to become candidates in electoral competition. They each propose a tax rate and a level of enforcement. Voters vote over the proposals to decide the outcome. The election winner enacts their proposal and collects the surplus of tax receipts over enforcement costs. I distinguish between two types of elites. First, the potential candidates are the political elite. The number of potential candidates captures how open and competitive the process of political selection is. A small number of potential candidates makes them a narrow elite. Second, the agents who can vote in the election are the qualified electorate. The size of the qualified electorate captures how broad the franchise is. A narrow franchise makes voters a narrow elite.

In this environment, the election winner can extract resources from the economy by raising high taxes and spending little on enforcement. However, they face endogenous constraints on their discretion. First, the tax rate and level of enforcement the winner commits to enact have to make producers, who are the majority among voters, at least as well off as those the loser proposes. At the same time, the winner wants to extract as many resources as possible, which reduces producer payoffs. Therefore, in equilibrium, the proposals are such that producers are indifferent, and appropriators cast the decisive votes for the winner. Second, the tax rate and level of enforcement the winner commits to enact cannot diminish the value of the loser's outside option too much. Otherwise, the loser is better off proposing a tax rate and a level of enforcement that win the election. Thus, in equilibrium, the tax rates and levels of enforcement the candidates propose for the election depend on the loser's outside option, which is characterized by their productivity. Different losers, with different productivity, induce different alternatives for voters to choose from and thus different outcomes. Two initially otherwise identical societies with different election losers choose different levels of enforcement and see different levels of property rights security.

In equilibrium, the two least productive potential candidates run for office. The winner is better off holding office. The loser's productivity imposes the tightest possible constraint on the winner's discretion, implying the highest possible payoffs for producers. More political

[5]See, e.g., Besley and Persson (2009, 2010) on state capacity for taxation and property rights enforcement. Herrera and Martinelli (2013) study investment in state capacity in oligarchic and democratic societies.

[6]Also see, for example, Olson (1993); Moselle and Polak (2001); Konrad and Skaperdas (2012).

competition in the sense of fewer restrictions on who can run for office decreases the productivity of the election loser. The value of the loser's outside option decreases for every tax rate and level of enforcement, which tightens the constraint on the winner's discretion. The model thus suggests that we should see more secure property rights in societies with more competitive political environments.[7] Allowing more people to run for office induces a favorable set of alternatives for voters to choose from. At the same time, given two alternatives, allowing more people to vote does not change the election outcome if producers remain the majority among voters. Producers are still indifferent, and appropriators still vote for the same alternative. Lifting restrictions on who can vote by itself may thus not affect the election outcome.[8]

In a situation in which appropriators constitute the majority of the voters, elections lead to no taxation and no enforcement at all, irrespective of how competitive they are. Appropriators prefer less enforcement, and enforcement is costly. Both candidates in the election thus have an incentive to propose enacting no enforcement. Appropriators also prefer lower taxes. Thus, competition for the office and the opportunity to extract resources from the economy drives the proposed tax rates to zero as well. This outcome is independent of the actual candidates. Lifting restrictions on who can run for office thus has no effect on the equilibrium outcome. To prevent adverse outcomes, democratic reforms to allow everyone to vote may need to be preceded by economic reforms to ensure that the majority of the population are producers.

The model can capture both decision making in narrow political elites and in elections in which virtually all adults can vote. It connects different outcomes in societies in which everybody can vote to the competitiveness of elections in the sense of implicit and explicit restrictions on who can run for office. If higher productivity in the model is interpreted to be positively correlated with more education or greater wealth, then the model offers a justification for lifting landholding, wealth, or literacy requirements for political activities (e.g., Miller 1900; also see Engerman and Sokoloff 2005 on voting rights).

I discuss the related literature in Section 2, describe the model in Section 3, present its predictions in Section 4, and discuss my assumptions and the robustness of the model predictions in Section 5, before I conclude.

2 Related Literature

My setup shares a selection stage with citizen-candidate models introduced by Osborne and Slivinski (1996) and Besley and Coate (1997). However, I assume that candidates can commit

[7] More generally, Besley et al. (2010) argue that competition may lead political parties to choose policies that further economic performance and growth. They find evidence supporting their argument in U.S. data. Padovano and Ricciuti (2009) find similar results using data from Italy. Svaleryd and Vlachos (2009) study the effects of both political competition and media coverage on political rents in Sweden.

[8] The economic mechanisms at work in models of the extension of voting rights, like, e.g., Acemoglu and Robinson (2000, 2001), Lizzeri and Persico (2004), and Gradstein (2007) are absent here.

to electoral platforms as they otherwise implement outright dictatorship once in office.[9] I therefore have a second stage in which political competition gives rise to a second strategic interaction that would be absent otherwise. Messner and Polborn (2004), for example, model a set of potential candidates for (a potentially unattractive) office who differ both in competence and in their privately known exogenous opportunity costs or office benefits. In this model, the authors rationalize some restrictions on who can run for certain (unattractive) positions to prevent outcomes with only bad candidates. In my model, potential candidates differ with respect to the productivity of the project they execute when not in office. Both the rents from holding office—which are extracted from society—and the office holder's opportunity costs arise endogenously from the second strategic interaction in electoral competition. My results suggest that, in the context of this paper, restrictions on who can run for office should be lifted to constrain the office holder's discretion over rent extraction.

Corvalan et al. (2018) study redistribution in a citizen-candidate model in which citizens differ with respect to their wealth, and in which distinct wealth requirements determine who can vote and who can run for office. They find that an extension of voting rights may not have an effect on the extent of redistribution that is implemented unless eligibility requirements for office are relaxed. In my paper, the context is not redistribution but the security of property rights. Given the nature of the context here and in contrast to the environment in Corvalan et al. (2018), an individual's preferred regime depends on their role in society. The same potential candidate who prefers low taxes and high enforcement expenditures when a private citizen prefers high taxes and low enforcement expenditures when in office. As a consequence, a strategic interaction arises that Corvalan et al. (2018) cannot study.

Acemoglu (2005) models a self-interested ruler who raises taxes from citizens to spend some of the receipts on a productive public good and consume the rest. The political institutions threaten the ruler with replacement in the future if their chosen policies are not in the citizens' interests, i.e., if the taxes are too high. If it is very costly to replace the ruler, then they can extract high rents by raising high taxes, which discourages private investment. If it is very low-cost to replace the ruler, then they invest very little in productive public goods because they cannot raise high taxes to collect high rents in the future. Economic performance is poor in both cases. Better economic performance requires balanced political institutions. By contrast, I focus on constraints on the office holder's policy choice that arise from competition in the political arena beforehand. Political institutions determine how competitive the political arena is, which effectively determines what amounts to too much rent extraction. A more competitive political arena tightens the constraints on the office holder's discretion over rent extraction. Therefore, political institutions that provide for a more competitive political arena unambiguously improve outcomes.

[9] The model generates in-office rents from weak institutions and kleptocratic states nonetheless.

This paper differs from the work by Persson et al. (1997, 1998, 2000). They study the extent to which separation of powers (with checks and balances) and institutions that foster legislative cohesion affect the provision of public goods, targeted transfers, and the rents that politicians can capture in representative democracies. They explore how the allocation of proposal and decision rights once office holders are in place, together with retrospective voting, affects the political outcome by generating conflicts of interests between political agents, which voters can exploit for their benefit. By contrast, I focus on cross-countries differences in the nature of elections used to recruit office holders—specifically, how competitive they are, as determined by restrictions on who can run for office—and how they can lead to different outcomes across countries. The policy dimension I focus on is neither a public good that all voters value the same or in a similar way nor redistribution but tax-financed property rights enforcement. Therefore, the conflict of interests among voters is different as well. Both appropriators and producers agree that they prefer low taxes, but appropriators want as little enforcement as possible, while producer want a lot of it.

Focusing on a different economic mechanism, Cao and Lagunoff (2020) study the evolution of property rights and the wealth distribution in autocracies. Their environment features an asset that can be owned both publicly and privately. An autocrat linked to a ruling group assigns property rights to determine the division of the asset between public and private property, the distribution of private property among citizens, and the enforcement of restrictions on the use of public property. When choosing this assignment, the autocrat faces the constraint that all citizens whose property is affected by a change to the status quo have to consent to it. The authors find among other things that the autocrat eventually uses an enforcement gap that arises in the absence of consent to systematically appropriate both public property and private property from those outside the ruling group. Their results rest on the interaction of the consent constraint and the autocrat's inability to commit to a stable rule of law.

One of my main results is that a broader political elite may lead to more secure property rights. Being producers, many members of the political elite would thus support lifting restrictions on who can run for office. This implication is reminiscent of the support among an elite for lifting restrictions on who can vote in Lizzeri and Persico (2004), which rests on a different mechanism. There, expanding the elite by lifting restrictions on who can vote reduces the fraction of voters who can be captured with targeted redistribution. Providing public goods thus becomes relatively more attractive to politicians, which may benefit the majority of the initial elite. Here, by contrast, lifting restrictions on who can run for office allows for candidates with less productive outside options, which ultimately tightens the constraints on the election winner's discretion. However, this mechanism rests on a large enough fraction of the population engaging in productive activities rather than appropriation.

The intuition of the outcome of the political game here is related to the one described by Gersbach (2009) in a citizen-candidate model with a focus on politician remuneration.

In his environment, candidate politicians propose their wage in office. In equilibrium, a more competent candidate collects a rent determined by the exogenous competence of the competitor. The proposed wage is just high enough to make the voters indifferent between the candidates. In my model, the candidate with the less productive project collects a rent that depends on both the productivity of the competitor's project and the endogenous policy outcome. The election winner makes the election loser indifferent between being in office and not being in office.

3 The Model

The Environment. There is a finite number $p + a + 1$ of risk neutral agents. Except for one idle individual, each agent belongs to one of two mutually exclusive groups of p producers and a appropriators. There are (at least three) more producers than appropriators: $p - 2 > a > 0$.[10]

Each of the p producers has one of p projects with publicly observable, heterogeneous productivities collected in the set $\mathcal{W} = \{w_1, w_2, \ldots, w_p\}$, where $w_{i+1} > w_i > 0$ for all $i = 1, \ldots, p-1$. I often refer to a specific producer using the productivity of the associated project. A project produces a quantity equal to its productivity of the consumption good. To simplify notation, I normalize aggregate output to one, i.e., $\sum_i w_i = 1$.[11] Producer w_i's income are the proceeds accruing to their project, w_i. They pay proportional taxes with rate $\tau \in [0, 1]$ on their income w_i and are expropriated of a fraction $\theta \in [0, 1]$ of their after-tax income $(1 - \tau)w_i$. That is, producer w_i consumes $(1 - \theta)(1 - \tau)w_i$.

The a appropriators engage in a sector that is responsible for appropriating the fraction θ of all after-tax income in the economy before it can be consumed. Each appropriator receives some fixed strictly positive share of all appropriated resources so that the shares add up to one. Equal shares are a special case. Unequal shares reflect the varying effectiveness of different appropriation activities as well as, possibly, connections to and roles within a corrupt elite.

Enforcing the rights to a fraction $(1 - \theta)$ of after-tax income costs society $g(1 - \theta)$, where $g : [0, 1] \to \mathbb{R}_+$ is twice continuously differentiable, strictly increasing, with derivative $g'(1 - \theta) > 0$, and strictly convex, with second derivative $g''(1 - \theta) > 0$, on $(0, 1)$. Perfect enforcement is too costly, $\lim_{(1-\theta)\to 1} g(1 - \theta) = g(1) \geq 1$; none is costless, $\lim_{(1-\theta)\to 0} g(1 - \theta) = g(0) = 0$.[12]

The Political Process. Society must choose the secure fraction $(1 - \theta)$ and the tax rate τ to raise the funds to pay for it in a political process. At the outset, a number $n \leq p$ of producers associated with the most productive projects are presented with an opportunity to actively engage in the political arena. They belong to the set of potential candidates,

[10] I discuss the case of $p - 2 < a$ in Section 4.6.

[11] The assumption that output is fixed is not essential for the main results (those for a producer majority) because they rest on the role of outside options. I discuss and relax this assumption in the online appendix.

[12] Small enough fixed costs can be accommodated with minor adjustments in some steps of the proofs.

$N = \{w_1^N, \ldots, w_n^N\} = \{w_{p+1-n}, \ldots, w_p\} \subseteq \mathcal{W}$, who can choose to run for office. Running is costless. All other producers, all appropriators, and the idle individual cannot run for office.[13]

All agents in N decide whether or not they want to run for office. The productivities of the projects of all agents in N, the environment, and the below structure of the game are common knowledge among all agents in N. If there is no candidate for office, then "anarchy" prevails, i.e., no taxes are collected, and no enforcement is put in place. If there is only one candidate, then that agent becomes a dictator. I provide the details for these two cases in Section 4.2 below. 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 who want to run, then two of them are selected to run in the election by an equal-probability random draw. I refer to the candidates as w_L and w_H, respectively, where $w_L < w_H$. They compete by simultaneously proposing and committing to enact a regime consisting of a proportional tax rate τ and a level of enforcement $(1-\theta)$, where $(\theta, \tau) \in [0,1]^2$. I refer to the regimes the candidates w_L and w_H propose as (θ_L, τ_L) and (θ_H, τ_H), respectively. All noncandidate producers and appropriators can vote in the election. Candidates and the idle individual cannot vote.[14]

After the proposals have been announced, a preference shock realizes. With probability $\varepsilon > 0$, producers who are indifferent between the proposed regimes prefer a candidate who is public-spirited: a candidate who is running for office even though they are worse off being in office with any regime that makes producers at least as well off as their opponent's proposal than losing and being a private citizen. One may think of such a candidate as being perceived as displaying a particularly strong dedication to public service and a willingness to forego a higher payoff as a private citizen in order to provide society with property rights enforcement.[15] If both or none of the candidates are public-spirited, then no candidate has an advantage. With probability $(1-\varepsilon) > 0$, only the proposed regimes matter to voters. Then, voters vote sincerely for one candidate or abstain if they are indifferent. The candidate who receives the majority of all votes cast wins the election. Ties are split with a fair coin. The assumption that $p - 2 > a$ implies that the majority of voters are producers.

The election winner serves as full-time office holder. An agent w_i who is selected for office must give out the project to the idle individual, who will execute it and acquire the proceeds $(1-\theta)(1-\tau)w_i$. One can think of this assumption as presidents either being too busy to run a business while in office or having to divest from it to reduce the potential for an actual or perceived conflict of interest. Being unable to execute it, the project has no value to the election winner, which allows the idle individual to acquire it at no cost. What matters is

[13]The assumption that appropriators cannot run for office simplifies the analysis and exposition. It is consistent with the idea that passing some sort of background check is a minimum requirement for a candidacy.

[14]This assumption rules out knife-edge cases that unnecessarily convolute the exposition and proofs. It is immaterial in the sense that a sufficient alternative assumption is that the population is large and $p - 5 > a$.

[15]This preference shock may thus make a possible element of candidate valence a tie-breaker for indifferent producers. It does not affect the characteristics of equilibrium of this stage. See Section 5.1 for a discussion.

Table 1

Stages and Timing

Stage 1: Selection Game	Stage 2: Political Game	Stage 3: Underlying Economy
1.) The set N is fixed.	1.) w_L and w_H propose regimes.	1.) Producers produce, pay taxes.
2.) The agents in N select candidates w_L and w_H.	2.) The shock realizes.	2.) Enforcement is set up.
	3.) The office holder is elected.	3.) Appropriation takes place.
	4.) The regime is enacted.	4.) All agents consume.

that the election winner has to give up the project proceeds when accepting public office and that total output remains unaffected to avoid second-order issues.[16] The office holder's payoff $\tilde{w}$ equals total tax receipts minus the cost of implementing $(1-\theta)$. It is not subject to taxation or appropriation—e.g., because the security around the president is generally high. The election loser executes their productive project, given the regime enacted by the winner.

The Timing. Table 1 summarizes the timing. At the outset, the potential candidates are fixed. They decide whether or not to enter the electoral competition to determine two candidates who run for office. Then, the two candidates propose regimes and, after the preference shock is realized, the qualified electorate votes over the alternatives presented. The majority winner enacts the proposed regime. Thereafter, producers execute their projects, generate income, and pay taxes. Then, enforcement is implemented. After that, the appropriation sector appropriates resources from producers and distributes them. Finally, all agents consume.

4 Analysis

The economy evolves in three stages: the selection game given a set of potential candidates, the political game given two candidates, and the underlying economy given a regime. I take the economic fundamentals summarized by the set of project productivities $\mathcal{W}$ and the enforcement technology g as given. The equilibrium concept is subgame perfect equilibrium: All potential candidates' decisions to run for office are best responses to all other potential candidates' decisions, taking as given that each candidate's regime proposal in the political game is a best response to the other candidate's regime proposal. I solve the model backwards. I first describe the underlying economy given any regime (θ, τ) and the outcome under anarchy, dictatorship, and direct democracy. Then, I study the choice of (θ, τ) in the political game given the productivities of the candidates' projects. Finally, I analyze the selection from potential candidates to candidates and the effects of changes in the underlying political

[16]The assumption that the office holder has to give up all project proceeds is not essential (see Section 5.4).

institutions. I specify the available strategies, the payoffs these map into, and the definition of equilibrium of the respective stage along the way. I collect all proofs in the appendix.

4.1 The Economy Given a Regime

The payoff of producers is determined by a payoff factor that can be captured by the quasiconcave function $\varphi : [0,1]^2 \to [0,1]$, given by $\varphi(\theta,\tau) = (1-\theta)(1-\tau)$, and the productivity of their project. Given a regime (θ,τ), a producer w_i's payoff is

$$\varphi(\theta,\tau)w_i = (1-\theta)(1-\tau)w_i. \tag{1}$$

By taking over and executing the office holder's project, the idle individual becomes a producer, and aggregate output is 1. The resources that the appropriation sector acquires and distributes to its members are given by the quasiconcave function $\nu : [0,1]^2 \to [0,1]$,

$$\nu(\theta,\tau) = \theta(1-\tau). \tag{2}$$

Every appropriator receives a strictly positive share of $\nu(\theta,\tau)$ so that the shares add up to one. The office holder's payoff is given by the strictly concave function $\tilde{w} : [0,1]^2 \to \mathbb{R}$,

$$\tilde{w}(\theta,\tau) = \tau - g(1-\theta).$$

The office holder keeps all of the collected taxes, τ, that they do not spend on enforcing agents' property rights to the fraction $(1-\theta)$ of their after-tax income, which costs $g(1-\theta)$. I ignore the constraint that $\tau \geq g(1-\theta)$ as it never binds.

From (1) and (2) follows that producers and appropriators have aligned preferences on τ and opposed preferences on θ. On the interior of their domain, all else equal, the payoffs of both producers and appropriators decrease in τ so that they both prefer lower taxes. Similarly, the payoffs of producers decrease in θ so that they prefer more enforcement $(1-\theta)$, while the payoffs of appropriators increase in θ so that they prefer less enforcement.

4.2 Anarchy, Dictatorship, and Direct Democracy

In anarchy, no taxes are collected, and no enforcement is enacted. The anarchy regime is $(\theta^a,\tau^a) = (1,0)$. In this case, property rights are perfectly insecure. Producers have a payoff of zero, while appropriators have a positive payoff as they share all output amongst them.

The political process may deliver a dictator whose problem is to maximize in-office payoff,

$$\max_{(\theta,\tau)\in[0,1]^2} \tilde{w}(\theta,\tau).$$

The solution is $(\theta^d, \tau^d) = (1, 1)$. The dictator taxes away all production and does not enact any enforcement whatsoever. The associated payoff is $\tilde{w}^d = \tilde{w}(\theta^d, \tau^d) = 1$. Producers and appropriators consume nothing. The dictator is rich, while the population is poor.

In a direct democracy, the enacted regime would maximize the payoffs of the agents in the majority group, subject to budget balance. An appropriator majority chooses anarchy. A producer majority chooses some taxation and enforcement.

4.3 The Political Game Given Two Candidates

In this section, I show that the candidate with the less productive project wins the election, but the enacted regime is dictated by the productivity of the loser's project. Thus, the set of alternatives voters face depends on and changes with the loser, which leads to different regimes and outcomes given the same fundamentals and office holder. I first specify strategies and payoffs and define the equilibrium of the subgame, which I then describe. Recall that the candidates and the regimes they propose are w_L, w_H, (θ_L, τ_L), and (θ_H, τ_H), where $w_L < w_H$.

4.3.1 Strategies, Payoffs, and Subgame Equilibrium Definition

Facing the proposals (θ_L, τ_L) and (θ_H, τ_H), voters evaluate the associated payoffs. Let (θ_k, τ_k) be the regime proposed by candidate w_k, $k \in \{L, H\}$. Let (θ_{-k}, τ_{-k}) be the regime proposed by candidate w_{-k}, $-k \in \{L, H\} \setminus \{k\}$. Noncandidate producers vote for (θ_k, τ_k) if

$$\varphi(\theta_k, \tau_k) > \varphi(\theta_{-k}, \tau_{-k})$$

and, disregarding the preference shock, abstain if

$$\varphi(\theta_k, \tau_k) = \varphi(\theta_{-k}, \tau_{-k}).$$

Similarly, appropriators vote for (θ_k, τ_k) if

$$\nu(\theta_k, \tau_k) > \nu(\theta_{-k}, \tau_{-k})$$

and abstain if

$$\nu(\theta_k, \tau_k) = \nu(\theta_{-k}, \tau_{-k}).$$

Let $P(\sigma_k, \sigma_{-k}; w_k, w_{-k}) = Prob\{w_k \text{ wins} \,|\, w_k, w_{-k}, (\theta_k, \tau_k), (\theta_{-k}, \tau_{-k})\}$ be the probability that candidate w_k wins the election against candidate w_{-k}, given their projects' productivities w_k and w_{-k} and their proposals $\sigma_k = (\theta_k, \tau_k)$ and $\sigma_{-k} = (\theta_{-k}, \tau_{-k})$. This probability equals one if $\varphi(\theta_k, \tau_k) > \varphi(\theta_{-k}, \tau_{-k})$ and zero if $\varphi(\theta_k, \tau_k) < \varphi(\theta_{-k}, \tau_{-k})$ because the votes of noncandidate producers, who constitute the majority among voters, ensure the win, irrespective of appropriators' votes. If $\varphi(\theta_k, \tau_k) = \varphi(\theta_{-k}, \tau_{-k})$, then producers are indifferent between the regimes. Then, there can be a role for the preference shock. If exactly one candidate is worse off being in office with any regime that makes producers at least as well off as the opponent's proposal than losing and being a private citizen, then there is a probability $\varepsilon > 0$ that noncandidate producers vote for this candidate, who thus wins the election. Otherwise, the regime preferred by appropriators wins the election, while ties are split by a fair coin.

Candidate w_k, $k \in \{L, H\}$, proposes (θ_k, τ_k) to maximize their expected payoff and solve

(PP)

$$\max_{(\theta_k,\tau_k)\in[0,1]^2} \{P(\sigma_k, \sigma_{-k}; w_k, w_{-k})\tilde{w}(\theta_k, \tau_k) + (1 - P(\sigma_k, \sigma_{-k}; w_k, w_{-k}))\varphi(\theta_{-k}, \tau_{-k})w_k\}.$$

The objective is the sum of the in-office payoff the proposal implies when winning weighted by the probability of winning and the out-of-office payoff under the opponent's proposal when losing weighted by the probability of losing. An equilibrium of this stage is defined as follows.

Definition 1. *Given two candidates w_L and w_H, an equilibrium of the political game is a set of proposals $\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}$ such that for all $k \in \{L, H\}$, given (θ_{-k}, τ_{-k}), $-k \in \{L, H\} \setminus \{k\}$, (θ_k, τ_k) solves Problem (PP).*

4.3.2 Equilibrium of the Political Game Given Two Candidates

The following proposition characterizes the equilibrium of the political game.

Proposition 1. *(1) Given two candidates w_L and w_H, the political game has an equilibrium, and the winning regime is unique. Candidate w_L wins the election with certainty, while candidate w_H proposes more enforcement: $(1 - \theta_H) > (1 - \theta_L)$. (2) The equilibrium regime (θ_L, τ_L) only depends on the loser's productivity w_H. A higher w_H implies less enforcement $(1 - \theta_L)$, lower producer payoffs via a lower $\varphi(\theta_L, \tau_L)$, and a higher office-holder payoff $\tilde{w}(\theta_L, \tau_L)$.*

There are multiple equilibria in the sense that the losing regime (θ_H, τ_H) is indeterminate (I discuss this implication in more detail in Section 5.1). However, the winning regime (θ_L, τ_L) is the single relevant object, and it is unique. Producers are indifferent between the proposed regimes. They constitute the majority of voters. A candidate whose regime proposal makes producers strictly better off than the alternative thus wins the election with certainty. However, this candidate can increase their payoff. They can raise the tax rate by a small enough amount to still win the election with certainty while extracting more resources from the economy. Therefore, in equilibrium, both regimes offer the same payoff to producers, who thus abstain. Instead, the votes of the appropriators in the electorate decide the election. The winning regime is the one that offers them the higher payoff. It does so by proposing less enforcement. Thus, the role of appropriators is twofold. They create the need for property rights enforcement to begin with. They also cast the decisive votes that lead society to choose the alternative that enacts less enforcement, despite being a minority among voters.

The office holder can extract resources from the economy by setting high taxes and offering low enforcement expenditures. The loser constrains the office holder's discretion on such extraction through two channels. First, the loser's proposal gives voters an alternative the winner's proposal has to beat. Second, the winner's regime proposal is constrained by the loser's outside option. In equilibrium, the loser has to weakly prefer losing the election and executing their project under the regime enacted by the winner to proposing a regime that at least ties the election. Therefore, the winner cannot set "too high" taxes and divert "too much" of the receipts away from their use in enforcement. High taxes and weak enforcement give the winner a high in-office payoff but offer the loser a low payoff in production. Once this payoff from production is too low, relative to the winner's in-office payoff, the loser wants to get into office. In equilibrium, this constraint is binding, and the winning regime only depends on the productivity of the loser's project, which thus determines the equilibrium regime. It follows that two economies with the same technology, the same set of productive projects, and the same office holder may choose to implement different regimes. Different election losers lead to different alternatives facing the respective voters, who then choose different outcomes.

Candidate w_L wins the election because candidate w_H has the better project and thus faces higher opportunity costs. In equilibrium, the winner's in-office payoff cannot be greater than the loser's payoff in production under the winner's regime. Otherwise, the loser could propose a regime to win the office with a higher payoff. Therefore, in any scenario in which candidate w_H wins the election, the associated in-office payoff is constrained by candidate w_L's outside option, whose project is less productive. That is, rather than holding office, w_H would prefer to execute their project under the regime put in place. Thus, in equilibrium, w_H loses the election and produces, while w_L holds office for a payoff that w_H would accept, too,

$$\tilde{w}(\theta_L, \tau_L) = \varphi(\theta_L, \tau_L) w_H. \tag{3}$$

The fact that the productivity of the loser's project determines the equilibrium regime has implications for variations in the loser's productivity. Given any regime, a candidate with a more productive project requires a higher in-office payoff to be indifferent between holding office and executing the project. Facing an opponent who requires a high in-office payoff allows the candidate who eventually wins the election to also ask for a higher in-office payoff—setting high taxes and diverting a lot of resources, which lowers production payoffs—than in a case where the opponent requires a rather low payoff to hold office. That is, with a worse outside option, the loser requires a lower in-office compensation to be indifferent. The winner faces a tighter binding constraint, which restricts discretion more and leads to a favorable set of alternatives the electorate can choose from. Therefore, the less productive the loser's project is, the more secure are property rights and thus the higher are producer payoffs.

This result suggests that societies whose leaders and runners-up (or, more generally, politicians) do not have too high out-of-office earning potentials (before any effects of having served in office), relative to the population, should do better than societies whose political leaders have extremely high relative earning potentials. It does not say that we should expect to see uneducated or unskilled political leaders.[17] In addition, ignoring economic fundamentals, one might expect only small differences among established democratic societies but larger differences between those and autocratic or oligarchic societies. In the latter, the earning potential of the political elites and their associates is likely relatively higher, compared to the rest of the population, than in the former. Finally, the office holder's payoff increases with the loser's productivity. That is, in societies with weak enforcement and insecure property rights in equilibrium, office holders capture high payoffs. This implication is consistent with anecdotal evidence that autocrats tend to accumulate relatively more wealth while in office than leaders in established democratic societies (e.g., Acemoglu et al. 2004).

The majority rule equilibrium here is induced by the institutional structure of the political process, a possibility pointed out by Plott (1967) and emphasized by Shepsle and Weingast (1981). While the candidates have no incentive to deviate, there exist regimes in the policy space that would command a majority over the winning proposal. Every regime that increases the payoff of producers would win the election. In fact, being a producer, the loser would prefer such a regime. However, proposing it would guarantee an in-office payoff that is strictly less than the payoff the loser gets from production under the currently winning regime. No agent who is not a candidate can propose it. The winner has no incentive to propose it and, in fact, would like to extract more resources. Trying to do so, however, means to lose the election and being left with a payoff from production that is strictly less than the in-office payoff associated with the initially winning proposal. Thus, nobody can profitably deviate.

Given the outcome of the political game between any two candidates, I can analyze the selection of potential candidates into electoral competition.

4.4 The Selection Game Given a Set of Potential Candidates

At this stage, all potential candidates want agents with rather unproductive projects to run because election losers with worse outside options imply preferred outcomes. Thus, in equilibrium, the two potential candidates with the least productive projects run for office. I first specify strategies and payoffs and define the equilibrium of the subgame to then analyze it.

[17] See Caselli and Morelli (2004) on the selection of "bad politicians" for positions in public offices.

4.4.1 Strategies, Payoffs, and Subgame Equilibrium Definition

Every potential candidate $w_j^N \in N = \{w_1^N, \ldots, w_n^N\}$ chooses to run, $\chi_j = 1$, or not, $\chi_j = 0$. A strategy profile can be summarized by the set $N' = \{w_j^N \in N : \chi_j = 1\}$ of all potential candidates who choose to run. Let $N_j' = N' \setminus \{w_j^N\}$ and $n_j' = |N_j'|$, respectively, denote the set and the number of potential candidates other than w_j^N who choose to run. Let $x(w', N_j')$ denote the number of selections of two candidates from them that lead to w' determining the regime. Let $(\theta(w'), \tau(w'))$ denote the regime determined by w'. Finally, let $\pi(\hat{n})$ be the probability that any particular two of $\hat{n}$ potential candidates who choose to run are selected to compete for office. Given any strategy profile N_j', w_j^N's expected payoff of not running is

$$V_0(N_j', w_j^N) = \begin{cases} 0 & \text{if } n_j' \leq 1, \\ \sum_{w' \in N_j'} \pi(n_j') x(w', N_j') \varphi(\theta(w'), \tau(w')) w_j^N & \text{if } n_j' > 1. \end{cases} \tag{4}$$

The expected payoff of not running is zero if at most one other potential candidate chooses to run. In this case, not running implies either anarchy or a dictatorship. If at least two other potential candidates choose to run, then it is the sum of w_j^N's production payoffs associated with all regimes that can arise in the election, weighted by the probabilities of these regimes arising. Similarly, given any strategy profile N_j', w_j^N's expected payoff of running is

$$V_1(N_j', w_j^N) = \begin{cases} \tilde{w}^d & \text{if } n_j' = 0, \\ \pi(n_j'+1)\Bigg[\sum_{w' \in N_j'} x(w', N_j') \varphi(\theta(w'), \tau(w')) w_j^N \\ \quad + \sum_{\substack{w' \in N_j' \\ w' > w_j^N}} \varphi(\theta(w'), \tau(w')) w' + \sum_{\substack{w' \in N_j' \\ w' < w_j^N}} \varphi(\theta(w_j^N), \tau(w_j^N)) w_j^N \Bigg] & \text{if } n_j' > 0. \end{cases} \tag{5}$$

If no other potential candidate chooses to run, then running makes w_j^N a dictator with payoff $\tilde{w}^d$. If at least one other potential candidate chooses to run, then the expected payoff of running consists of three parts. The first part collects w_j^N's production payoffs associated with all regimes that can arise in elections in which w_j^N is not a candidate. Each such payoff is weighted by the probability that w_j^N does not compete in the election and the regime arises. The second part collects w_j^N's in-office payoffs associated with all regimes that can arise in elections that w_j^N wins. By (3), these payoffs equal the respective election loser's production payoffs given the regime determined by them. Each such payoff is weighted by the probability that the respective election loser and w_j^N are selected as the two candidates to run for office. The third part collects w_j^N's production payoff associated with the regime that arises in elections that w_j^N loses, which is determined by w_j^N. This payoff is weighted by the probability that w_j^N and someone who wins the election against them are selected as the two candidates to run for office. Combining (4) and (5), w_j^N chooses χ_j to solve

$$\text{(SP)} \qquad \max_{\chi_j \in \{0,1\}} (1-\chi_j)V_0(N'_j, w_j^N) + \chi_j V_1(N'_j, w_j^N).$$

An equilibrium of the selection game is defined as follows.

Definition 2. *Given a set N of potential candidates, an equilibrium of the selection game is a set N' such that for all $w_j^N \in N$, given N'_j, χ_j solves Problem (SP).*

4.4.2 Equilibrium of the Selection Game Given a Set of Potential Candidates

The following result characterizes the equilibrium outcome of the selection game.

Proposition 2. *Given a set N of potential candidates, the selection game has a unique equilibrium $N' = N$ if $|N| \leq 2$ and $N' = \{w_1^N, w_2^N\}$ otherwise.*

While every potential candidate strictly prefers running for office to enduring anarchy or a dictatorship, by giving them a positive probability of competing for office, running increases the otherwise low expected payoffs of agents with unproductive projects. Potential candidate w_1^N wins every election they get to compete in and secures an in-office payoff equal to the more productive loser's production payoff under the resulting regime. Similarly, potential candidate w_2^N wins every election, except one against w_1^N. When winning the election, w_2^N similarly secures an in-office payoff equal to the more productive loser's production payoff under the resulting regime. When losing against w_1^N, since w_2^N has the least productive project an election loser can have, they get the highest payoff from executing their project that is possible. Thus, w_1^N and w_2^N run. All other potential candidates refrain from running so as to guarantee that w_1^N and w_2^N compete, which maximizes everyone's production payoff. The equilibrium is unique, and w_1^N wins the election, while w_2^N determines the outcome.

4.5 Political Institutions

A full equilibrium with a unique outcome exists because it does at each stage. In this section, I focus on political institutions that determine certain elite groups within society. I refer to those agents who can run for office as the political elite and to those agents who are entitled to vote as the qualified electorate. This way, I distinguish between voters and those who can participate in the process that determines the alternatives voters can choose from. At the same time, both the political elite and the qualified electorate represent concepts of elite. An important aspect of elites is that its members are "well-connected," which is likely to result in higher returns to market activity.[18] I therefore assume that the political elite consists entirely of producers, and the majority of voters in any restricted qualified electorate are producers as well. I show that in this model, more political competition, even within a narrow elite who can vote, leads to better outcomes, while allowing more people to vote, without more competition, does not.

4.5.1 The Political Elite

I stylize the selection of individuals who are presented with an opportunity to actively engage in the political arena by assuming that the political elite is identical with the economic elite. That is, only the producers with the most productive projects may choose to run for office.[19] While this restriction may represent formal property and educational qualifications, it does not need to be formal. The productivity of an agent's project may well be a function of how well connected they are with and within elite groups. It may arise from networks and status established by inheritance or previous economic success. The political institutions then determine whose projects are productive enough to enjoy the privilege of access to the political arena. The number n of potential candidates identifies this institution in the model. For any positive integer $n \leq p$, the agents $w_{p+1-n}, \ldots, w_p$ constitute the set N of potential candidates. Therefore, the number n is a metric of political competition in the sense of how broad the political elite is. It can be a very small number of five agents at the top of the income distribution in society or a very large number of five million. Proposition 3 obtains.

Proposition 3. *A broader political elite implies more secure property rights.*

This result derives from the insight that the equilibrium outcome depends only on the productivity of the second-least productive project among potential candidates. This productivity determines the election loser's outside option, which constrains the office holder's discretion. Allowing for a broader political elite decreases this productivity. The constraint on the office holder's discretion becomes tighter, which leads to more secure property rights. This result suggests that societies should lift restrictions on who can run for office, for example, by removing education qualifications or property requirements like land ownership.

In the environment here, upon winning the election, the office holder has to give up their productive project in its entirety (I relax this assumption in Section 5.4). That is, an agent's opportunity costs of holding office are the proceeds they could collect from their productive project were they to execute it instead. However, in general, agents' opportunity costs can be distinct from their productivity in market activities. While it might not be possible to combine holding office with working in some professions, it may be possible to combine it

[18] See, e.g., North et al. (2007) on elites and limited access to both political and economic activities.

[19] A similar approach to elites in the context of the extension of voting rights can be found in, e.g., Gradstein (2007). In the same context, the (all identical) rich form an elite in, e.g., Acemoglu and Robinson (2000, 2001).

with working in others. Having a second job or running a business while holding office may be possible to varying degrees across professions and activities. Essentially, the assumption here is that presidents have to both give up their day job and divest from any businesses. The former ensures that they can focus on the responsibilities of the office. The latter reduces the potential for an actual or perceived conflict of interest.

To the extent that project productivities may reflect educational outcomes and democracies allow easier access to activities in the political arena, at first glance, Proposition 3 seems to suggest that more democratic societies select less educated office holders. Such a prediction contradicts the findings in Besley and Reynal-Querol (2011) and Besley et al. (2011): democracies are more likely to select highly educated leaders than autocracies, and it matters for growth. However, in the model here, the productivity of a project represents the value of a candidate's outside option. It may well be more connected to an agent's elite status—connections and past economic success or inherited status—than it is related to education. Due to its static nature, the model cannot speak to implications for growth.

For the same reason, the model does not speak to endogenous change of the political institutions. Nonetheless, one may wonder whether a narrow political elite would oppose relaxing the restrictions on who can run for office. After all, its members are producers whose payoffs would increase if such restrictions were relaxed. However, with fewer restrictions on who can run for office, the election winner stands to lose the rent accruing to the comparative advantage in office. Without more structure and further information about the composition of the political elite (or a more realistic model of it) it is not clear which effect dominates. A hypothetical incumbent may thus not want to propose such a relaxation. If nobody else can propose it (e.g., in the sense of Plott 1967 and Shepsle and Weingast 1981), restrictions on who can run for office may persist.

Finally, notice that while members of the political elite face the same payoff factor as nonmember producers, they do realize the highest payoffs in society (by assumption).

4.5.2 The Qualified Electorate

The other dimension of political institutions determines the qualified electorate: who can vote over proposed regimes. The qualified electorate has to be admissible in the following sense.

Definition 3. *An admissible qualified electorate has an appropriator and a producer majority.*

The assumption that producers are the majority in every qualified electorate ensures that the election outcome is not anarchy (see Proposition 5 below). The assumption that every qualified electorate has at least one appropriator ensures that the political game has an equilibrium. Suppose that the qualified electorate only consists of producers. Any winning regime in the political game that offers producers a strictly higher payoff than the alternative invites a profitable deviation to a slightly higher tax rate. However, both candidates proposing regimes that offer the same payoff to producers, giving positive probability of winning to both, allows profitable deviations because one candidate has a better outside option than the other. Thus, with a producers-only electorate, an equilibrium of the political game does not exist. If income and wealth are imperfectly correlated, family ties matter, or being in the elite offers opportunities for appropriation, such as corruption, then an elite with respect to voting rights may well contain unproductive agents who engage in appropriation. Proposition 4 obtains.

Proposition 4. *All admissible qualified electorates result in the same equilibrium outcome.*

This result derives from two features of equilibrium in this environment. First, while the majority of voters are producers, in equilibrium, the decisive voters in every admissible electorate are appropriators. Second, changing the electorate that determines the voting outcome does not affect the payoffs associated with the proposed regimes. That is, given two regime proposals, in equilibrium, the decisive voters in all admissible qualified electorates, appropriators, prefer the same one. Hence, the voting outcomes are the same in all admissible qualified electorates. Thus, the equilibrium proposals are the same, unless the candidates differ. It follows that the equilibrium outcomes are the same, even if more people are allowed to vote, unless more people are allowed to run for office, too. Although unfit to study endogenous change of political institutions, this prediction suggests a possible explanation for a persistent lack of secure property rights during times of voting rights extension. One explanation suggested by Acemoglu and Robinson (2006, 2008) distinguishes between de facto and de jure political power. Here, the de facto power of deciding the outcome is always with the voting body—whatever its size. Focusing on voting rights might just not be enough. However, I ignore a number of potentially important economic mechanisms. For example, in the model here, a universal right to vote plays no role in preventing a majority from taking advantage of a minority, which would provide one justification for it (see Gersbach 2004).

An extension of voting rights can affect the equilibrium outcome if it changes the group that the majority of voters belong to. If the majority of voters are producers, then outcomes that look like a kleptocracy or a failed democracy are entirely possible with a narrow enough political elite. However, the political process generally delivers a regime that producers prefer to anarchy or a dictatorship, even if the office holder extracts a lot of resources. By contrast, I show in Section 4.6 that the political process delivers either anarchy or a dictatorship if the majority of voters are appropriators.

4.6 An Appropriator Majority

So far, I have focused on the case of a producer majority among voters. In this section, I study the case of an appropriator majority. The result below contrasts the self-enforcing democratization process when producers are a majority with self-enforcing dictatorship or anarchy when they are a minority.

Suppose that appropriators constitute the majority of the voting population, $p - 2 < a$. Given a regime, the payoffs of producers, appropriators, and the office holder are as described in Section 4.1. Voters' voting behavior, the candidates' problem, and the definition of equilibrium of the political game are as described in Section 4.3.1, except the probabilities of winning change as expected. The problem facing potential candidates and the definition of equilibrium of the selection game are as described in Section 4.4.1, except the payoffs of running and not running change because the equilibrium of the political game changes. Proposition 5 shows that if the whole population can vote and the majority of it are appropriators, then the political process delivers either anarchy or a dictatorship.

Proposition 5. *If $p - 2 < a$, then the equilibrium outcome is either anarchy or a dictatorship.*

Elections lead to anarchy, irrespective of how competitive they are. Enforcement is costly, and appropriators prefer less of it. In electoral competition, both candidates thus have an incentive to lower the level of enforcement they propose to zero. Competition for the office and some resources extracted from the economy via taxation drives the proposed tax rates to zero as well. In equilibrium, both candidates propose the anarchy regime, which therefore is the outcome of the election. Producers and the office holder have a payoff of zero. The regime does not depend on who the candidates are because outside options are worthless. Therefore, restrictions on who can run for office cannot affect the election outcome. Since potential candidates have a payoff of zero both in anarchy and in a dictatorship, any profile of running decisions with at least one potential candidate choosing to run is an equilibrium. Nobody running for office is not an equilibrium because deviating and being the only candidate means becoming a dictator. If only one potential candidate chooses to run for office, then a dictatorship arises. If at least two potential candidates choose to run for office, then an election delivers the anarchy regime. By the same logic, it follows that anarchy or a dictatorship prevail whenever appropriators constitute the majority of the qualified electorate.

One implication of this result is that an extension of voting rights can affect the equilibrium outcome. A society that restricts the right to vote to a small subset of the population with a majority of appropriators experiences either dictator rule or elections that lead to anarchy. An extension of voting rights that makes producers the majority among voters leads to elections that deliver regimes producers prefer to both dictatorship and anarchy. To what extent the equilibrium outcome improves depends on who can run for office. With a narrow enough political elite, outcomes that look like a kleptocracy or a failed democracy are entirely possible when the majority of voters are producers. Of course, the effect of an extension of voting rights can similarly go in the opposite direction. Thus, another implication of this result is that successful democratization requires a sufficiently large group of producers. If the majority of the population are appropriators, then democratic reforms to allow everyone to vote lead to either anarchy or a dictatorship. This implication suggests that democratic reforms should be preceded by economic reforms to ensure that the majority of the population can make a living from productive activities.

5 Discussion

In this section, I discuss some of my assumptions and the robustness of the model predictions.

5.1 Preferences and the Preference Shock

I assume that all agents are risk neutral. As the model is, curvature has no effect. Without the preference shock, the model would exhibit multiple equilibria, possibly with a multiplicity of winning regimes, in the political game given two candidates. The reason is that a set of equilibrium proposals $\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}$ has to satisfy (see the proof of Proposition 1)

$$\varphi(\theta_L, \tau_L)w_H \geq \tilde{w}(\theta_L, \tau_L) \geq \varphi(\theta_H, \tau_H)w_L, \tag{6}$$

$$g'(1-\theta_L)(1-\theta_L) = (1-\tau_L), \tag{7}$$

$$\varphi(\theta_H, \tau_H) = \varphi(\theta_L, \tau_L) \text{ and } \nu(\theta_H, \tau_H) < \nu(\theta_L, \tau_L). \tag{8}$$

Without the preference shock, every set of proposals $\{(\theta_L, \tau_L), (\theta_H, \tau_H)\}$ that satisfies (6)–(8) is an equilibrium. All of these equilibria are qualitatively identical in the sense that producers are indifferent among the proposed regimes and the same candidate, w_L, wins by proposing less enforcement than the losing candidate, w_H. However, without the preference shock, the winning regime cannot be characterized further.

The role of the preference shock then is to select a subset of equilibria so that I can further characterize the winning regime and how it depends on the parameters. Doing so does not affect the qualitative characteristics of the equilibrium or the forces at work. In particular, with the preference shock, in equilibrium, the left-most inequality in (6) holds as an equality. Thus, (6)–(7) turn into two equations in two unknowns, the unique solution to which is the winning regime (θ_L, τ_L). That is, the winning regime is unique. Despite this unique equilibrium winning regime, there are still multiple equilibria. From (8), the losing regime (θ_H, τ_H) is indeterminate in the sense that every regime that implies the same producer payoff as the winning regime while giving appropriators a lower payoff makes for an equilibrium.

To summarize and emphasize these points, suppose that $\varepsilon = 0$. That is, there is no preference shock, and only the proposed regimes matter to voters. Studying this case, Proposition 6 is almost the same as Proposition 1, without reference to a unique winning regime.

Proposition 6. *Suppose that $\varepsilon = 0$. (1) Given two candidates w_L and w_H, the political game has an equilibrium. In every equilibrium, candidate w_L wins the election with certainty, while candidate w_H proposes more enforcement: $(1-\theta_H) > (1-\theta_L)$. (2) In at least one* *equilibrium, the equilibrium regime* (θ_L, τ_L) *only depends on the loser's productivity* w_H*, and a higher* w_H *implies less enforcement, lower producer payoffs, and a higher office-holder payoff.*

Finally, from (6)–(8), it is a reasonable conjecture that the results should also hold if a different specification of the shock were to imply that the right-most inequality in (6) is binding. In this case, using (8), the equilibrium outcome of the political game depends on the winner's productivity. The in-office payoff exactly compensates the winner for the foregone payoff from production given the enacted regime. A more productive winner enacts less enforcement and collects a higher payoff in office, which compensates them for foregoing a higher-value outside option. As a more productive winner offers producers lower payoffs, all potential candidates want w_1^N to compete for and win the office. The enacted regime implies the highest possible producer payoff and an in-office payoff for w_1^N that is higher than the highest production payoff they can attain otherwise. A broader political elite implies a lower w_1^N, leading to more enforcement and more secure property rights, while the role of the qualified electorate is unaffected. More generally, binding or not, the value of the election loser's outside option constrains the winner's discretion regarding their in-office payoff in every equilibrium of the political game. Allowing for this outside option to have a lower value potentially constrains the winner more in extracting resources from society by raising high taxes and spending little on enforcement. This fact suggests that allowing more people to run for office should improve outcomes more generally in at least some weak sense.

5.2 Technology

I assume that the enforcement technology is independent of productivity. All agents are equally "productive" in office, while their productivity varies in production. However, in the model, the productivity is not associated with producers but with their projects, which are potentially transferable. If interpreted differently, an enforcement technology that is sensitive enough to office-holder productivity can overturn the unproductive candidate's comparative advantage in office. Despite that, considering a productivity-independent enforcement technology is of interest because (i) an advantage for skilled businesspersons is not obvious, even if the political dimension was related to doing business per se, and (ii) a productivity-dependent enforcement technology blurs the implications of the strategic interaction.

The results remain unchanged if the process of appropriation and distribution of resources is subject to some deadweight loss occurring due to destruction or damage. This loss could be captured by an increasing function $v : \mathbb{R}_+ \to \mathbb{R}_+$ that maps the appropriated resources into a weakly smaller but strictly positive quantity of resources available for distribution among appropriators. As long as each appropriator still receives some fixed nonzero share of the remaining resources, adding this assumption does not affect the results.

5.3 Costs of Running for Office

A sure loser who seeks to discipline the winner might not really engage in campaigning or other costly activities but simply announce that they are running and on what platform. However, what would happen if running for office were to entail a small cost? Small enough such costs have no effect. Suppose that every candidate incurs the same strictly positive fixed cost c of running. The outcome of the political game given two candidates is unaffected. Consider the selection stage. First, if nobody is running for office, then producers have a payoff of zero. Deviating to running means to become a dictator, collecting a payoff of 1, which net of costs less than 1 of running is still greater than zero. Second, if only one potential candidate is running for office, then this candidate becomes a dictator. Producers have a payoff of zero, while the dictator has a payoff of 1. For another potential candidate to deviate to running means to ensure that an election takes place, which is associated with a strictly positive payoff for producers and both candidates and thus for the deviating agent. For a small enough cost of running for office, the payoff associated with this deviation is still greater than zero.[20] Next, when running for office is costless, the two potential candidates with the two least productive projects strictly prefer to run, irrespective of what all other potential candidates choose to do. If the costs of running are small enough, then their payoff from running is still strictly greater than that from not running.[21] Finally, given that the two least productive potential candidates run for office, all other potential candidates strictly prefer not running to running. Adding a cost of running to this payoff comparison does not affect the direction of the inequality. That is, for small enough costs of running for office, the outcome of the selection game is unaffected, and so are therefore the model predictions more generally.

This conclusion rests on the political process having two stages in which entry decisions and platform choices are made sequentially. The costs of running for office can only affect the candidate selection stage as candidates are fixed after that and cannot drop out of the race. The sequential timing of the political process does not seem absurd. Arguably, candidates often seem to announce their candidacy and initiate their political campaigns on vague and general platforms or even simply on what voters perceive to be policy stances the now-candidate has held thus far. The candidates' precise platforms then crystallize only in political campaigns that do in fact react to and act on who the political opponent is and what their platform crystallizes to be. However, in the online appendix, I consider an alternative timing

[20]By Proposition 1, the smallest possible producer payoff factor that the political competition in the election stage given two candidates could deliver is $\varphi(\theta(w_n^N), \tau(w_n^N))$, which is associated with the most productive possible election loser, $w_n^N = w_p$, and determined by fundamentals. As no potential candidate can ever have a less productive project than w_1 and as both candidates have equal equilibrium payoffs, every producer who runs for office to prevent a dictatorship can expect a payoff strictly greater than $\varphi(\theta(w_p), \tau(w_p))w_1 > 0$.

[21]There are only finitely many agents so that one could in principle work out all possible payoff comparisons for all possible subsets of potential candidates, pick a strictly positive comparison-specific cost of running that preserves the inequality for each such comparison, and then pick the smallest such cost as the cost of running.

in which the entry decisions and the platforms on which candidates run have to be determined and announced simultaneously. An equilibrium then requires that given the candidates and their platforms, candidates cannot profitably deviate to either not running or proposing a different regime, and potential candidates who are not running cannot profitably deviate to running on some platform. I show that with this alternative timing, if running is costless and producers are a large enough majority among the voters, then the results from Sections 4.3–4.5 hold for two-candidate equilibria.

However, with this alternative timing, any positive fixed costs of running for office render two-candidate equilibria nonexistent. For any two candidates, one of them has a more productive project than the other and thus a more valuable outside option associated with higher payoffs. It can thus not be the case that at the same time, both candidates are indifferent between the same in-office payoff and their respective payoffs from not holding office. Therefore, in every two-candidate equilibrium, one candidate has to lose the election with certainty. Since running is costly, that candidate can profitably deviate to not running. That is, two-candidate equilibria do not exist. For small enough costs of running, there is also no equilibrium with fewer than two candidates because potential candidates strictly prefer running for office over enduring anarchy or a dictatorship. The underlying reason is that agents' preferred regime depends on their role in society. The same potential candidate who prefers low taxes and high enforcement expenditures when a private citizen prefers high taxes and low enforcement expenditures when in office. The single candidate in a potential one-candidate equilibrium thus proposes the dictator regime, which is associated with a payoff of zero for all other agents. It is profitable for a second potential candidate to deviate to running for office to prevent the dictator outcome. The described implications distinguish my environment from others in the literature (e.g., Osborne and Slivinski 1996; Brusco and Roy 2011).

5.4 Office Holders Hold Office Full-Time

I maintain the assumption that societies' top executives hold office full-time and cannot execute their project. In many cases where the precedent is that presidents divest from businesses to reduce the potential for an actual or perceived conflict of interest, this assumption seems to be a reasonable simplification. With regards to more oligarchic and even kleptocratic states that hold elections, any business the top executives might operate may well benefit from or outright build on the executives' very position at the top of the state. The endogenous rents from holding office in the model capture some of these aspects. However, in this section, I alter the model to relax the assumption that the office is held full-time. I show that Proposition 1 is unaffected. In particular, if the election loser's project, i.e., their outside option, is more productive, then the winning regime in the equilibrium of the political game provides less secure property rights, a higher payoff for the office holder, and lower payoffs for producers.

Suppose that office holders can execute a fraction $(1-\gamma) \in (0,1)$ of their project, while the idle individual takes over and executes the remaining fraction $\gamma \in (0,1)$ of it. The project proceeds accruing to the office holder are subject to both taxation and appropriation. Then, the office holder's payoff is given by the function $\breve{\tilde{w}} : [0,1]^2 \times (0,1) \to \mathbb{R}$, defined as

$$\breve{\tilde{w}}(\theta, \tau; w) = \tilde{w}(\theta, \tau) + \varphi(\theta, \tau)(1-\gamma)w = \tau - g(1-\theta) + (1-\theta)(1-\tau)(1-\gamma)w,$$

which is strictly increasing in τ for all $\tau \in (0,1)$ as $1 > (1-\theta)(1-\gamma)w$. Assume that $\breve{\tilde{w}}(\theta, \tau; w)$ is quasiconcave in (θ, τ) for all $w \in (0,1)$. All other payoffs remain unchanged. For this altered environment with the above assumptions, the following result obtains.

Proposition 7. *Under the above assumptions, Proposition 1 holds unchanged.*

That is, Proposition 1 is unaffected. Both in autarky and with a dictator—who simply chooses (θ, τ) to maximize $\breve{\tilde{w}}(\theta, \tau; w)$, giving the regime $(1,1)$—the producer payoff factor equals zero. Therefore, all other results in Sections 4.4–4.5 remain unaffected as well. Due to the unchanged effects of variations in w_H on the outcome of the political game, the mechanics of the rest of the analysis remain unchanged. The related proofs only require minor adjustments to the payoff expressions for the office holder in the selection game. The reason for this result is the fact that as before, all else equal, agents with more productive projects face higher opportunity costs of holding office as long as they have to give up at least some fraction of their project to do so. The simplifying assumption that office holders hold office full-time and have to forgo their project altogether is not driving the results.

A sufficient condition for the above assumptions to be satisfied that involves only the cost function g is that $2g'(1-\theta) + g''(1-\theta)\theta \geq 2$ for all $(1-\theta) \in (0,1)$. An example of such a cost function is $g(1-\theta) = (1-\theta)^2$. Of course, the restrictions on g can be less restrictive, if one is willing to also restrict other fundamentals, such as γ and $\mathcal{W}$.

6 Concluding Remarks

I study a model that offers an explanation for differences in the security of property rights across countries that hold elections. It traces those differences back to political institutions that determine how competitive these elections are. One implication is that two societies that initially appear to be very similar in many supposedly relevant dimensions, like economic fundamentals and observable characteristics of office holders, may enact very different levels of property rights enforcement. Another implication is that lifting restrictions on who can run for office may benefit society more than lifting restrictions on who can vote. A further implication is that democratic reforms to extend voting rights may need to be preceded by economic reforms to prevent adverse outcomes.

This paper suggests that it can benefit society to allow as many people as possible to run for office, particularly those with unproductive outside options. However, I ignore policy-making ability to focus on the role of outside options in a rent-seeking context. It is conceivable that allowing everyone in society to run for office does not necessarily improve outcomes when ability in office matters. In this case, to what extent outcomes improve might depend on the specifics of the context, the underlying environment, the political process and institutions, and the relation between policy-making ability and outside options. I leave these issues for future work.

In the underlying economy, agents have fixed occupations and thus belong to fixed groups of producers and appropriators. This environment can be thought of as a reduced-form version of one in which agents have the choice to take up an occupation in production or appropriation, similar to Murphy et al. (1993) and Acemoglu (1995). Future work could endogenize this occupational choice to study its interaction with the security of property rights in a dynamic environment. Strong property rights enforcement might progressively induce agents to become entrepreneurs, leading to the political process delivering progressively stronger property rights enforcement. Similarly, weak property rights enforcement might induce agents to become appropriators, leading to progressively weaker property rights enforcement. It would be interesting to compare the implications to the analysis of Cao and Lagunoff (2020).

I have assumed for simplicity that individual production and thus aggregate output is fixed. This assumption is not essential for the main results because the economic mechanism works through agents' outside options, not the size of the pie. I provide an extension in the online appendix that allows for output to depend on the security of property rights to demonstrate this point. However, the model is also silent on the nature of the productive projects, which determine agents' outside options. Future work could more fully endogenize economic activity and potentially the availability of productive projects. It could also introduce a trade-off facing office holders between diverting resources today and inducing investments into a larger pie to divert resources from tomorrow. It could embed a similar political process into a dynamic model with a role for the expected future security of property rights in determining productive investment. Such a setting could be used to study the role of the competitiveness of elections in determining different paths of economic development. It could also be used to study in more detail what conditions, such as what distributions of productive opportunities, allow for effective democratization.

Arguably, the political process is simple and natural. In the context of the paper, the policy preferences of voters from different groups seem self-evident, and it should be possible to identify which group constitutes a majority among voters. However, the equilibrium selection using the preference shock is somewhat unusual. Future work could more fully analyze what limitations might arise from both the specification of the political process and the use of the preference shock for equilibrium selection. It could assess under what conditions the results hold for other specifications of the shock or whether it could be discarded altogether if further equilibrium refinements are considered. More generally, it could assess under what conditions the results carry over to alternative specifications of the political process.

Appendix: Proofs

Proposition 1

Proof. The proof proceeds in steps. Each step makes a statement and then proves it. In these steps, I describe what an equilibrium has to look like, find all candidate equilibria (all of which have the same unique winning regime), and show that they in fact are equilibria.

1. *In equilibrium, the proposed regimes (θ_k, τ_k) and (θ_{-k}, τ_{-k}) satisfy $\varphi(\theta_k, \tau_k) = \varphi(\theta_{-k}, \tau_{-k}) > 0$.* Suppose for a contradiction that $\varphi(\theta_k, \tau_k) \neq \varphi(\theta_{-k}, \tau_{-k})$. Without loss of generality, assume that $\varphi(\theta_k, \tau_k) > \varphi(\theta_{-k}, \tau_{-k})$, implying that w_k wins the election with certainty. Note that $\varphi(\theta_k, \tau_k) > \varphi(\theta_{-k}, \tau_{-k}) \geq 0$ implies that $(1-\theta_k) > 0$ and $(1-\tau_k) > 0$. Then, by continuity, w_k can profitably deviate to proposing $(\theta'_k, \tau'_k) = (\theta_k, \tau_k + \epsilon)$ for a small enough $\epsilon > 0$ so that $\varphi(\theta'_k, \tau'_k) = \varphi(\theta_k, \tau_k + \epsilon) > \varphi(\theta_{-k}, \tau_{-k})$ to still win the election with certainty and secure a higher payoff since $\tilde{w}(\cdot, \cdot)$ is strictly increasing in τ, a contradiction. Thus, $\varphi(\theta_k, \tau_k) = \varphi(\theta_{-k}, \tau_{-k})$. Now, suppose for a contradiction that $\varphi(\theta_k, \tau_k) = \varphi(\theta_{-k}, \tau_{-k}) = 0$. At least one of the candidates—without loss of generality, assume w_k—has a positive probability of losing the election, say $(1-\alpha) \in (0, 1]$, and thus getting a payoff of 0. That is, w_k's expected payoff is $\alpha\tilde{w}(\theta_k, \tau_k) + (1-\alpha)\varphi(\theta_{-k}, \tau_{-k})w_k = \alpha\tilde{w}(\theta_k, \tau_k) \leq \alpha\tilde{w}(1, 1) = \alpha < 1$, where $\tilde{w}(1, 1) = 1$ is the maximum possible in-office payoff. By continuity, w_k can profitably deviate to proposing $(\theta'_k, \tau'_k) = (1-\epsilon, 1-\epsilon)$ for a small enough $\epsilon > 0$ so that $\tilde{w}(\theta'_k, \tau'_k) = \tilde{w}(1-\epsilon, 1-\epsilon) > \alpha$ to win the election with certainty, as $\varphi(\theta'_k, \tau'_k) > 0 = \varphi(\theta_{-k}, \tau_{-k})$, and secure a higher expected payoff $\tilde{w}(\theta'_k, \tau'_k)$, a contradiction.

2. *In equilibrium, if w_k proposes (θ_k, τ_k) and wins the election with positive probability against w_{-k}, who proposes (θ_{-k}, τ_{-k}), then $\tilde{w}(\theta_k, \tau_k) \geq \varphi(\theta_{-k}, \tau_{-k})w_k$.* Suppose for a contradiction that $\varphi(\theta_{-k}, \tau_{-k})w_k > \tilde{w}(\theta_k, \tau_k)$. From Step **1** follows that $\varphi(\theta_{-k}, \tau_{-k}) > 0$. Then, w_k's expected payoff is $\alpha\tilde{w}(\theta_k, \tau_k) + (1-\alpha)\varphi(\theta_{-k}, \tau_{-k})w_k < \varphi(\theta_{-k}, \tau_{-k})w_k$ for some $\alpha \in (0, 1]$. They can profitably deviate to proposing $(\theta'_k, \tau'_k) = (\theta_k, 1)$ to lose the election with certainty, as $\varphi(\theta_{-k}, \tau_{-k}) > 0 = \varphi(\theta'_k, \tau'_k)$, and secure a higher payoff $\varphi(\theta_{-k}, \tau_{-k})w_k$, a contradiction.

3. *In equilibrium, if w_k proposes (θ_k, τ_k) and wins the election with positive probability against w_{-k}, who proposes (θ_{-k}, τ_{-k}), then $\tilde{w}(\theta_k, \tau_k) \geq \tilde{w}(\theta_{-k}, \tau_{-k})$.* Suppose for a contradiction that $\tilde{w}(\theta_{-k}, \tau_{-k}) > \tilde{w}(\theta_k, \tau_k)$. Then, $\tilde{w}(\theta_{-k}, \tau_{-k}) > \tilde{w}(\theta_k, \tau_k) \geq \varphi(\theta_{-k}, \tau_{-k})w_k > 0$, where the last two inequalities follow from Steps **2** and **1**, respectively. It follows that $(\theta_{-k}, \tau_{-k}) \in (0, 1)^2$. Then, w_k's expected payoff is $\alpha\tilde{w}(\theta_k, \tau_k) + (1-\alpha)\varphi(\theta_{-k}, \tau_{-k})w_k \leq \tilde{w}(\theta_k, \tau_k) < \tilde{w}(\theta_{-k}, \tau_{-k})$ for some $\alpha \in (0, 1]$. By continuity, w_k can profitably deviate to proposing $(\theta'_k, \tau'_k) = (\theta_{-k}, \tau_{-k} - \epsilon)$ for a small enough $\epsilon > 0$ so that $\tilde{w}(\theta'_k, \tau'_k) = \tilde{w}(\theta_{-k}, \tau_{-k} - \epsilon) > \tilde{w}(\theta_k, \tau_k)$ to win the election with certainty, as $\varphi(\theta'_k, \tau'_k) = \varphi(\theta_{-k}, \tau_{-k} - \epsilon) > \varphi(\theta_{-k}, \tau_{-k})$, and secure a higher expected payoff $\tilde{w}(\theta'_k, \tau'_k)$, a contradiction.

4. *In equilibrium, if w_k proposes (θ_k, τ_k) and wins the election with positive probability against w_{-k}, who proposes (θ_{-k}, τ_{-k}), then $\varphi(\theta_k, \tau_k)w_{-k} \geq \tilde{w}(\theta_k, \tau_k)$.* Suppose for a contradiction that $\tilde{w}(\theta_k, \tau_k) > \varphi(\theta_k, \tau_k)w_{-k} > 0$, where the second inequality follows from Step **1**. It follows that $(\theta_k, \tau_k) \in (0, 1)^2$. From Step **3** follows that $\tilde{w}(\theta_k, \tau_k) \geq \tilde{w}(\theta_{-k}, \tau_{-k})$. Then, for some $\alpha \in [0, 1)$, w_{-k}'s expected payoff is $\alpha\tilde{w}(\theta_{-k}, \tau_{-k}) + (1 - \alpha)\varphi(\theta_k, \tau_k)w_{-k} \leq \alpha\tilde{w}(\theta_k, \tau_k) + (1 - \alpha)\varphi(\theta_k, \tau_k)w_{-k} < \tilde{w}(\theta_k, \tau_k)$. By continuity, w_{-k} can profitably deviate to proposing $(\theta'_{-k}, \tau'_{-k}) = (\theta_k, \tau_k - \epsilon)$ for a small enough $\epsilon > 0$ so that $\tilde{w}(\theta'_{-k}, \tau'_{-k}) = \tilde{w}(\theta_k, \tau_k - \epsilon) > \alpha\tilde{w}(\theta_{-k}, \tau_{-k}) + (1 - \alpha)\varphi(\theta_k, \tau_k)w_{-k}$ to win the election with certainty, as $\varphi(\theta'_{-k}, \tau'_{-k}) = \varphi(\theta_k, \tau_k - \epsilon) > \varphi(\theta_k, \tau_k)$, and secure a higher expected payoff $\tilde{w}(\theta'_{-k}, \tau'_{-k})$, a contradiction.

5. *In equilibrium, w_L wins the election with certainty.* Suppose for a contradiction that w_H wins the election with positive probability. Then, since $\varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H) > 0$ from Step **1**, it must hold from Steps **2** and **4** that $\tilde{w}(\theta_H, \tau_H) \geq \varphi(\theta_L, \tau_L)w_H = \varphi(\theta_H, \tau_H)w_H > \varphi(\theta_H, \tau_H)w_L \geq \tilde{w}(\theta_H, \tau_H)$, a contradiction.

6. *In equilibrium, $(\theta_L, \tau_L) \neq (\theta_H, \tau_H)$.* Suppose for a contradiction that $(\theta_L, \tau_L) = (\theta_H, \tau_H) = (\theta, \tau)$. With probability $(1 - \varepsilon) > 0$ only the proposed regimes matter to voters, who then are indifferent. Thus, w_H wins the election with positive probability, a contradiction.

7. *In equilibrium, $\nu(\theta_L, \tau_L) > \nu(\theta_H, \tau_H)$ and $(1 - \theta_L) < (1 - \theta_H)$.* Suppose for a contradiction that $\nu(\theta_L, \tau_L) \leq \nu(\theta_H, \tau_H)$. With probability $(1 - \varepsilon) > 0$ only the proposed regimes matter to voters. As $\varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H)$ and appropriators either prefer (θ_H, τ_H) or are indifferent as well, w_H wins the election with positive probability, a contradiction. Therefore,

$$\nu(\theta_L, \tau_L) > \nu(\theta_H, \tau_H). \tag{9}$$

That is, $\theta_L(1 - \tau_L) > \theta_H(1 - \tau_H)$, which with $\varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H)$ implies that $(1 - \tau_L) > (1 - \tau_H)$ because $(1 - \theta_L)(1 - \tau_L) = (1 - \theta_H)(1 - \tau_H)$ can be written as

$$\begin{aligned} & (1 - \tau_L) - \theta_L(1 - \tau_L) = (1 - \tau_H) - \theta_H(1 - \tau_H) \\ \Rightarrow \quad & (1 - \tau_L) - (1 - \tau_H) = \theta_L(1 - \tau_L) - \theta_H(1 - \tau_H) > 0. \end{aligned}$$

Thus, again with $\varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H)$, it follows that $(1 - \theta_L) < (1 - \theta_H)$ or $\theta_H < \theta_L$.

8. *In equilibrium, the regime (θ_L, τ_L) that w_L proposes solves*

$$\max_{(\theta,\tau)\in[0,1]^2} \tilde{w}(\theta, \tau) \quad s.t. \quad \varphi(\theta, \tau) \geq \bar{\varphi} = \varphi(\theta_H, \tau_H). \tag{P}$$

Suppose for a contradiction that (θ_L, τ_L) does not solve Problem (P). By Step **5**, w_L wins the election with certainty and has expected payoff $\tilde{w}(\theta_L, \tau_L)$. If (θ_L, τ_L) violates the constraint so that $\varphi(\theta_L, \tau_L) < \varphi(\theta_H, \tau_H)$, then w_H wins the election with certainty, a contradiction. If there is a $(\theta', \tau') \in [0, 1]^2$ such that $\varphi(\theta', \tau') \geq \bar{\varphi}$ and $\tilde{w}(\theta', \tau') > \tilde{w}(\theta_L, \tau_L)$, then $\tau' > 0$ because $\tilde{w}(\theta', \tau') > \tilde{w}(\theta_L, \tau_L) \geq \varphi(\theta_H, \tau_H) w_L > 0$ by Steps **2** and **1**. By continuity, w_L can profitably deviate to proposing $(\theta', \tau' - \epsilon)$ for a small enough $\epsilon > 0$ so that $\tilde{w}(\theta', \tau' - \epsilon) > \tilde{w}(\theta_L, \tau_L)$ and $\varphi(\theta', \tau' - \epsilon) > \varphi(\theta', \tau') \geq \bar{\varphi} = \varphi(\theta_H, \tau_H)$ to win the election with certainty and secure a higher expected payoff $\tilde{w}(\theta', \tau' - \epsilon)$, a contradiction. Thus, (θ_L, τ_L) solves Problem (P) so that (θ_L, τ_L) and (θ_H, τ_H) satisfy (the constraint and Steps **2** and **1** imply that $(\theta_L, \tau_L) \in (0, 1)^2$)

$$g'(1 - \theta_L)(1 - \theta_L) = (1 - \tau_L), \tag{10}$$

$$\varphi(\theta_H, \tau_H) = \varphi(\theta_L, \tau_L). \tag{11}$$

9. *In equilibrium, $\varphi(\theta_L, \tau_L) w_H = \tilde{w}(\theta_L, \tau_L)$ and the preference shock gives neither candidate an advantage and thus has no effect.* As w_L wins the election with certainty by Step **5**, from Steps **4** and **2**, $\varphi(\theta_L, \tau_L) w_H \geq \tilde{w}(\theta_L, \tau_L) \geq \varphi(\theta_H, \tau_H) w_L$. Suppose for a contradiction that $\varphi(\theta_L, \tau_L) w_H > \tilde{w}(\theta_L, \tau_L)$. Given (θ_L, τ_L), any regime (θ', τ') that makes producers at least as well off as (θ_L, τ_L) satisfies $\varphi(\theta', \tau') \geq \varphi(\theta_L, \tau_L)$. As $\varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H)$ by Step **1**, (θ', τ') is in the constraint set of Problem (P). As (θ_L, τ_L) solves Problem (P), the highest in-office payoff that (θ', τ') can offer w_H is $\tilde{w}(\theta_L, \tau_L)$, which is strictly less than w_H's payoff from losing the election and being a private citizen, $\varphi(\theta_L, \tau_L) w_H$. That is, w_H is running for office even though they are worse off being in office with any regime that makes producers at least as well off as their opponent's proposal than losing and being a private citizen: w_H is public-spirited. The same is not true for w_L because $\tilde{w}(\theta_L, \tau_L) \geq \varphi(\theta_H, \tau_H) w_L$. Since producers are indifferent between the proposed regimes, $\varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H)$, due to the preference shock, with probability $\varepsilon > 0$, producers and thus the majority of voters vote for w_H. That is, w_H wins the election with positive probability, a contradiction. Therefore,

$$\varphi(\theta_L, \tau_L) w_H = \tilde{w}(\theta_L, \tau_L) = \tau_L - g(1 - \theta_L). \tag{12}$$

Since $\tilde{w}(\theta_L, \tau_L) \geq \varphi(\theta_H, \tau_H) w_L$ while producers are indifferent and w_H could propose (θ_L, τ_L) to make producers indifferent while having an in-office payoff $\tilde{w}(\theta_L, \tau_L) = \varphi(\theta_L, \tau_L) w_H$ by (12), the preference shock gives neither candidate an advantage and thus has no effect.

10. *In equilibrium, (θ_L, τ_L) is unique and only depends on w_H. A higher w_H implies less enforcement, lower producer payoffs, and a higher office-holder payoff.* Collecting (9)–(12):

$$\varphi(\theta_L, \tau_L) w_H = \tau_L - g(1 - \theta_L), \tag{13}$$

$$g'(1 - \theta_L)(1 - \theta_L) = (1 - \tau_L), \tag{14}$$

$$(15) \qquad \varphi(\theta_H, \tau_H) = \varphi(\theta_L, \tau_L) \text{ and } \nu(\theta_H, \tau_H) < \nu(\theta_L, \tau_L).$$

Now, (13) and (14) are two equations in two unknowns that can be solved for (θ_L, τ_L). The solution only depends on w_H and has to be interior. Then, any regime (θ_H, τ_H) that satisfies (15) completes a candidate equilibrium. Consider Equations (13) and (14). From (14),

$$(16) \qquad (1-\tau_L) = g'(1-\theta_L)(1-\theta_L) \quad \text{and thus} \quad \tau_L = 1 - g'(1-\theta_L)(1-\theta_L).$$

Plugging these into (13) using $\varphi(\theta_L, \tau_L) = (1-\theta_L)(1-\tau_L)$ and rewriting gives

$$g'(1-\theta_L)(1-\theta_L)\left((1-\theta_L)w_H + 1\right) = 1 - g(1-\theta_L).$$

Let $h : (0,1) \times (0,1) \to \mathbb{R}$ be given by

$$h((1-\theta); w_H) = g'(1-\theta)(1-\theta)\left((1-\theta)w_H + 1\right) + g(1-\theta) - 1.$$

This function h is strictly increasing in both its arguments and, fixing w_H, approaches negative and positive values when $(1-\theta)$ approaches zero and one, respectively. Thus, for any $w_H \in (0,1)$, there exists a unique $(1-\theta_L) \in (0,1)$ such that $h((1-\theta_L); w_H) = 0$, and that $(1-\theta_L)$ is strictly smaller the higher w_H is. The unique $(1-\theta_L)$ implies a unique $(1-\tau_L)$ via (16). Clearly, $(1-\tau_L) > 0$. From $h((1-\theta_L); w_H) = 0$ follows that $(1-\tau_L) < 1$ as well because the sum of $g'(1-\theta_L)(1-\theta_L)$, multiplied by a factor greater than 1, and a positive quantity $g(1-\theta_L)$ equals 1. Thus, $(1-\tau_L) \in (0,1)$. Moreover, again from (16), this $(1-\tau_L)$ is strictly increasing in $(1-\theta_L)$. So, a higher w_H strictly decreases both $(1-\theta_L)$ and $(1-\tau_L)$ and thus $\varphi(\theta_L, \tau_L)$, while it strictly increases $\tilde{w}(\theta_L, \tau_L) = \tau_L - g(1-\theta_L)$. Given (θ_L, τ_L), to complete the set of proposals, pick any τ_H such that $(1-\theta_L)(1-\tau_L) < (1-\tau_H) < (1-\tau_L)$. Let $\theta_H = 1 - (1-\theta_L)(1-\tau_L)/(1-\tau_H)$ so that $(1-\theta_H)(1-\tau_H) = (1-\theta_L)(1-\tau_L)$ as in (15). From $(1-\tau_H) < (1-\tau_L)$ follows that $(1-\theta_H) > (1-\theta_L)$ and $\theta_H < \theta_L$, which implies that $\theta_H(1-\tau_H) < \theta_L(1-\tau_L)$ as in (15). That is, (θ_H, τ_H) satisfies (15).

11. *Neither candidate can profitably deviate.* Given (θ_H, τ_H), w_L cannot increase their expected payoff $\tilde{w}(\theta_L, \tau_L) = \varphi(\theta_L, \tau_L)w_H = \varphi(\theta_H, \tau_H)w_H > \varphi(\theta_H, \tau_H)w_L$ by deviating. No other regime that w_L can propose to win the election with positive probability—a necessary condition for which is for it to be in the constraint set of Problem (P)—gives a higher in-office payoff than (θ_L, τ_L) as (θ_L, τ_L) solves Problem (P). Deviating to proposing a regime with which w_L loses the election with certainty, w_L would earn a strictly lower payoff. Similarly, given (θ_L, τ_L), w_H cannot increase their expected payoff $\varphi(\theta_L, \tau_L)w_H$ by deviating. Any deviation to a regime with which w_H still loses the election with certainty does not affect payoffs. From Problem (P), the highest in-office payoff from a regime (θ', τ') that w_H can propose to win with positive probability, which requires that $\varphi(\theta', \tau') \geq \varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H)$, is

$\tilde{w}(\theta_L, \tau_L) = \varphi(\theta_L, \tau_L) w_H$. Thus, the set of proposals described is an equilibrium. ■

Proposition 2

Proof. I first develop explicit expressions for some notation used in payoffs (4) and (5). Fixing $w_j^N \in N$, for all $w' \in N_j'$, define $x(w', N_j') = |\{w \in N_j' : w < w'\}|$ to be the number of agents w in N_j' who w' would lose the election against if the pair $\{w, w'\}$ were selected to run for office. Then, $x(w', N_j')$ is the number of pairs $\{w, w'\} \subseteq N_j'$ with $(\theta(w'), \tau(w'))$ as the equilibrium outcome of the political game. Letting $n' = |N'|$ be the number of all potential candidates who choose to run, the probability of any particular pair of them to be selected to compete for office is given by $\pi(n') = 2/[n'(n'-1)]$. As $n' = n_j' + \chi_j$ for all w_j^N, for the case $\chi_j = 0$,

$$\pi(n_j') x(w', N_j') = \frac{2x(w', N_j')}{n_j'(n_j'-1)}. \tag{17}$$

Similarly, for the case $\chi_j = 1$,

$$\pi(n_j'+1) = \frac{2}{n_j'(n_j'+1)} \quad \text{and} \quad \pi(n_j'+1) x(w', N_j') = \frac{2x(w', N_j')}{n_j'(n_j'+1)}. \tag{18}$$

The expressions (17) and (18) can now be plugged into the payoffs (4) and (5), respectively.[22]

I find the unique pure strategy equilibrium by iterated elimination of strictly dominated strategies. Consider any agent $w_j^N \in N$ and any strategy profile N_j' such that $n_j' \leq 1$. Not running implies either anarchy or some other agent's dictatorship, and each yields a payoff of zero. Running yields a strictly positive payoff either as a dictator or via the election. Thus, for any N_j', $n_j' \leq 1$, w_j^N strictly prefers running over not running. Hence, $N' = N$ if $|N| \leq 2$.

Suppose that $|N| > 2$. Suppose that $n_j' > 1$. By Equation (3), candidate w_j^N's payoff from winning against a candidate $w' > w_j^N$ is $\tilde{w}(\theta(w'), \tau(w')) = \varphi(\theta(w'), \tau(w'))w' > \varphi(\theta(w'), \tau(w'))w_j^N$. First, consider w_1^N and any strategy profile N_1' such that $n_1' > 1$. Note that $\sum_{w' \in N_1'} \frac{2x(w', N_1')}{n_1'(n_1'-1)} = 1$ (see Footnote 22) and $\sum_{w' \in N_1'} \frac{1}{n_1'} = 1$. As $w' > w_1^N$ for all $w' \in N_1'$, it follows that $\varphi(\theta(w'), \tau(w'))w' > \varphi(\theta(w'), \tau(w'))w_1^N$ for all $w' \in N_1'$. Thus, w_1^N's expected payoff from running is, adapting (5) for w_1^N and $n_1' > 1$ and using (18),

$$\sum_{w' \in N_1'} \frac{2x(w', N_1')}{n_1'(n_1'+1)} \varphi(\theta(w'), \tau(w')) w_1^N + \sum_{w' \in N_1'} \frac{2}{n_1'(n_1'+1)} \varphi(\theta(w'), \tau(w')) w'$$

[22] In the relevant case in (4), $n_j' \geq 2$ while $x(w', N_j')$ cannot exceed $n_j' - 1$ so that $\pi(n_j')x(w', N_j') \leq 1$. As $\sum_{w' \in N_j'} x(w', N_j') = 0 + \ldots + (n_j' - 1)$, $\sum_{w' \in N_j'} \pi(n_j') x(w', N_j') = \frac{2}{n_j'(n_j'-1)} \sum_{w' \in N_j'} x(w', N_j') = 1$. In the relevant case in (5), $n_j' \geq 1$ while $x(w', N_j')$ cannot exceed $n_j' - 1$ so that $\pi(n_j'+1)x(w', N_j') \leq 1$. As $\sum_{w' \in N_j'} (x(w', N_j') + 1) = 1 + \ldots + n_j'$, $\sum_{w' \in N_j'} \pi(n_j'+1)x(w', N_j') + \sum_{w' \in N_j'} \pi(n_j'+1) = \sum_{w' \in N_j'} \frac{2x(w', N_j')}{n_j'(n_j'+1)} + \sum_{w' \in N_j'} \frac{2}{n_j'(n_j'+1)} = \frac{2}{n_j'(n_j'+1)} \sum_{w' \in N_j'} (x(w', N_j') + 1) = 1$.

$$= \frac{n_1' - 1}{n_1' + 1} \sum_{w' \in N_1'} \frac{2x(w', N_1')}{n_1'(n_1' - 1)} \varphi(\theta(w'), \tau(w')) w_1^N + \left(1 - \frac{n_1' - 1}{n_1' + 1}\right) \sum_{w' \in N_1'} \frac{1}{n_1'} \varphi(\theta(w'), \tau(w')) w'$$
$$> \sum_{w' \in N_1'} \frac{2x(w', N_1')}{n_1'(n_1' - 1)} \varphi(\theta(w'), \tau(w')) w_1^N,$$

which is w_1^N's expected payoff from not running, when adapting (4) for w_1^N and $n_1' > 1$ and using (17). The strict inequality derives from the convex combination of two weighted averages of payoffs implied by the same regimes for two reasons. First, the first weighted average puts more weight on low-payoff regimes than on high-payoff ones: Given a set of potential candidates that want to run, agents with very productive projects would lose against many others and thus oftentimes determine the outcome when drawn as one of the candidates. Similarly, agents with very unproductive projects would win against many others and thus not as often determine the outcome when drawn as one of the candidates. It follows that low-producer-payoff regimes, due to more productive losers (see Proposition 1), are more likely—as they are the outcome of a larger number of pairs selected to run for office—than high-producer-payoff regimes, due to less productive losers—as they are the outcome of a smaller number of pairs selected to run for office. At the same time, the second weighted average weighs all regime payoffs equally. Second, for each regime, the payoff for w_1^N is higher in the second weighted average. Thus, for any N_1', $n_1' > 1$, w_1^N strictly prefers running over not running. Combining this conclusion with the case when $n_1' \leq 1$, running strictly dominates not running for w_1^N. Thus, w_1^N runs.

Next, consider agent w_2^N and any strategy profile N_2' such that $n_2' > 1$ and $w_1^N \in N_2'$. Note that $\sum_{w' \in N_2'} \frac{2x(w', N_2')}{n_2'(n_2'-1)} = 1$ (see Footnote 22) and $\sum_{w' \in N_2'} \frac{1}{n_2'} = 1$. Since $x(w_1^N, N_2') = 0$, $w' > w_2^N$ for all $w' \in N_2' \setminus \{w_1^N\}$, $\varphi(\theta(w'), \tau(w'))w' > \varphi(\theta(w'), \tau(w'))w_2^N$ for all $w' \in N_2' \setminus \{w_1^N\}$ and, by Proposition 1, $\varphi(\theta(w_2^N), \tau(w_2^N))w_2^N > \varphi(\theta(w'), \tau(w'))w_2^N$ for all $w' \in N_2' \setminus \{w_1^N\}$, w_2^N's expected payoff from running is, adapting (5) for w_2^N and $n_2' > 1$ and using (18),

$$\sum_{w' \in N_2'} \frac{2x(w', N_2')}{n_2'(n_2' + 1)} \varphi(\theta(w'), \tau(w')) w_2^N + \sum_{w' \in N_2' \setminus \{w_1^N\}} \frac{2}{n_2'(n_2' + 1)} \varphi(\theta(w'), \tau(w')) w'$$
$$+ \frac{2}{n_2'(n_2' + 1)} \varphi(\theta(w_2^N), \tau(w_2^N)) w_2^N$$
$$= \frac{n_2' - 1}{n_2' + 1} \sum_{w' \in N_2'} \frac{2x(w', N_2')}{n_2'(n_2' - 1)} \varphi(\theta(w'), \tau(w')) w_2^N$$
$$+ \left(1 - \frac{n_2' - 1}{n_2' + 1}\right) \left(\sum_{w' \in N_2' \setminus \{w_1^N\}} \frac{1}{n_2'} \varphi(\theta(w'), \tau(w')) w' + \frac{1}{n_2'} \varphi(\theta(w_2^N), \tau(w_2^N)) w_2^N \right)$$
$$> \sum_{w' \in N_2'} \frac{2x(w', N_2')}{n_2'(n_2' - 1)} \varphi(\theta(w'), \tau(w')) w_2^N,$$

which is w_2^N's expected payoff from not running, when adapting (4) for w_2^N and $n_2' > 1$ and using (17). The strict inequality derives from the convex combination of two weighted averages of payoffs for three reasons. First, by the same reasoning as above, the first weighted average puts more weight on low-payoff regimes than on high-payoff ones, while the second weighted average weighs all regime payoffs equally. Second, the second average includes all regimes that have positive weight in the first average, but the payoff associated with each of these regimes is higher in the second average. Third, the second average includes an additional regime with an associated payoff that is greater than the payoffs associated with all regimes that have positive weight in the first average. Thus, for any N_2', $n_2' > 1$, $w_1^N \in N_2'$, w_2^N strictly prefers running over not running. Combining this conclusion with the case when $n_2' \leq 1$, given that w_1^N runs, running strictly dominates not running for w_2^N. Thus, w_2^N runs.

Next, consider agent w_n^N and any strategy profile N_n' such that $n_n' > 1$ and $w_1^N, w_2^N \in N_n'$. Note that $\sum_{w' \in N_n'} \frac{2x(w', N_n')}{n_n'(n_n'-1)} = 1$ (see Footnote 22), $w_n^N > w'$ for all $w' \in N_n'$, and, by Proposition 1, $\varphi(\theta(w_n^N), \tau(w_n^N))w_n^N < \varphi(\theta(w'), \tau(w'))w_n^N$ for all $w' \in N_n'$ so that w_n^N's expected payoff from running is, adapting (5) for w_n^N and $n_n' \geq 2$ and using (18),

$$
\begin{aligned}
&\sum_{w' \in N_n'} \frac{2x(w', N_n')}{n_n'(n_n'+1)} \varphi(\theta(w'), \tau(w'))w_n^N + \sum_{w' \in N_n'} \frac{2}{n_n'(n_n'+1)} \varphi(\theta(w_n^N), \tau(w_n^N))w_n^N \\
&= \sum_{w' \in N_n'} \frac{2x(w', N_n')}{n_n'(n_n'+1)} \varphi(\theta(w'), \tau(w'))w_n^N + n_n' \frac{2}{n_n'(n_n'+1)} \varphi(\theta(w_n^N), \tau(w_n^N))w_n^N \\
&= \frac{n_n'-1}{n_n'+1} \sum_{w' \in N_n'} \frac{2x(w', N_n')}{n_n'(n_n'-1)} \varphi(\theta(w'), \tau(w'))w_n^N + \left(1 - \frac{n_n'-1}{n_n'+1}\right) \varphi(\theta(w_n^N), \tau(w_n^N))w_n^N \\
&< \sum_{w' \in N_n'} \frac{2x(w', N_n')}{n_n'(n_n'-1)} \varphi(\theta(w'), \tau(w'))w_n^N,
\end{aligned}
$$

which is w_n^N's expected payoff from not running, when adapting (4) for w_n^N and $n_n' > 1$ and using (17). Thus, for any N_n', $n_n' > 1$, $w_1^N, w_2^N \in N_n'$, w_n^N strictly prefers not running over running. Given that w_1^N and w_2^N run, not running strictly dominates running for w_n^N. Thus, w_n^N does not run.

Next, consider agent w_{n-1}^N and any strategy profile N_{n-1}' such that $w_1^N, w_2^N \in N_{n-1}'$ and $w_n^N \notin N_{n-1}'$. The problem facing w_{n-1}^N is the same as the one facing w_n^N above. By the same reasoning, for any N_{n-1}', $w_1^N, w_2^N \in N_{n-1}'$, and $w_n^N \notin N_{n-1}'$, w_{n-1}^N strictly prefers not running over running. Given that w_1^N and w_2^N run and w_n^N does not run, not running strictly dominates running for w_{n-1}^N. Thus, w_{n-1}^N does not run. By iteration, the same reasoning and implication holds for agents $w_{n-2}^N, \ldots, w_3^N$. Therefore, $N' = \{w_1^N, w_2^N\}$. ■

Proposition 3

Proof. A larger n reduces $w_2^N = w_{p+2-n}$, increasing enforcement by Propositions 1–2. ■

Proposition 4

Proof. Every admissible qualified electorate has at least one appropriator, and the majority of voters are producers. By assuming that $p-2 > a > 0$, these are also the only assumptions made in the case when the whole population can vote. Therefore, the entire analysis and thus the equilibrium outcome are exactly the same as if the whole population can vote. ■

Proposition 5

Proof. Suppose that $p-2 < a$ so that appropriators constitute the majority among voters. I solve the model backwards, first the political game, then the selection game.

First, consider an equilibrium of the political game between two candidates w_k and w_{-k} who propose the regimes (θ_k, τ_k) and (θ_{-k}, τ_{-k}), respectively. At least one candidate—without loss of generality, assume w_k—wins the election with positive probability. Then, $\nu(\theta_k, \tau_k) \geq \nu(\theta_{-k}, \tau_{-k}) \geq 0$ as w_k loses the election with certainty otherwise. I proceed in steps.

1. Suppose for a contradiction that $\nu(\theta_k, \tau_k) > \nu(\theta_{-k}, \tau_{-k}) \geq 0$. Then, w_k wins the election with certainty and gets payoff $\tilde{w}(\theta_k, \tau_k)$. As $\nu(\theta_k, \tau_k) > 0$, $\tau_k < 1$. By continuity, w_k can profitably deviate to proposing the regime $(\theta'_k, \tau'_k) = (\theta_k, \tau_k + \epsilon)$ for a small enough $\epsilon > 0$ so that $\nu(\theta'_k, \tau'_k) = \nu(\theta_k, \tau_k + \epsilon) > \nu(\theta_{-k}, \tau_{-k})$ to still win with certainty and secure a higher payoff $\tilde{w}(\theta'_k, \tau'_k) = \tilde{w}(\theta_k, \tau_k + \epsilon) > \tilde{w}(\theta_k, \tau_k)$, a contradiction. Thus, $\nu(\theta_k, \tau_k) = \nu(\theta_{-k}, \tau_{-k})$.

2. Suppose for a contradiction that $\nu(\theta_k, \tau_k) = \nu(\theta_{-k}, \tau_{-k}) = 0$. As w_{-k} loses with positive probability, their expected payoff is $\alpha\tilde{w}(\theta_{-k}, \tau_{-k}) + (1-\alpha)\varphi(\theta_k, \tau_k)w_{-k} \leq \alpha\tilde{w}(1,1) + (1-\alpha)w_{-k} = \alpha + (1-\alpha)w_{-k} < 1$ for some $\alpha \in [0, 1)$, where $\tilde{w}(1,1) = 1$ is the maximum possible in-office payoff. By continuity, w_{-k} can profitably deviate to proposing a regime $(\theta'_{-k}, \tau'_{-k}) = (1, 1-\epsilon)$ for a small enough $\epsilon > 0$ so that $\tilde{w}(\theta'_{-k}, \tau'_{-k}) = \tilde{w}(1, 1-\epsilon) > \alpha + (1-\alpha)w_{-k}$ to win with certainty, as $\nu(\theta'_{-k}, \tau'_{-k}) = \nu(1, 1-\epsilon) = \epsilon > 0 = \nu(\theta_k, \tau_k)$, and secure a higher payoff $\tilde{w}(\theta'_{-k}, \tau'_{-k})$, a contradiction. Thus, $\nu(\theta_k, \tau_k) = \nu(\theta_{-k}, \tau_{-k}) > 0$, $\theta_k > 0$, $\tau_k < 1$.

3. Suppose for a contradiction that $\theta_k < 1$. There are two cases: (i) $\tilde{w}(\theta_k, \tau_k) < \varphi(\theta_{-k}, \tau_{-k})w_k$; and (ii) $\tilde{w}(\theta_k, \tau_k) \geq \varphi(\theta_{-k}, \tau_{-k})w_k$. In Case (i), w_k's expected payoff is $\alpha\tilde{w}(\theta_k, \tau_k) + (1-\alpha)\varphi(\theta_{-k}, \tau_{-k})w_k < \varphi(\theta_{-k}, \tau_{-k})w_k$ for some $\alpha \in (0, 1]$. They can profitably deviate to proposing the regime $(\theta'_k, \tau'_k) = (\theta_k, 1)$ to lose the election with certainty, as $\nu(\theta'_k, \tau'_k) = \nu(\theta_k, 1) = 0 < \nu(\theta_{-k}, \tau_{-k})$, and secure a higher payoff $\varphi(\theta_{-k}, \tau_{-k})w_k$, a contradiction. In Case (ii), w_k's expected payoff is $\alpha\tilde{w}(\theta_k, \tau_k) + (1-\alpha)\varphi(\theta_{-k}, \tau_{-k})w_k \leq \tilde{w}(\theta_k, \tau_k)$ for some $\alpha \in (0, 1]$. They can profitably deviate to proposing the regime $(\theta'_k, \tau'_k) = (1, \tau_k)$ to win the election with certainty, as $\nu(\theta'_k, \tau'_k) = \nu(1, \tau_k) > \nu(\theta_k, \tau_k) = \nu(\theta_{-k}, \tau_{-k})$, and secure a higher expected payoff $\tilde{w}(\theta'_k, \tau'_k) = \tilde{w}(1, \tau_k) > \tilde{w}(\theta_k, \tau_k)$, a contradiction. Thus, $\theta_k = 1$.

4. Suppose for a contradiction that $(\theta_k, \tau_k) = (1, \tau_k)$ for some $\tau_k > 0$. As $\nu(1, \tau_k) = (1 - \tau_k) = \theta_{-k}(1 - \tau_{-k}) = \nu(\theta_{-k}, \tau_{-k})$, it follows that $\tilde{w}(1, \tau_k) = \tau_k \geq \tau_{-k} - g(1 - \theta_{-k}) = \tilde{w}(\theta_{-k}, \tau_{-k})$: if $\theta_{-k} < 1$, then $g(1 - \theta_{-k}) > 0$ and $(1 - \tau_k) < (1 - \tau_{-k})$ so that $\tau_{-k} < \tau_k$; if $\theta_{-k} = 1$, then $\tau_{-k} = \tau_k$. For some $\alpha \in [0, 1)$, w_{-k}'s expected payoff is $\alpha\tilde{w}(\theta_{-k}, \tau_{-k}) + (1 - \alpha)\varphi(1, \tau_k)w_{-k} = \alpha\tilde{w}(\theta_{-k}, \tau_{-k}) < \tilde{w}(1, \tau_k)$. By continuity, w_{-k} can profitably deviate to proposing $(\theta'_{-k}, \tau'_{-k}) = (1, \tau_k - \epsilon)$ for a small enough $\epsilon > 0$ so that $\tilde{w}(\theta'_{-k}, \tau'_{-k}) = \tilde{w}(1, \tau_k - \epsilon) > \alpha\tilde{w}(\theta_{-k}, \tau_{-k})$ to win the election with certainty, as $\nu(\theta'_{-k}, \tau'_{-k}) = \nu(1, \tau_k - \epsilon) > \nu(1, \tau_k)$, and secure a higher expected payoff $\tilde{w}(\theta'_{-k}, \tau'_{-k})$, a contradiction. Thus, $(\theta_k, \tau_k) = (1, 0)$.

5. Suppose for a contradiction that $(\theta_{-k}, \tau_{-k}) \neq (1, 0)$. Then, as $(\theta, \tau) = (1, 0)$ uniquely maximizes $\nu(\theta, \tau)$, $\nu(\theta_k, \tau_k) > \nu(\theta_{-k}, \tau_{-k})$, a contradiction. Thus, $(\theta_k, \tau_k) = (\theta_{-k}, \tau_{-k}) = (1, 0)$, which is the anarchy regime, and both candidates win with positive probability.

6. To verify, neither candidate can profitably deviate: both candidates win with positive probability, and as $\varphi(1, 0) = \tilde{w}(1, 0) = 0$, their expected payoff is zero; deviating to proposing any other regime loses the election with certainty because $(\theta, \tau) = (1, 0)$ uniquely maximizes appropriators' payoffs, implying a certain payoff of zero as well.

Second, consider the selection game. A strategy profile is an equilibrium if and only if at least one potential candidate chooses to run. First, suppose for a contradiction that a strategy profile is an equilibrium and no potential candidate is running. Then, anarchy prevails, and all potential candidates have payoff 0. For every potential candidate, deviating to running yields the dictator payoff $1 > 0$, a contradiction. Thus, if a strategy profile is an equilibrium, then at least one potential candidate chooses to run. Second, consider any strategy profile in which at least one potential candidate chooses to run. If exactly one potential candidate is running, then that agent becomes a dictator with payoff 1, and all other potential candidates have payoff 0. For the candidate, deviating to not running decreases their payoff from 1 to 0 because anarchy prevails. For all other potential candidates, deviating to running ensures that an election takes place, which gives them expected payoff 0. That is, the strategy profile is an equilibrium. If at least two potential candidates are running, then an election takes place, the anarchy regime is adopted, and all potential candidates, running or not, have expected payoff 0. For all potential candidates who chose to run, deviating to not running implies certain payoff 0 because either an election still takes place, delivering the anarchy regime, or a dictatorship ensues. For all potential candidates who chose not to run, deviating to running yields expected payoff 0: if they get to run in the election, then their expected payoff is 0, otherwise the adopted anarchy regime gives payoff 0. That is, the strategy profile is an equilibrium. Thus, if at least one potential candidate chooses to run, then the strategy profile is an equilibrium.

Finally, since a profile of running decisions is an equilibrium of the selection game if and only if at least one potential candidate chooses to run, there are two possible equilibrium outcomes. If exactly one potential candidate chooses to run, then that agent becomes a dictator, and the equilibrium outcome is a dictatorship. Otherwise, an election is held, and the equilibrium outcome is anarchy. ■

Proposition 6

Proof. Suppose that $\varepsilon = 0$. The proof follows from that of Proposition 1 by ignoring Step **9**, which operationalizes the preference shock. Steps **1**–**8** of the proof of Proposition 1, without any changes (except $\varepsilon = 0$), establish (9)–(11) and that in equilibrium, w_L wins the election with certainty, while w_H proposes more enforcement. From Steps **4** and **2** of the proof of Proposition 1 and w_L winning with certainty, $\varphi(\theta_L, \tau_L) w_H \geq \tilde{w}(\theta_L, \tau_L) \geq \varphi(\theta_H, \tau_H) w_L$. One case that satisfies this set of inequalities is $\varphi(\theta_L, \tau_L) w_H = \tilde{w}(\theta_L, \tau_L) > \varphi(\theta_H, \tau_H) w_L$, where the inequality follows from $w_H > w_L$ and $\varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H) > 0$ by Step **1** of the proof of Proposition 1, which gives (12). Focusing on this case and thus (9)–(12), Steps **10**–**11** of the proof of Proposition 1, without any changes, then establish that an equilibrium exists and that in at least one equilibrium, the equilibrium regime only depends on w_H and a higher w_H implies less enforcement, lower producer payoffs, and a higher office-holder payoff. ■

Proposition 7

Proof. This proof replicates the proof of Proposition 1 step by step.

1. *In equilibrium, the proposed regimes (θ_k, τ_k) and (θ_{-k}, τ_{-k}) satisfy $\varphi(\theta_k, \tau_k) = \varphi(\theta_{-k}, \tau_{-k}) > 0$.* The proof is similar to Step **1** of the proof of Proposition 1, noting that $\breve{\tilde{w}}(\cdot, \cdot; \cdot)$ is strictly increasing in τ, and the maximum possible in-office payoff is $\breve{\tilde{w}}(1, 1; \cdot) = 1$.

2. *In equilibrium, if w_k proposes (θ_k, τ_k) and wins the election with positive probability against w_{-k}, who proposes (θ_{-k}, τ_{-k}), then $\breve{\tilde{w}}(\theta_k, \tau_k; w_k) \geq \varphi(\theta_{-k}, \tau_{-k}) w_k$.* The proof is similar to Step **2** of the proof of Proposition 1.

3. *In equilibrium, if w_k proposes (θ_k, τ_k) and wins the election with positive probability against w_{-k}, who proposes (θ_{-k}, τ_{-k}), then $\varphi(\theta_k, \tau_k) w_{-k} \geq \breve{\tilde{w}}(\theta_{-k}, \tau_{-k}; w_{-k})$.* Suppose for a contradiction that $\breve{\tilde{w}}(\theta_{-k}, \tau_{-k}; w_{-k}) > \varphi(\theta_k, \tau_k) w_{-k}$. From Step **1** follows that $\varphi(\theta_k, \tau_k) = \varphi(\theta_{-k}, \tau_{-k}) > 0$. It follows that $(\theta_{-k}, \tau_{-k}) \in (0, 1)^2$. Then, for some $\alpha \in [0, 1)$, w_{-k}'s expected payoff is $\alpha \breve{\tilde{w}}(\theta_{-k}, \tau_{-k}; w_{-k}) + (1 - \alpha) \varphi(\theta_k, \tau_k) w_{-k} < \breve{\tilde{w}}(\theta_{-k}, \tau_{-k}; w_{-k})$. By continuity, w_{-k} can profitably deviate to proposing $(\theta'_{-k}, \tau'_{-k}) = (\theta_{-k}, \tau_{-k} - \epsilon)$ for a small enough $\epsilon > 0$ so that $\breve{\tilde{w}}(\theta'_{-k}, \tau'_{-k}; w_{-k}) = \breve{\tilde{w}}(\theta_{-k}, \tau_{-k} - \epsilon; w_{-k}) > \alpha \breve{\tilde{w}}(\theta_{-k}, \tau_{-k}; w_{-k}) + (1 - \alpha) \varphi(\theta_k, \tau_k) w_{-k}$ to win the election with certainty, as $\varphi(\theta'_{-k}, \tau'_{-k}) = \varphi(\theta_{-k}, \tau_{-k} - \epsilon) > \varphi(\theta_{-k}, \tau_{-k}) = \varphi(\theta_k, \tau_k)$, and secure a higher expected payoff $\breve{\tilde{w}}(\theta'_{-k}, \tau'_{-k}; w_{-k})$, a contradiction.

4. *In equilibrium, if w_k proposes (θ_k, τ_k) and wins the election with positive probability against w_{-k}, who proposes (θ_{-k}, τ_{-k}), then $\varphi(\theta_k, \tau_k) w_{-k} \geq \breve{\tilde{w}}(\theta_k, \tau_k; w_{-k})$.* Suppose for a contradiction that $\breve{\tilde{w}}(\theta_k, \tau_k; w_{-k}) > \varphi(\theta_k, \tau_k) w_{-k} > 0$, where the second inequality follows from Step **1**. It follows that $(\theta_k, \tau_k) \in (0, 1)^2$. From Step **3** follows that

$\breve{\tilde{w}}(\theta_k, \tau_k; w_{-k}) > \varphi(\theta_k, \tau_k)w_{-k} \geq \breve{\tilde{w}}(\theta_{-k}, \tau_{-k}; w_{-k})$. Then, for some $\alpha \in [0, 1)$, w_{-k}'s expected payoff is $\alpha\breve{\tilde{w}}(\theta_{-k}, \tau_{-k}; w_{-k}) + (1 - \alpha)\varphi(\theta_k, \tau_k)w_{-k} \leq \varphi(\theta_k, \tau_k)w_{-k} < \breve{\tilde{w}}(\theta_k, \tau_k; w_{-k})$. By continuity, w_{-k} can profitably deviate to proposing $(\theta'_{-k}, \tau'_{-k}) = (\theta_k, \tau_k - \epsilon)$ for a small enough $\epsilon > 0$ so that $\breve{\tilde{w}}(\theta'_{-k}, \tau'_{-k}; w_{-k}) = \breve{\tilde{w}}(\theta_k, \tau_k - \epsilon; w_{-k}) > \varphi(\theta_k, \tau_k)w_{-k}$ to win the election with certainty, as $\varphi(\theta'_{-k}, \tau'_{-k}) = \varphi(\theta_k, \tau_k - \epsilon) > \varphi(\theta_k, \tau_k)$, and secure a higher expected payoff $\breve{\tilde{w}}(\theta'_{-k}, \tau'_{-k}; w_{-k})$, a contradiction.

5. *In equilibrium, w_L wins the election with certainty.* Suppose for a contradiction that w_H wins the election with positive probability. Then, by Steps **2** and **1**, $\breve{\tilde{w}}(\theta_H, \tau_H; w_H) \geq \varphi(\theta_L, \tau_L)w_H = \varphi(\theta_H, \tau_H)w_H$ so that $\tilde{w}(\theta_H, \tau_H) \geq \varphi(\theta_H, \tau_H)\gamma w_H > \varphi(\theta_H, \tau_H)\gamma w_L$. By Step **4**, $\varphi(\theta_H, \tau_H)w_L \geq \breve{\tilde{w}}(\theta_H, \tau_H; w_L)$ so that $\varphi(\theta_H, \tau_H)\gamma w_L \geq \tilde{w}(\theta_H, \tau_H)$. Together, these imply that $\tilde{w}(\theta_H, \tau_H) \geq \varphi(\theta_H, \tau_H)\gamma w_H > \varphi(\theta_H, \tau_H)\gamma w_L \geq \tilde{w}(\theta_H, \tau_H)$, a contradiction.

6. *In equilibrium, $(\theta_L, \tau_L) \neq (\theta_H, \tau_H)$.* See Step **6** of the proof of Proposition 1.

7. *In equilibrium, $\nu(\theta_L, \tau_L) > \nu(\theta_H, \tau_H)$ and $(1 - \theta_L) < (1 - \theta_H)$.* See Step **7** of the proof of Proposition 1. Thus,

$$\nu(\theta_L, \tau_L) > \nu(\theta_H, \tau_H). \tag{19}$$

8. *In equilibrium, the regime (θ_L, τ_L) that w_L proposes solves*

$$\max_{(\theta,\tau)\in[0,1]^2} \tilde{w}(\theta, \tau) + \varphi(\theta, \tau)(1 - \gamma)w_L \quad s.t. \quad \varphi(\theta, \tau) \geq \bar{\varphi} = \varphi(\theta_H, \tau_H). \tag{P$'$}$$

The proof is similar to Step **8** of the proof of Proposition 1. Thus, (θ_L, τ_L) and (θ_H, τ_H) satisfy (the constraint and Steps **2** and **1** imply that $(\theta_L, \tau_L) \in (0, 1)^2$)

$$g'(1 - \theta_L)(1 - \theta_L) = (1 - \tau_L), \tag{20}$$

$$\varphi(\theta_H, \tau_H) = \varphi(\theta_L, \tau_L). \tag{21}$$

Notice that the system (20)–(21) is identical to the system (10)–(11) and that a solution (θ_L, τ_L) to Problem (P$'$) is independent of the productivity w_L of the agent who solves it.

9. *In equilibrium, $\varphi(\theta_L, \tau_L)w_H = \breve{\tilde{w}}(\theta_L, \tau_L; w_H)$ and the preference shock gives neither candidate an advantage and thus has no effect.* As w_L wins the election with certainty by Step **5**, from Steps **4** and **2**, $\varphi(\theta_L, \tau_L)w_H \geq \breve{\tilde{w}}(\theta_L, \tau_L; w_H) > \breve{\tilde{w}}(\theta_L, \tau_L; w_L) \geq \varphi(\theta_H, \tau_H)w_L$. The proof is similar to Step **9** of the proof of Proposition 1. Therefore,

$$\varphi(\theta_L, \tau_L)w_H = \breve{\tilde{w}}(\theta_L, \tau_L; w_H) = \tau_L - g(1 - \theta_L) + \varphi(\theta_L, \tau_L)(1 - \gamma)w_H. \tag{22}$$

10. *In equilibrium, (θ_L, τ_L) is unique and only depends on w_H. A higher w_H implies less enforcement, lower producer payoffs, and a higher office-holder payoff.* Collecting (19)–(22):

$$\varphi(\theta_L, \tau_L)\gamma w_H = \tau_L - g(1-\theta_L), \tag{23}$$

$$g'(1-\theta_L)(1-\theta_L) = (1-\tau_L) \tag{24}$$

$$\varphi(\theta_H, \tau_H) = \varphi(\theta_L, \tau_L) \text{ and } \nu(\theta_H, \tau_H) < \nu(\theta_L, \tau_L). \tag{25}$$

The system (23)–(25) is exactly the same as the system (13)–(15), except for the factor $\gamma > 0$ multiplying w_H in Equation (23). It follows that the rest of the description of the candidate equilibrium regimes is exactly as before, except for γ multiplying w_H. The effects of variations in the election loser productivity w_H for $(1-\theta_L)$, $(1-\tau_L)$, and $\varphi(\theta_L, \tau_L)$ are thus exactly as before. As to the office-holder payoff, in equilibrium, using (24), it can be written as

$$\begin{aligned}
\breve{\tilde{w}}(\theta_L, \tau_L; w_L) &= \tilde{w}(\theta_L, \tau_L) + \varphi(\theta_L, \tau_L)(1-\gamma)w_L \\
&= \tau_L - g(1-\theta_L) + (1-\theta_L)(1-\tau_L)(1-\gamma)w_L \\
&= 1 - g'(1-\theta_L)(1-\theta_L) - g(1-\theta_L) + g'(1-\theta_L)(1-\theta_L)^2(1-\gamma)w_L.
\end{aligned}$$

This expression is strictly decreasing in $(1-\theta_L)$ because the derivative w.r.t. $(1-\theta_L)$ is

$$-\left(g''(1-\theta_L)(1-\theta_L) + 2g'(1-\theta_L)\right)\left[1 - (1-\theta_L)(1-\gamma)w_L\right] < 0,$$

as $w_L < 1$. Thus, a higher w_H decreases $(1-\theta_L)$ and thus increases the office-holder payoff.

11. *Neither candidate can profitably deviate.* Given (θ_H, τ_H), w_L cannot increase their expected payoff $\breve{\tilde{w}}(\theta_L, \tau_L; w_L)$, which using (23) and (25) can be written as

$$\tilde{w}(\theta_L, \tau_L) + \varphi(\theta_L, \tau_L)(1-\gamma)w_L = \varphi(\theta_L, \tau_L)\gamma w_H + \varphi(\theta_L, \tau_L)(1-\gamma)w_L > \varphi(\theta_H, \tau_H)w_L,$$

by deviating. No other regime that w_L can propose to win the election with positive probability—a necessary condition for which is for it to be in the constraint set of Problem (P′)—gives a higher in-office payoff than (θ_L, τ_L) as (θ_L, τ_L) solves Problem (P′). Deviating to proposing a regime with which w_L loses the election with certainty, w_L would earn a strictly lower payoff. Similarly, given (θ_L, τ_L), w_H cannot increase their expected payoff $\varphi(\theta_L, \tau_L)w_H$ by deviating. Any deviation to a regime with which w_H still loses the election with certainty does not affect payoffs. From Problem (P′), the solution to which is independent of the productivity of the agent who solves it, the highest in-office payoff from a regime (θ', τ') that w_H can propose to win with positive probability, which requires that $\varphi(\theta', \tau') \geq \varphi(\theta_L, \tau_L) = \varphi(\theta_H, \tau_H)$, is $\tilde{w}(\theta_L, \tau_L) + \varphi(\theta_L, \tau_L)(1-\gamma)w_H = \varphi(\theta_L, \tau_L)w_H$, where the equality follows from (23). Thus, the set of proposals described is an equilibrium. ■

References

Acemoglu, D. (1995). Reward Structures and the Allocation of Talent. *European Economic Review 39*(1), 17–33.

Acemoglu, D. (2003). Why Not a Political Coase Theorem? Social Conflict, Commitment and Politics. *Journal of Comparative Economics 31*(4), 620–652.

Acemoglu, D. (2005). Politics and Economics in Weak and Strong States. *Journal of Monetary Economics 52*(7), 1199–1226.

Acemoglu, D. (2006). A Simple Model of Inefficient Institutions. *The Scandinavian Journal of Economics 108*(4), 515–546.

Acemoglu, D. (2008). Oligarchic Versus Democratic Societies. *Journal of the European Economic Association 6*(1), 1–44.

Acemoglu, D. and J. A. Robinson (2000). Why Did the West Extend the Franchise? Democracy, Inequality, and Growth in Historical Perspective. *The Quarterly Journal of Economics 115*(4), 1167–1199.

Acemoglu, D. and J. A. Robinson (2001). A Theory of Political Transitions. *The American Economic Review 91*(4), 938–963.

Acemoglu, D. and J. A. Robinson (2006). De Facto Political Power and Institutional Persistence. *The American Economic Review 96*(2), 325–330.

Acemoglu, D. and J. A. Robinson (2008). Persistence of Power, Elites, and Institutions. *The American Economic Review 98*(1), 267–293.

Acemoglu, D., J. A. Robinson, and T. Verdier (2004). Kleptocracy and Divide-and-Rule: A Model of Personal Rule. *Journal of the European Economic Association 2*(2-3), 162–192.

Acemoglu, D. and T. Verdier (1998). Property Rights, Corruption and the Allocation of Talent: A General Equilibrium Approach. *The Economic Journal 108*, 1381–1403.

Besley, T. and S. Coate (1997). An Economic Model of Representative Democracy. *The Quarterly Journal of Economics 112*(1), 85–114.

Besley, T., J. G. Montalvo, and M. Reynal-Querol (2011). Do Educated Leaders Matter? *The Economic Journal 121*(554), F205–227.

Besley, T. and T. Persson (2009). The Origins of State Capacity: Property Rights, Taxation, and Politics. *The American Economic Review 99*(4), 1218–1244.

Besley, T. and T. Persson (2010). State Capacity, Conflict, and Development. *Econometrica 78*(1), 1–34.

Besley, T., T. Persson, and D. M. Sturm (2010). Political Competition, Policy and Growth: Theory and Evidence from the US. *The Review of Economic Studies 77*(4), 1329–1352.

Besley, T. and M. Reynal-Querol (2011). Do Democracies Select More Educated Leaders? *American Political Science Review 105*(3), 552–566.

Brusco, S. and J. Roy (2011). Aggregate Uncertainty in the Citizen Candidate Model Yields Extremist Parties. *Social Choice and Welfare 36*(1), 83–104.

Cao, D. and R. Lagunoff (2020). The Dynamics of Property Rights and Consent in Autocracies. Available at SSRN: https://ssrn.com/abstract=3580853.

Caselli, F. and M. Morelli (2004). Bad Politicians. *Journal of Public Economics 88*(3-4), 759–782.

Corvalan, A., P. Querubín, and S. Vicente (2018, 12). The Political Class and Redistributive Policies. *Journal of the European Economic Association 18*(1), 1–48.

Dal Bó, E., P. Dal Bó, and J. Snyder (2009). Political Dynasties. *The Review of Economic Studies 76*(1), 115–142.

Diamond, L. J. (2002). Thinking About Hybrid Regimes. *Journal of Democracy 13*(2), 21–35.

Engerman, S. L. and K. L. Sokoloff (2005). The Evolution of Suffrage Institutions in the New World. *The Journal of Economic History 65*(4), 891–921.

Gersbach, H. (2004). Why One Person One Vote? *Social Choice and Welfare 23*(3), 449–464.

Gersbach, H. (2009). Competition of Politicians for Wages and Office. *Social Choice and Welfare 33*(1), 51–71.

Gradstein, M. (2007). Inequality, Democracy and the Protection of Property Rights. *The Economic Journal 117*(516), 252–269.

Hall, R. E. and C. I. Jones (1999). Why Do Some Countries Produce So Much More Output Per Worker Than Others? *The Quarterly Journal of Economics 114*(1), 83–116.

Herrera, H. and C. Martinelli (2013). Oligarchy, Democracy, and State Capacity. *Economic Theory 52*, 165–186.

Knack, S. and P. Keefer (1995). Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures. *Economics and Politics 7*(3), 207–227.

Konrad, K. A. and S. Skaperdas (2012). The Market for Protection and the Origin of the State. *Economic Theory 50*, 417–443.

Lizzeri, A. and N. Persico (2004). Why Did the Elites Extend the Suffrage? Democracy and the Scope of Government, with an Application to Britain's "Age of Reform". *The Quarterly Journal of Economics 119*(2), 707–765.

Marshall, M. G., T. R. Gurr, and K. Jaggers (2016). Polity IV Project: Political Regime Characteristics and Transitions, 1800-2015. Dataset Users' Manual.

Messner, M. and M. K. Polborn (2004). Paying Politicians. *Journal of Public Economics 88*(12), 2423–2445.

Miller, F. H. (1900). Legal Qualifications for Office in America. In Annual Report of the American Historical Association for the Year 1899, by American Historical Association, 89–153. Washington, DC: GPO.

Moselle, B. and B. Polak (2001). A Model of a Predatory State. *The Journal of Law, Economics, and Organization 17*(1), 1–33.

Murphy, K. M., A. Shleifer, and R. W. Vishny (1993). Why Is Rent-Seeking So Costly to Growth? *The American Economic Review, Papers and Proceedings 83*(2), 409–414.

North, D. C., J. J. Wallis, S. B. Webb, and B. R. Weingast (2007). Limited Access Orders in the Developing World: A New Approach to the Problems of Development. Policy Research Working Paper; No. 4359. World Bank, Washington, DC.

North, D. C., J. J. Wallis, and B. R. Weingast (2006). A Conceptual Framework for Interpreting Recorded Human History. NBER Working Paper 12795.

Olson, M. (1993). Dictatorship, Democracy, and Development. *American Political Science Review 87*(3), 567–576.

Osborne, M. J. and A. Slivinski (1996). A Model of Political Competition with Citizen-Candidates. *The Quarterly Journal of Economics 111*(1), 65–96.

Padovano, F. and R. Ricciuti (2009). Political Competition and Economic Performance: Evidence from the Italian Regions. *Public Choice 138*(3-4), 263–277.

Paxton, P., K. A. Bollen, D. M. Lee, and H. Kim (2003). A Half-Century of Suffrage: New Data and a Comparative Analysis. *Studies in Comparative International Development 38*(1), 93–122.

Persson, T., G. Roland, and G. Tabellini (1997, 11). Separation of Powers and Political Accountability. *The Quarterly Journal of Economics 112*(4), 1163–1202.

Persson, T., G. Roland, and G. Tabellini (1998). Towards Micropolitical Foundations of Public Finance. *European Economic Review 42*(3), 685 – 694.

Persson, T., G. Roland, and G. Tabellini (2000). Comparative Politics and Public Finance. *Journal of Political Economy 108*(6), 1121–1161.

Plott, C. R. (1967). A Notion of Equilibrium and its Possibility Under Majority Rule. *The American Economic Review 57*(4), 787–806.

Shepsle, K. A. and B. R. Weingast (1981). Structure-Induced Equilibrium and Legislative Choice. *Public Choice 37*(3), 503–519.

Svaleryd, H. and J. Vlachos (2009). Political Rents in a Non-Corrupt Democracy. *Journal of Public Economics 93*(3-4), 355–372.