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By

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Political Selection and the Concentration of Political Power

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Abstract

This paper studies the effects of power-concentrating institutions on the quality of political selection, i.e., the voters' capacity to identify and empower well-suited politicians. In our model, candidates are heterogeneous in two unobservable quality aspects: ability and public-spiritedness. As voters can only base their ballots on the candidates' binding policy proposals, low-quality candidates face incentives to mimic their high-quality counterparts and a selection problem arises. We find that power-concentrating institutions amplify this selection problem as they increase electoral stakes and thus the incentives for mimicking. However, they also allocate more political power to the voters' preferred candidate. As a consequence, the optimal institutional setting depends on the conflict of interest between voters and candidates. The larger the conflict of interest, the smaller is the level of power concentration that maximizes voter welfare. A complete concentration of power in the hands of the election winner is optimal if and only if the conflict of interest is small.

Keywords: Elections, Constitutional Design, Selection, Asymmetric Information

JEL classification: D72, D82, H11

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1 Introduction

The concept of representative democracy is based on the premise that voters are capable to identify and empower well-suited politicians. Typically, voters do not only care about policy platforms, but also about the quality of candidates, such as their skills and integrity. As candidates are privately informed about these characteristics, however, they can improve their electoral prospects by choosing actions that signal high quality. This reduces the voters' capacity to identify the best-suited candidate. Hence, a selection problem arises that threatens the premise of representative democracy. The issue of political selection has been considered critical for democratic systems in the political economics literature as well as in public debate, with prominent quotes dating back to the founding of the United States.¹

In this paper, we investigate how political institutions can improve the quality of political selection. In particular, we study the relationship between political selection and the concentration of political power, a key characteristic of political institutions. Virtually all institutions affect how much political power goes to the election winner, and how much political influence is reserved to the election losers or to other political actors. Empirically, there are large differences along this dimension even across established democracies: While power is strongly concentrated in some countries as the United Kingdom, it is much more dispersed in other countries as Switzerland or Belgium. In comparative political science, the level of power concentration has consequently become the dominant criterion for the classification of political systems (see, e.g., Tsebelis 2002, Lijphart 1999, 2012).

We find that power-concentrating institutions have two countervailing effects on the performance of political systems. On the one hand, they reduce the quality of political selection, i.e., the voters' capacity to identify well-suited candidates. On the other hand, voters benefit from institutions that provide more power to the election winner, if they have been able to elect the better-suited candidate. Voter welfare is maximized at the level of power concentration that balances these countervailing effects. We show that limiting the concentration of power is optimal if and only if the conflict of interest between voters and candidates is sufficiently large. Moreover, the larger this conflict, the smaller is the welfare-maximizing level of power concentration.

To study the effects of power concentration on political selection and welfare, we

¹“The aim of every political Constitution, is or ought to be, first to obtain for rulers men who possess most wisdom to discern, and most virtue to pursue, the common good of society; and in the next place, to take the most effectual precautions for keeping them virtuous whilst they continue to hold their public trust” (Madison 1788*b*, in the Federalist #57). A survey on the political economics literature is provided by Besley (2005).

develop a stylized model with a representative voter and two candidates.² Candidates compete in a public election by making binding policy proposals: They either propose a risky reform or the (riskless) status quo. Based on these proposals, the voter casts his vote. Candidates are heterogeneous in ability and motivation, both commonly discussed aspects of candidate quality. High-ability candidates are capable of designing and implementing reforms that increase voter welfare, while low-ability candidates should stick to the status quo. Egoistic candidates are mainly driven by a desire to acquire political power (office rents), while public-spirited candidates care more intensely about voter welfare. The conflict of interest depends on, first, the share of egoistic candidates, and second, the extent to which egoistic candidates care about office rents. Political institutions determine the distribution of political power between election winner and loser. With fully concentrated power, the adopted policy is identical to the winner's proposal. With dispersed power, a compromise between both proposals is implemented.

Our model hence defines a signaling game with a continuum of two-dimensional types and a continuum of actions. We show that this game has a unique Perfect Bayesian equilibrium that is robust to the D1 refinement by Cho & Kreps (1987). In this equilibrium, egoistic candidates with low ability mimic the behavior of public-spirited candidates with higher ability in order to increase their electoral prospects.

We find that power-concentrating institutions have a negative *selection effect*. Because power-concentrating political institutions increase electoral stakes, they induce more mimicking and reduce the voter's capability to take well-informed electoral choices. With respect to voter welfare, however, they also have a positive *empowerment effect*. As long as political campaigns confer at least some information about candidate qualities, the voter selects the candidate that provides in expectation the highest welfare. Thus, power-concentrating institutions give on average more influence to the better-suited candidate, which increases voter welfare *ceteris paribus*. Voter welfare is maximized at the level of power concentration that balances the negative *selection effect* and the positive *empowerment effect*.

The optimal level of power concentration depends on the conflict of interest between voter and candidates, with respect to both the probability that a candidate is egoistic and the extent to which egoistic candidates are driven by the desire to obtain power. If the conflict of interest is small, it is optimal to concentrate power completely in the hands of the election winner. The larger the conflict of interest, the lower is the optimal concentration of political power. The basic intuition behind

²The assumption of a representative voter is taken to simplify the exposition. All results extend to a model with heterogeneous voters (see Section 7).

this result is the following: A larger conflict of interest induces more mimicking and reduces the informativeness of campaigns, i.e., aggravates the selection problem. As a consequence, it becomes more beneficial to decrease these inefficiencies by means of power-dispersing institutions, even though this involves giving some power to inferior candidates.

To make the link between power concentration and political selection as transparent as possible, our basic model considers a setting with a representative voter. However, our results prevail in more general settings. In particular, we can replace the representative voter by a continuous set of voters with heterogeneous policy preferences. In this case, elections also serve as devices for preference aggregation. This model allows us to study more complex institutional settings, for which our results continue to hold. It also enables us to relate the aspect of political selection to another argument for introducing power-dispersing institutions: their capacity to foster the representation of political minorities. We find that problems of political selection and a desire for minority representation can be regarded as two independent motives for reducing the concentration of political power: If both motives are considered, the optimal level of power concentration is always lower than if only one of these is taken into account.

Finally, we confront the predictions of our model with cross-country data for a sample of established democracies. While a rigorous empirical test is beyond the scope of this paper, the available data is in line with our theoretical results: Power-concentrating institutions seem to be beneficial in countries where voters evaluate their representatives as mainly public-spirited. In contrast, the analysis indicates negative effects of power concentration in countries where politicians are assessed as more egoistic.

The paper proceeds as follows. The next section reviews the related literature. Section 3 presents the model. Section 4 delivers a benchmark case of perfect information. Thereafter, we analyze equilibrium behavior under two-dimensional private information in Section 5. We examine the effects of power-concentrating institutions in Section 6. Section 7 discusses important extensions of our theoretical model, and Section 8 briefly describes the results of our empirical analysis. Section 9 concludes. The Appendix provides all formal proofs and the details of the empirical analysis.

2 Related literature

This paper analyzes how power concentration affects political selection and welfare. In general, the quality of politicians in office depends on, first, which citizens choose

to become political candidates and run for office, and second, which politicians are selected by the voters from a given pool of candidates.³

Regarding the first aspect, the allocation of power within the political system affects the payoff from public office and thereby the attractiveness of running for office. Iaryczower & Mattozzi (2013) compare electoral systems and their effect on the candidate pool. They show that, if candidates cannot invest in their quality, neither majoritarian nor proportional elections clearly attract a higher-quality pool of candidates. Smart & Sturm (2013) analyze term limits and show that they reduce the value of holding office more strongly for public-spirited candidates than for egoistic candidates. Term limits may consequently compromise the quality of political candidates.

This paper concentrates on the second aspect, the quality of political selection from a given pool of candidates. In order to cast their ballots for a candidate of high quality, voters draw inferences from candidates' observable actions. Voters may either use candidates' pre-election behavior, i.e., the policies they propose during their campaigns, or candidates' post-election behavior, i.e., the policies they implement while in office. Since candidates can distort their actions to signal quality and to increase their electoral prospects, none of these sources is likely to provide unbiased information.

If candidates can commit to policies before the election, campaign proposals are informative. Hence, voters can use them to infer candidates' qualities. However, candidates may distort their policy choice to signal policy motivation (Callander 2008), competence (Honryo 2013), or commitment (Kartik & McAfee 2007, Callander & Wilkie 2007). Our model is similar to these models, as it allows for commitment and studies behavior in political campaigns. If campaigns are instead uninformative because politicians are not committed to them, voters have to rely on politicians' post-election behavior to infer their qualities. However, politicians may opportunistically choose popular policies that do not maximize welfare (Harrington 1993) or may be reluctant to revert failed policies (Majumdar & Mukand 2004). These distortion in policy choice reduces the information of voters and their capacity to select high-quality politicians. While these papers document the relevance of the problem of political selection, they do not analyze the effects of institutions on this problem.

As political institutions shape politicians' behavior, they ought to have an influence on voters' capability to select and empower high-ability candidates. This effect of political institutions has been studied by only a small number of papers. None of these considers the aspect of power concentration. Closest to us is the paper by

³For a general discussion of the issue of political selection, see Besley (2005).

Besley & Smart (2007), who study the effects of several fiscal restraints – in particular, inefficient taxation, limits on the size of government, increasing transparency, and yard stick competition – on political selection. As these restraints reduce the incumbent’s scope of action, their adoption is similar in spirit to a reduction in power concentration. However, the results of Besley & Smart (2007) differ strongly from ours. They find that most fiscal restraints can only be beneficial if politicians are likely to be public-spirited, i.e., if the conflict of interest between voters and politicians is small. In contrast, we show that limiting the concentration of power is beneficial whenever the conflict of interest is sufficiently large.

A crucial difference to our paper is that Besley & Smart (2007) assume that politicians cannot credibly commit to policies before the election. Hence, their analysis focuses on the effects of institutions on post-election behavior and reelection probabilities of a randomly chosen incumbent. In their model, egoistic incumbents can either mimic public-spirited politicians in order to be reelected, or reveal their types by extracting high rents. They argue that fiscal restraints reduce the rents that incumbents can extract without revealing their types. Hence, egoistic types find mimicking less profitable and extract more rents, i.e., a negative disciplining effect occurs. However, this behavioral change also induces a positive selection effect, as it helps voters to distinguish between egoistic and public-spirited politicians. The positive selection effect dominates the negative disciplining effect if and only if politicians are likely to be public-spirited.⁴

In similar settings, Maskin & Tirole (2004) and Smart & Sturm (2013) study the effects of political accountability on political selection and voter welfare. As in Besley & Smart (2007), they assume that commitment is not possible prior to the election. Maskin & Tirole (2004) analyze conditions under which public officials should be held accountable by reelections. They show that the incentive to pander to public opinion reduces the attractiveness of holding public officials accountable and that some political decisions should be made by officials that are not subject to reelection. Smart & Sturm (2013) study the effects of term limits, which allow to vary the level of electoral accountability and reduce the value of holding office. The introduction of term limits give rise to a similar tradeoff as in Besley & Smart (2007), inducing politicians to behave more in line with their preferences and helping to distinguish public-spirited from egoistic candidates. The value of term limits hence increases with the probability that a randomly drawn candidate is public-spirited.

⁴Another difference between both papers is related to the modeling of candidate heterogeneity. While Besley & Smart (2007) study a model in which candidates differ in their motivations (public-spirited or egoistic), candidates in our model are heterogeneous in two quality aspects, motivation and ability.

Overall, we complement the previous literature on political selection in two ways. First, we investigate the effects of power concentration, a so far neglected aspect of political institutions. Second, we study the dependence between selection and institutions in a model with commitment, where electoral campaigns are informative. This setting allows us to identify a novel channel through which institutions affect the quality of political selection.⁵

3 The model

We study an electoral setting with two candidates and one voter. The candidates differ in their motivations – they are either egoistic or public-spirited – and in their abilities to design policies that enhance voter welfare. Both characteristics are unobservable to the voter. The policy space is given by the unit interval $[0, 1]$ and represents the amount of reform, where 0 corresponds to the riskless status quo and 1 to a full-scale reform. All reforms are costly and risky. The voter elects one candidate, thereby allocating political power, i.e., the right to set policy. Depending on the institutional setting, power is allocated either completely to the election winner, or is divided between both candidates.

The game consists of three stages. At the first stage, nature independently draws both candidates' two-dimensional private types. At the second stage, candidates simultaneously make binding policy proposals, x_1 and x_2 . At the third stage, the voter observes the proposals, and casts his vote. Based on the political institutions, political power is distributed between election winner and loser, and a policy decision is taken.

3.1 Institutions

Political institutions prescribe the amount of political power enjoyed by the election winner, and the amount given to the loser. Formally, the political power of candidate i is given by

$$\pi_i(w, \rho) = \begin{cases} \rho & \text{if } w = i, \text{ i.e., } i \text{ is election winner} \\ 1 - \rho & \text{if } w \neq i, \text{ i.e., } i \text{ is election loser.} \end{cases} \quad (1)$$

⁵Note that our results remain valid as long as campaigns are informative for electoral choice. For example, they extend to cases with partial commitment, in which candidates are bound by their proposals with some probability. For a discussion of the classical distinction between (pre-election) models with commitment and (post-election) models without commitment, see Persson & Tabellini (2000).

The parameter $\rho \in [\frac{1}{2}, 1]$ represents the institutional setting, with higher values of ρ implying more concentrated political power. If power is fully concentrated, ρ equals unity, and all political power is enjoyed by the election winner. If power is dispersed, the election loser also attains some say on policy choice. In this case, every politician can implement a part of his policy proposal x_i that corresponds to his share of power. Hence, the implemented policy x is given by a compromise between the proposals of both candidates, $x = \pi_1 x_1 + (1 - \pi_1)x_2$.

3.2 Voter

The representative voter is risk-neutral. His utility depends on the (stochastic) outcome of the adopted policy. If a reform of magnitude $x \in [0, 1]$ is implemented and succeeds, the voter's return is x . If the reform instead fails, he receives a return of zero. Independent of its success, the reform adoption gives rise to a cost of cx (with $0 < c < 1$), which the voter bears. Thus, the voter benefits from the reform if and only if it succeeds. In summary, if the implemented policy is given by x , the voter receives the payoff

$$v(x) = \begin{cases} (1 - c)x & \text{if reform succeeds} \\ -cx & \text{if reform fails.} \end{cases} \quad (2)$$

As explained above, the implemented policy x depends on the institutional setting. If political power is dispersed, both candidates are entitled to implement parts of their policy proposals. Thus, the voter's ex post utility follows as

$$V(\pi_1, x_1, x_2) = v[\pi_1 x_1] + v[(1 - \pi_1)x_2]. \quad (3)$$

The representative voter chooses a candidate as the election winner $w \in \{1, 2\}$. As candidates' characteristics are unobservable, he can condition his electoral choice only on the policies proposed by both candidates. His voting strategy $s : [0, 1]^2 \mapsto [0, 1]$ specifies for each combination of reform proposals (x_1, x_2) the probability that candidate 1 wins the election. This notation allows to capture mixed voting strategies.

3.3 Candidates

Candidates are heterogeneous in and privately informed about two quality-related characteristics, their abilities and their motivations. First, they differ in their abilities to design a welfare-enhancing reform. The ability of candidate $i \in \{1, 2\}$ is

measured by the idiosyncratic probability $a_i \in [0, 1]$ that his reform succeeds. Both candidates' abilities are realizations of two identically and independently distributed random variables with twice continuously differentiable cdf Φ , corresponding pdf ϕ and full support on the interval $[0, 1]$.

Second, candidates differ in their motivations, captured in the preference parameter θ_i . This parameter measures the direct utility gain that candidate i derives from each unit of political power. We interpret this utility gain as a direct psychological ego rent from having a say in politics. The parameter θ_i can take one of two possible values, θ^H or $\theta^L \in (0, \theta^H)$. In the following, we refer to candidates with preference parameter θ^H as egoistic, and candidates with θ^L as public-spirited. Both candidates' preference parameters are realizations of identically and independently distributed random variables, where $\mu \in (0, 1)$ denotes the probability that $\theta_i = \theta^H$. To simplify the exposition, we assume that abilities and motives are independently distributed.⁶

Following Maskin & Tirole (2004), we assume that the candidates are driven by a mixture of policy considerations and office motivation. If candidate i proposes policy x_i and the election outcome is given by w , his expected utility⁷ follows as

$$U(x_i, w, a_i, \theta_i, \rho) = \underbrace{\pi_i(w, \rho)x_i(a_i - c)}_{\text{legacy payoff}} + \underbrace{\pi_i(w, \rho)\theta_i}_{\text{office rent}}. \quad (4)$$

The first term in the utility function captures the candidate's interest in providing efficient policies – in the words of Maskin & Tirole (2004), to leave a positive legacy to the public. This legacy payoff is given by the effect of candidate i 's policy on voter welfare. It depends both on the candidate's policy proposal and on his private ability a_i , i.e., the probability that this reform is successful. The second term in the utility function represents the utility candidate i receives from having power, i.e., his office rents. The preference parameter θ_i measures the relative weight that candidate i associates to the office motive compared to the legacy motive.

Candidate i maximizes his utility by choosing a strategy $X_i : [0, 1] \times \{\theta^L, \theta^H\} \mapsto [0, 1]$ that specifies a policy proposal for each combination of ability type and preference type.

To eliminate uninteresting cases, we impose a technical assumption on the joint type distribution throughout the paper. In particular, in pooling equilibria, cam-

⁶Independence between abilities and motivations represents a sufficient condition for the following results, which can be relaxed considerably. The details are available on request.

⁷To simplify the exposition, we provide the utility function of candidate i in an interim formulation, i.e., after the election has taken place, but before the stochastic reform outcome has materialized.

paigned proposals are completely uninformative to the voter, and political institutions do not affect the quality of selection. To focus on more interesting cases, we assume that the expected candidate ability satisfies $E [a_i | \theta_i = \theta^H \vee (\theta_i = \theta^L \ \& \ a_i \in [c, 1])] < c$. Hence, the expected ability is below the reform cost in a pool of candidates from which the public-spirited candidates with low ability have been removed. This condition rules out equilibria in which egoistic candidates take the same action for all ability levels $a_i \in [0, 1]$.

3.4 Equilibrium concept and normative criterion

We solve for Perfect Bayesian equilibria (PBE) of this game. Thus, an equilibrium of the game consists of a strategy profile (X_1, X_2, s) and a belief system σ such that (1) both candidates play mutually best responses, anticipating the voter's strategy s , (2) the voter's strategy s is optimal given his beliefs σ , and (3) the voter's belief system σ is derived from the candidates' strategies X_1 and X_2 according to Bayes' rule everywhere on the equilibrium path. After studying the set of Perfect Bayesian equilibria, we apply the D1 equilibrium refinement proposed by Cho & Kreps (1987), which restricts the set of viable out-of-equilibrium beliefs. Intuitively, D1 requires that each deviation from equilibrium actions must be attributed to the type that profits most of it. Furthermore, we restrict our attention to equilibria with anonymous voting strategies. Thus, we assume that the voter treats both candidates equally, $s(x_1, x_2) = 1 - s(x_2, x_1)$, if he holds symmetrical beliefs about their types.

The aim of this paper is to analyze how power concentration affects the performance of the political system if the voter faces a selection problem. We capture this performance by two types of normative criteria. First, we study the effects of ρ on the quality of political selection, captured by the expected characteristics of the election winner. In particular, we consider the winner's expected ability and motivation, and the expected payoff from his policy. Second, we analyze the effects of ρ on the expected utility of the representative voter, which we refer to as voter welfare in the following. As we are interested in the voter's capability to select from a fixed pool of candidates, we consider all criteria in ex ante perspective, i.e., before candidates' abilities and motivations are drawn.

4 Benchmark: Perfect information

A useful benchmark is given by the case in which the voter is able to observe both candidates' characteristics perfectly. In this case, the selection problem vanishes because candidates cannot improve their electoral prospects through opportunistic

behavior. As a consequence, all candidates' policy choices are undistorted. Candidates with ability below c propose the status quo. If they proposed any positive reform amount, they would face a negative expected legacy payoff and lower electoral prospects. In contrast, candidates with ability above c , who are able to provide positive reform payoffs in expectation, propose a full-scale reform. This maximizes both their chances to win the election and their legacy payoff. In consequence, the voter prefers a reforming candidate over a non-reforming one, and reforming candidates with higher ability to those with lower ability.

This has direct implications for the normative effects of political institutions. Variations in power concentration ρ have neither an effect on the behavior of candidates nor on the informativeness of campaigns. They consequently do not affect the quality of political selection. However, power-concentrating institutions allocate more power to the winning candidate, who provides higher expected policy payoff to the voter. Hence, voter welfare strictly increases with the level of power concentration.

Proposition 1. *Under perfect information, each candidate proposes a full-scale reform if and only if his ability exceeds the reform cost c . Voter welfare is maximized if political power is concentrated completely in the hands of the election winner.*

5 Equilibrium analysis

In the remainder of this paper, we consider the general case where candidates are heterogeneous and privately informed with respect to their abilities as well as their motivations. The current section demonstrates the existence of a unique Perfect Bayesian equilibrium of this game under reasonable assumptions, and thus provides the basis for the following analysis of the effects of political institutions.

We derive this uniqueness result in several consecutive steps and explain the incentives and the behavior of candidates and the voter on the way. We start by investigating the complete set of Perfect Bayesian equilibria. We then show that only a small subset of these equilibria is robust to the D1 criterion, a standard refinement for incomplete information games with large type sets. Finally, we focus on the special case where public-spirited candidates do not care for office rents at all, $\theta_L \rightarrow 0$. For this case, a simple sufficient condition ensures equilibrium uniqueness.

The following proposition describes the behavior in Perfect Bayesian equilibria.

Proposition 2. *In every PBE, the equilibrium strategy X_i^* of candidate $i \in \{1, 2\}$ is characterized by two thresholds α_i^H, α_i^L with $0 < \alpha_i^H < \alpha_i^L < c$, and a reform level*

$b_i \in [0, 1]$ such that

$$X_i^*(a_i, \theta_i) = \begin{cases} 0 & \text{if } \theta_i = \theta^J \text{ and } a_i < \alpha_i^J, \text{ and} \\ b_i & \text{if } \theta_i = \theta^J \text{ and } a_i \geq \alpha_i^J, \end{cases} \quad (5)$$

where $J \in \{L, H\}$.

The proposition states that each candidate plays a cutoff strategy that involves at most two policies in equilibrium. To understand this, note first that there arises a monotonic relation between abilities and proposals in equilibrium. Under asymmetric information, a candidate's electoral prospects depend only on his policy proposal. Thus, the expected office rent resulting from any proposal does not vary with his private ability a_i . However, the more able the candidate is, the more beneficial are larger-scale reforms of this candidate for voter welfare and, accordingly, for his legacy payoff. In consequence, more able candidates propose weakly larger-scale reforms in every equilibrium. Correspondingly, the voter attributes larger-scale reforms to candidates with higher ability.

Second, this monotonicity in beliefs implies that candidate i proposes the same policy $b_i > 0$ for any ability above c . Independent of his ability, he can maximize his chance of winning the election by committing to the largest-scale reform proposal that is played along the equilibrium path. If his ability is above c , this maximal reform also maximizes his legacy payoff and is, therefore, strictly preferred to all other equilibrium policies.

Third, the equilibrium strategy never contains a reform smaller than b_i . By the previous arguments, such a smaller-scale reform could only be announced by candidate i with ability below c . Thus, this proposal would be associated with a negative legacy payoff to the candidate and a negative expected payoff to the voter. As the voter would anticipate this in equilibrium, every reform below b_i would lead to a lower winning probability and lower office rents than the status quo. For any $a_i < c$, candidate i 's equilibrium proposal is thus either given by the (efficient) status quo or the (inefficient) reform b_i , where the latter implies mimicking of high-ability candidates.

This binary choice of policy involves a simple tradeoff between the office motive and the legacy motive for all low-ability candidates with $a_i < c$: The reform proposal b_i is associated with a higher winning probability and higher office rents, but also with a lower legacy payoff than the status quo. While the gain in office rents is independent of a candidate's ability, his legacy loss is decreasing in a_i . Hence, there is at most one ability level $\alpha_i^J < c$, at which a candidate with motivation θ^J is

indifferent between both equilibrium actions. For all abilities above α^J , candidate i strictly prefers the risky reform b_i to the status quo. For all abilities below this cutoff, he instead strictly prefers the status quo.

Finally, egoistic candidates with parameter θ^H put more relative weight on office rents and are thus more inclined to propose a reform than public-spirited candidates. Hence, policy choice by egoistic candidates is more strongly distorted than policy choice by public-spirited candidates, i.e., $\alpha_i^H < \alpha_i^L$.

In general, there is a large set of Perfect Bayesian equilibria with different proposed reform levels b_1 and b_2 , and corresponding cutoffs. However, this set of equilibria can be reduced considerably by requiring “reasonable” off-equilibrium path beliefs through the D1 criterion proposed by Cho & Kreps (1987). In particular, the D1 criterion eliminates all equilibria with reform proposals below the full scale.

Proposition 3. *A PBE is robust to the D1 criterion if and only if both candidates’ strategies involve the full-scale reform, i.e., $b_1 = b_2 = 1$. The set of symmetric D1 equilibria is non-empty.*

Intuitively, high-ability candidates face strong incentives to propose the full-scale reform, which provides the highest voter payoff when implemented. In all PBE with $b_i < 1$, however, the full-scale reform is an off-equilibrium action. These equilibria involve by pessimistic out-off-equilibrium beliefs about candidates proposing the full-scale reform, which deter profitable deviations by high-ability candidates. However, these pessimistic beliefs are not consistent with the D1 criterion, which requires that any deviation be associated to the types that benefit most from it. In our model, a deviation to the full-scale reform is most profitable for high-ability candidates, who receive the highest legacy payoff from this action. Thus, the D1 criterion rules out the pessimistic beliefs sketched above. As a consequence, only PBE with full-scale reform proposals are robust to this refinement.

By Proposition 3, the D1 criterion does not eliminate all equilibria. In particular, there always exists at least one D1 equilibrium with symmetric cutoffs $\alpha_1^L = \alpha_2^L = \alpha^L$ and $\alpha_1^H = \alpha_2^H = \alpha^H$.

For the remainder of the paper, we impose an additional assumption that simplifies the exposition: Public-spirited candidates do not only care less for office rents than egoistic candidates, but they do not care for office rents at all. Formally, this means that we focus on the limit case of the economy in which θ^L converges to zero. In this natural limit case, public-spirited candidates choose the policies that maximize the voter’s payoff, i.e., their cutoff is at the efficient level $\alpha_i^L = c$.⁸

⁸Note that this assumption is taken for reasons of exposition only. All further results hold qualitatively for the general case $\theta^L \in (0, \theta^H)$.

The following proposition makes use of two additional pieces of notation. First, we define \underline{a} implicitly by

$$\mu \int_{\underline{a}}^1 \phi(a) (a - c) da + (1 - \mu) \int_c^1 \phi(a) (a - c) da = 0. \quad (6)$$

If the cutoff α_i^H of egoistic types is at ability level \underline{a} as defined by (6), i.e., if only egoistic candidates with ability above \underline{a} and public-spirited candidates with ability above c propose a reform, the expected reform payoff is zero. Thus, \underline{a} represents a lower bound for α_i^H : If and only if the egoistic candidates' strategy involves a higher cutoff than \underline{a} , the expected reform payoff is high enough to ensure that the voter prefers to elect reforming candidates. Second, we denote by s_{10} the probability that the voter opts for the reforming candidate if both policies are proposed. The following proposition characterizes the resulting set of D1 equilibria.

Proposition 4. *There exist only symmetric D1 equilibria. In these equilibria $\alpha_1^H = \alpha_2^H = \alpha^H < c$ and $\alpha_1^L = \alpha_2^L = c$ hold. Moreover, each equilibrium is either*

1. *an interior equilibrium with $\alpha^H \in (\underline{a}, c)$ and $s_{10} = 1$, or*
2. *a boundary equilibrium with $\alpha^H = \underline{a}$ and $s_{10} \in (\frac{1}{2}, 1]$.*

By Proposition 4, candidates behave symmetrically in every D1 equilibrium. Thus, an equilibrium is characterized by a tuple (α^H, s_{10}) such that two equilibrium conditions are satisfied. First, if the voter strictly prefers one of the candidates given α^H , he must vote accordingly, i.e., s_{10} must equal either zero or unity. Second, a candidate with type (α^H, θ^H) must be indifferent between proposing the full-scale reform and the status quo, given behavior (α^H, s_{10}) . Formally, this indifference condition is given by

$$\begin{aligned} R(\alpha^H, s_{10}, \rho) &\equiv 2 \underbrace{\left(s_{10} - \frac{1}{2} \right) \left(\rho - \frac{1}{2} \right) \theta^H}_{\text{gain in office rents}} + \underbrace{\left[\frac{1}{2} + 2K(\alpha^H) \left(s_{10} - \frac{1}{2} \right) \left(\rho - \frac{1}{2} \right) \right]}_{\text{loss in legacy payoff}} (\alpha^H - c) \\ &= 0. \end{aligned} \quad (7)$$

We refer to functions K and R as the weighted ability function and the reform incentive function, respectively. It measures the utility difference between proposing the full-scale reform and the status quo for an egoistic candidate with cutoff ability α^H , given behavior (α^H, s_{10}) and institution ρ . This utility difference is composed of two effects from proposing the reform instead of the status quo: a gain in office rents and a loss in legacy payoff. At the equilibrium values α^H and s_{10} , both effects exactly

outbalance each other. In the reform incentive function, $K(a) = \mu\Phi(a) + (1 - \mu)\Phi(c)$ denotes the probability that a randomly drawn candidate is either egoistic with ability below a , or public-spirited with ability below c . In an equilibrium with egoistic-type cutoff α^H , $K(\alpha^H)$ represents the share of candidates that propose the status quo, while the derivative $k(\alpha^H) = \mu\phi(\alpha^H)$ measures the density of egoistic candidates with cutoff ability.

Proposition 4 distinguishes between interior and boundary equilibria. Which type of equilibrium arises, depends both on the conflict of interest (θ^H, μ) and the level of power concentration ρ . In interior equilibria, the equilibrium cutoff α^H is above its lower bound \underline{a} , i.e., the average ability of reforming candidates exceeds the reform cost c . Thus, proposed reforms have a positive expected payoff. As the voter strictly prefers reforming over non-reforming candidates, the voting strategy in these equilibria is pinned down at $s_{10} = 1$. For interior equilibria, equation (7) implicitly defines the equilibrium cutoff α^H . In boundary equilibria, in contrast, α^H equals the lower bound \underline{a} , and the expected reform payoff is zero. The voter is thus indifferent between reforming and non-reforming candidates, and between all voting strategies. However, his set of optimal strategies includes a unique voting strategy $s_{10} \in (\frac{1}{2}, 1]$ that solves indifference condition (7) for $\alpha^H = \underline{a}$.

Finally, uniqueness of equilibria can be derived under the following regularity condition on the weighted ability distribution.

Assumption 1. *The weighted ability distribution $k(a)$ is bounded from above with $k(a) < \frac{1+K(a)}{c-a}$ for all $a \in [\underline{a}, c)$.*

Assumption 1 rules out ability distributions with particularly large densities at very low ability levels. It is satisfied, e.g., for the uniform distribution and every distribution with weakly increasing density. The condition is sufficient to guarantee that the reform incentive function is monotonically increasing in α . This implies, first, that at most one interior equilibrium can exist and, second, that an interior equilibrium exists if and only if there is no boundary equilibrium.⁹

Proposition 5. *Under Assumption 1, there is a unique D1 equilibrium.*

6 Effects of power-concentrating institutions

Empirically, democratic countries differ strongly with respect to power concentration. In the United Kingdom, for example, virtually all power is enjoyed by the win-

⁹If Assumption 1 is violated and multiple D1 equilibria exist, we can nevertheless study the effects of institutional variations. Then, these equilibria can be strictly sorted in terms of voter welfare. Our results apply with respect to the welfare-best equilibrium.

ning party in the elections for the House of Commons, while power is considerably more dispersed between several parties and multiple political actors in Switzerland. We will argue that these variations in the institutional setting shape the incentives of political candidates, thereby affecting the performance of political systems in selecting well-suited political candidates for office and ensuring the implementation of welfare-enhancing policies.

6.1 Effects on behavior

With asymmetric information about candidates' abilities and motivations, policy choice is distorted in equilibrium: Some egoistic candidates with ability below the reform cost c propose welfare-reducing reforms, thereby mimicking the behavior of more able candidates in order to increase their electoral prospects. By shaping electoral incentives, political institutions affect the magnitude of these policy distortions. In particular, we find that higher levels of power concentration induce more severe distortions in policy.

Lemma 1. *In every interior equilibrium, increasing power concentration induces the proposal of more inefficient reforms, $\frac{d\alpha^H}{d\rho} < 0$.*

Consider an economy and a level of power concentration ρ for which the equilibrium is interior, i.e., the candidates' equilibrium strategy is given by $\alpha^H > \underline{a}$. In this case, a reforming candidate wins the election whenever he runs against a non-reforming opponent because the voter's expected payoff from a reform is positive. At the initial level of ρ , the expected utility an egoistic candidate with ability α^H receives from proposing a reform equals the expected utility from proposing the status quo:

$$E[\pi_i(w, \rho) | x_i = 1] (\theta^H + \alpha^H - c) = E[\pi_i(w, \rho) | x_i = 0] \theta^H > 0.$$

Higher power concentration ρ induces an increase in the expected power of reforming candidates, which reinforces the attractiveness of reform proposals. Correspondingly, the expected power of non-reforming candidates is reduced, which makes status quo proposals less attractive. Hence, if power concentration increases, an egoistic candidate with ability at the initial cutoff ceases to be indifferent between both actions and prefers the reform proposal strictly. It follows that the equilibrium cutoff shifts downwards. In other words, higher concentration of power leads to stronger distortions in policy choice because it strengthens electoral incentives. Figure 1 illustrates this relationship.

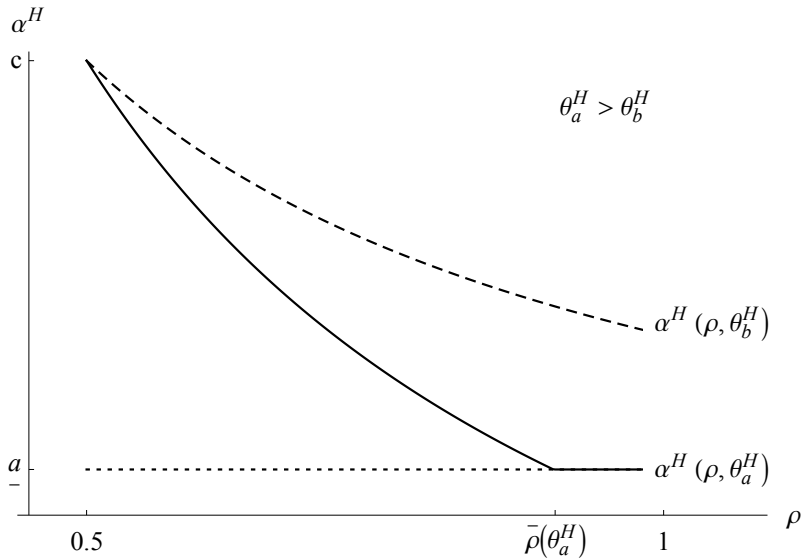


Figure 1: The effect of power concentration on candidate behavior. *Parameters: uniform ability distribution, $c=0.6$, $\mu=0.8$, $\theta_a^H=1$, $\theta_b^H=0.6$.*

The strength of electoral incentives also determines whether an interior equilibrium or a boundary equilibrium arises.

Proposition 6. *The unique equilibrium is interior for all levels of power concentration if the conflict of interest is small, i.e., if $\theta^H < \underline{\theta}(\mu)$ with $\underline{\theta}'(\mu) < 0$. Otherwise, it is interior if and only if power concentration is below some threshold $\bar{\rho}(\theta^H, \mu) \in (\frac{1}{2}, 1]$.*

For strongly dispersed political power (ρ close to $\frac{1}{2}$), election winner and loser enjoy similar levels of political power. In this case, low-ability candidates would hardly gain office rents by proposing an inefficient reform, but would incur a considerable loss in legacy payoff. Consequently, the equilibrium is interior with a cutoff close to its efficient level c .

Increasing power concentration leads to a decrease in cutoff α^H . Consequently, the expected reform payoff to the voter is reduced. If the conflict of interest is sufficiently weak, $\theta^H < \underline{\theta}(\mu)$, the reduction in cutoff α^H is small enough so that it remains above its lower bound a for all levels of ρ . This implies that interior equilibria result even under complete concentration of power (see the dashed line in Figure 1).

If the conflict of interest is instead sufficiently strong, $\theta^H \geq \underline{\theta}(\mu)$, increasing power concentration has a stronger effect on the cutoff α^H . In this case, increasing power concentration makes egoistic candidates so eager to win the election that, eventually, even an egoistic candidate with ability a proposes a reform. Hence, all levels of ρ above some threshold $\bar{\rho}$ lead to a boundary equilibrium, in which the

cutoff α^H is at its natural lower bound \underline{a} and reforms no longer yield a positive payoff to the voter. In this case, further increases in power concentration only affect the voter's behavior (see the solid line in Figure 1).

In the following sections, we focus on the effects of power concentration in interior equilibria. As argued above, institutional changes affect candidate behavior and, consequently, voter information only in these cases.¹⁰

6.2 Effects on political selection

Political selection is impeded if the voter is unable to distinguish between public-spirited highly competent candidates and egoistic low-ability candidates that mimic the former. The previous section clarified that higher concentration of power induces more mimicking and reduces the quality of information provided to the voter. Intuitively, this hampers the voter's ability to pick the right candidate.

We evaluate the quality of political selection by means of the election winner's characteristics in equilibrium. This involves different aspects. The common usage of the term political selection refers to whether the *best candidate* is chosen. Hence, we study the effect of power concentration on the winner's expected motivation and his expected ability. In a slightly broader interpretation, the quality of political selection also depends on whether the *candidate adopting the best policy* is chosen. Hence, we additionally consider the impact on the expected payoff from the winner's policy. We find that power concentration has similar but not identical effects on these aspects.

Proposition 7. *In interior equilibria, an increase in power concentration has the following effects on the quality of political selection:*

- (1) *The probability of a public-spirited election winner strictly falls.*
- (2) *The election winner's expected ability strictly rises if and only if ρ is below some threshold $\rho_A(\theta^H, \mu) \in (\frac{1}{2}, 1]$. For $\theta^H \geq \underline{\theta}(\mu)$, $\rho_A(\theta^H, \mu)$ is below $\bar{\rho}(\theta^H, \mu)$.*
- (3) *The expected payoff from the election winner's proposed policy strictly falls.*

To understand Proposition 7, consider an equilibrium with cutoff α^H . We refer to the group of egoistic candidates with ability slightly below this cutoff as the *marginal candidates*. As explained above, an increase in power concentration induces the marginal candidates to propose a reform instead of the status quo. Thereby, they increase their winning probability: These candidates now win the election if running

¹⁰Moreover, boundary equilibria are strictly welfare-dominated by all interior equilibria as will become clear below. Consequently, the set of concentration levels giving rise to interior equilibria always contains the welfare-maximizing institution.

against a non-reforming candidate, and achieve a draw if running against a reforming candidate. Correspondingly, the winning probability of all other candidates is reduced. Intuitively, the expected election winner will be more alike an egoistic agent with cutoff ability α^H , and less alike all other candidates. Hence, the effect of ρ on political selection depends on the quality of the marginal candidates relative to the average candidate with respect to each of the considered characteristics.

With respect to the winner's expected motivation, this comparison is straightforward: Only egoistic candidates change their behavior and increase their winning probability, while the electoral prospects of all public-spirited candidates are attenuated. Hence, higher power concentration unambiguously reduces the probability of a public-spirited election winner.

With respect to the winner's expected ability, the effect is more subtle. With increasing power concentration, the equilibrium cutoff α_H subsequently decreases from c to \underline{a} . If power is strongly dispersed, the ability of marginal candidates is close to the reform cost c and above the average ability. If the average ability is below \underline{a} , this remains true for all levels of ρ . In this case, the winner's expected ability is monotonically increasing in power concentration. If the average ability is instead above \underline{a} , the ability of marginal candidates may fall below average ability for high levels of power concentration. In this case, the quality of political selection with respect to ability is increasing in ρ up to some threshold ρ_A , and decreasing in ρ beyond that threshold. We conclude that, in some cases, higher levels of power concentration foster the selection of more able candidates. However, higher expected ability is not necessarily associated with better policy outcomes. In particular, candidates with very low ability propose the status quo yielding a payoff of zero, while some more able candidates propose inefficient reforms with negative expected payoff to the voter.

For this reason, we finally consider how the institutional setting affects the quality of selection with respect to the expected payoff from the winner's policy. Regarding this aspect, power concentration has unambiguously detrimental effects on political selection. First, more power is transferred to marginal candidates. As the cutoff ability α^H is below the reform cost c , marginal candidates provide negative expected reform payoffs. These payoffs are clearly lower than the positive expected payoff that is provided by all other reforming candidates and also lower than the zero payoff provided by non-reforming candidates. Second, the marginal candidates switch from the status quo policy with zero payoff to a reform with negative expected payoff to the voter. Thus, an increase in power concentration strictly reduces the expected voter payoff from the winner's policy.

Overall, power concentration does not always impede the voter's ability to select more able candidates, but it unambiguously deteriorates selection with respect to motivation and expected policy payoff.

6.3 Effects on welfare

Finally, we assess the overall performance of power-concentrating institutions by studying their effects on voter welfare. As power concentration does not only affect political selection, i.e., the election winner's characteristics, but also the winner's influence on the implemented policy, variations in power concentration have two opposing effects on welfare in interior equilibria.

On the one hand, the previous section demonstrated that an increase in power concentration leads to a negative *selection effect*, because it impedes the voter's ability to select the candidate choosing the best policy. On the other hand, there is a positive *empowerment effect* of power concentration. The voter rationally opts for the candidate who provides in expectation higher welfare. Thus, an increase in power concentration ρ assigns more power to the better-suited candidate.

Overall, an increase in power concentration involves a non-trivial tradeoff between the positive *empowerment effect* and the negative *selection effect*. To study this tradeoff, we impose the following regularity condition on the weighted ability distribution.

Assumption 2. *The weighted ability distribution $K(a) = (1 - \mu)\Phi(c) + \mu\Phi(a)$ is log-concave in a .*

Log-concavity is a property that is satisfied for most commonly used probability distributions, including the uniform distribution, the normal distribution, the Pareto distribution, and many others. It implies that the weighted ability distribution has a non-decreasing (reversed) hazard rate $K(a)/k(a)$.¹¹

Proposition 8. *Under Assumption 2, voter welfare has a unique maximum in ρ . Limiting the concentration of political power is optimal if and only if the conflict of interest is sufficiently large, i.e., if θ^H exceeds a threshold $\tilde{\theta}(\mu) < \underline{\theta}(\mu)$ with $\tilde{\theta}(\mu)' < 0$. In this case, the optimal level of power concentration is strictly decreasing both in θ^H and μ .*

¹¹Note that log-concavity is usually imposed on the unweighted ability distribution $\Phi(a)$. We slightly generalize this regularity assumption by assuming it also holds for the weighted ability distribution. For the uniform distribution and any distribution with decreasing density ϕ , Assumption 2 follows from log-concavity of Φ .

By Proposition 8, there is a unique optimal level of power concentration $\rho^*(\theta^H, \mu)$, which depends monotonically on the conflict of interest between voter and candidates as characterized by the parameters θ^H and μ . If the conflict of interest is small, candidate behavior is close to efficient so that the voter is able to take a well-informed electoral choice. Hence, the positive effect of giving additional resources to the winner is large enough to outweigh the negative selection effect, and a high concentration of power as in the United Kingdom is optimal. The larger the conflict of interest, the more distorted is policy choice, and the more poorly informed is the voter. Hence, it becomes increasingly important to improve the quality of political selection by means of limiting power concentration as, e.g., in Switzerland or Belgium. Our analysis implies that optimal constitutional design should always be based on a thorough assessment of a country's political culture, e.g., represented in our model by the conflict of interest between voter and candidates. The argument leading to this result involves two main steps.

First, the voter is strictly better off in interior equilibria than in boundary equilibria. Welfare is strictly positive in interior equilibria where reforms provide in expectation higher payoff than the status quo. In boundary equilibria, expected welfare is instead zero as policy choice is sufficiently distorted to equalize the expected payoffs from reforms and the status quo. In the case with high conflict of interest, $\theta^H > \underline{\theta}(\mu)$, the optimal level of power concentration is hence located below the threshold $\bar{\rho}(\theta^H, \mu)$, so to ensure an interior equilibrium (see Proposition 6).

Second, for the range of interior equilibria, the welfare function is strictly quasi-concave in ρ . We derive this result by analyzing how the empowerment effect and the selection effect evolve with power concentration.

Start by considering the positive empowerment effect. With increasing ρ , reforming candidates receive in expectation more power and are entitled to implement larger shares of their proposals. The size of the empowerment effect depends on the expected reform payoff, which determines how much welfare is increased by the reallocation of power. At higher levels of ρ , the expected reform payoff is lower because egoistic candidates propose more inefficient reforms. Consequently, the empowerment effect is strictly decreasing in ρ (see the solid line in Figure 2).

Next, consider the negative selection effect. It results because increasing power concentration induces more egoistic candidates to propose inefficient reforms, which impedes the voter's ability to select the better-suited candidate. The size of the selection effect depends on, first, how strongly the voter's ability is reduced, and second, how strongly voter welfare depends on selecting the better-suited candidate.

Both factors are affected differently by variations in ρ . The first factor, the

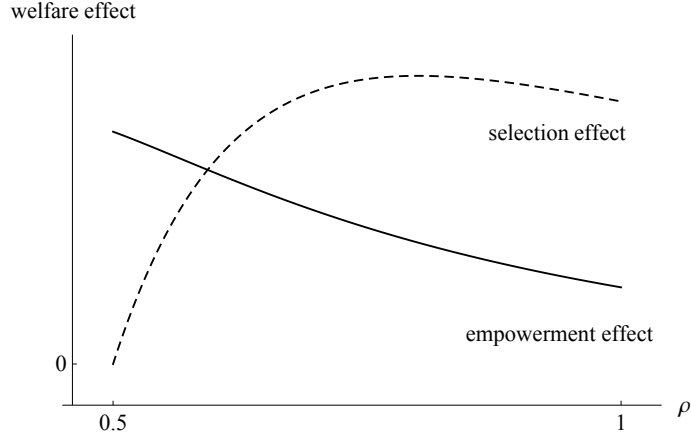


Figure 2: The welfare effects of a change in ρ . The solid line represents the (positive) empowerment effect, the dashed line represents the (negative) selection effect. The optimal level of ρ is attained at the intersection of both lines. Parameters: uniform ability distribution, $c=0.6$, $\mu=0.8$, $\theta^H=0.6$.

change in the ability to choose the better-suited candidate, is decreasing in ρ . It corresponds to the sensitivity of cutoff α^H in ρ . At higher levels of power concentration, marginal candidates have lower ability and face higher legacy losses when proposing a reform. This makes marginal candidates more reluctant to change their proposals as a response to a further increase in ρ . In other words, the sensitivity of cutoff α^H decreases in ρ . The second factor, the importance of selecting better-suited candidates, increases in ρ . At higher ρ , more inefficient reforms are proposed, and the welfare loss induced by marginal candidates is higher due to the lower cutoff α^H . Furthermore, higher power concentration implies a larger difference in the power shares of election winners and losers. As a result, the selection effect is in general not monotonic in ρ (see the dashed line in Figure 2).

For small levels of power concentration, however, the selection effect is negligible. As election winners and losers receive almost the same political power anyway, it does not matter whether the voter selects the better-suited candidate. Consequently, the negative selection effect is dominated by the positive empowerment effect, and welfare is increasing in power concentration. With increasing ρ , the selection effect is subsequently increasing relative to the empowerment effect for the class of log-concave ability distributions. Under Assumption 2, hence, the welfare function has no interior minimum and at most one interior maximum, i.e., it is strictly quasi-concave in ρ .

Regarding the level of ρ^* , we have to distinguish two cases. First, consider the case of a small conflict of interest, $\theta^H \leq \tilde{\theta}(\mu)$. In this case, mimicking is not prevalent and the average reform payoff is large even with concentrated power. Thus, the positive empowerment effect is sufficiently large to dominate the negative selection

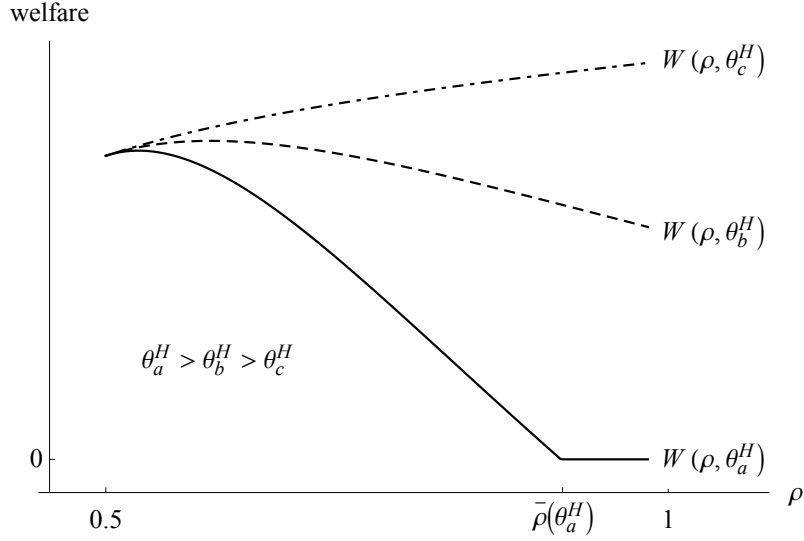


Figure 3: The effect of power concentration on welfare. *Parameters: uniform ability distribution, $c=0.6$, $\mu=0.8$, $\theta_a^H=1$, $\theta_b^H=0.6$, $\theta_c^H=0.3$.*

effect for all levels of ρ , and welfare is maximized by full concentration of power. This case is depicted by the dot-dashed welfare function in Figure 3.

Second, consider the case of a strong conflict of interest, $\theta^H > \tilde{\theta}(\mu)$. In this case, power concentration induces widespread mimicking and a small average reform payoff, so that the empowerment effect is small. In contrast, the selection effect is large: As α^H is small and the induced welfare loss from marginal candidates is high, it is particularly important to select the right candidate. This implies that the negative selection effect dominates if power concentration exceeds some interior level ρ^* , that represents the optimal level of power concentration. In this case, welfare is maximized by institutions that limit the power of the election winner. This case is depicted by the dashed and the solid welfare functions in Figure 3.

Finally, Proposition 8 clarifies that the optimal constitution involves less concentration of power whenever the conflict of interest between the voter and the candidates is reinforced. In our two-dimensional setting, this reinforcement can either result because egoistic candidates have a stronger office motive (higher θ^H), or because there are more egoistic candidates (higher μ). Intuitively, a stronger office motive makes mimicking more attractive and induces more inefficient reforms by egoistic candidates. Similarly, a larger share of egoistic types aggravates the distortions in policy choice, and impedes the voter's ability to select well-suited candidates. In both cases, the stronger distortions in policy proposals reduce the positive empowerment effect and increase the negative selection effect of power concentration. Thus, it becomes more beneficial and less costly to reduce these distortions by means of

power-dispersing institutions.¹²

7 Extension: Heterogeneous voters

In the previous chapter, we have considered a stylized electoral setting with a representative voter. This allowed us to delineate the effects of power concentration on the quality of information provided through electoral campaigns. Clearly, this approach leaves aside the crucial role of public elections to aggregate preferences in heterogeneous electorates. The results of the previous sections extend, however, to the case with preference heterogeneity among voters. In the following, we provide a verbal summary of our results for an extended model. All formal proofs are available upon request.

Let there be a continuum of voters with heterogeneous policy preferences. If a full-scale reform is successfully adopted, the return to voter k is equal to some individual preference parameter β_k . We assume that parameter β_k is symmetrically distributed on some compact interval. Aside this heterogeneity, all voters are equal: They bear the same cost c of reform implementation, and receive a zero payoff if the status quo is adopted. As normative criterion, we use an unweighted utilitarian welfare function, i.e., average voter utility. The election winner is determined by simple majority rule. With sincere voting, every election is consequently won by the median voter's preferred candidate.

As the median voter's behavior does not qualitatively differ from the behavior of a representative voter, voter heterogeneity does not affect the equilibrium behavior of candidates. In consequence, variations in power concentration have the same effects on political selection and voter welfare as in the basic model.

With heterogeneous voters, we can even generalize our results to institutional settings in which the winner's political power depends on the margin of his electoral victory. In the real world, the electoral margin affects political power for formal reasons (e.g., supermajority requirements) as well as informal reasons (e.g., party discipline). We capture this aspect by assuming that the political power of each candidate depends on both his vote share and some parameter of power concen-

¹²While focusing on the optimal concentration of power, our model also relates to a literature that investigates whether democratic selection or political leaders are desirable at all. For example, Maskin & Tirole (2004) find that, under certain circumstances, political decisions should rather be delegated to randomly chosen "judges" than to elected "politicians". In our model, a non-democratic system yields the same welfare as the limiting case of a democratic system with fully dispersed power, and is always dominated by the democratic system with optimally chosen power concentration.

tration.¹³ Our main results carry over to this larger class of institutional settings: First, limiting the concentration of power improves political selection and voter welfare whenever the conflict of interest between voters and candidates is sufficiently large. Second, the optimal level of power concentration monotonically decreases if political selection is further exacerbated by a larger conflict of interest.

Finally, the introduction of heterogeneous voters allows to integrate concerns for the political representation of minorities in our setting. From political philosophers to modern political scientists (see, e.g., Madison 1788*a* in the Federalist # 51, Lijphart 1999), power-dispersing institutions have often been recommended in order to foster the representation of minorities in the society, and to circumvent a tyranny of the majority. To integrate these concerns in our model, we assume that there are two groups of voters. While the majority of voters benefit from a successfully implemented reform, the minority do not benefit from a reform and prefers the status quo. Furthermore, we use as the social planner's objective a weighted welfare function that assigns larger weights to agents from the minority.

If the concern for minorities is sufficiently strong, limiting the concentration of power becomes optimal even in the benchmark case of perfect information. For any degree of minority concerns, however, the optimal level of power concentration is weakly smaller under asymmetric than under perfect information. Conversely, political power should be weakly more dispersed if the normative criterion exhibits concerns for the minority than without such concerns.¹⁴ Intuitively, power dispersion may have beneficial effects through two separate channels. A concern for minorities calls for power dispersion as a means to adapt the implemented policy to the interest of the minority. A selection problem, in contrast, calls for power dispersion to discipline politicians in their reform proposals. Overall, the quality of political selection and the representation of minorities can be regarded as two independent motives for the introduction of power-dispersing political institutions.

¹³Formally, we introduce a continuously differentiable power allocation function $\tilde{\pi}$ that maps the vote share v_i and the power concentration parameter $\tilde{\rho}$ into a power share for each candidate. We assume $\tilde{\pi}$ to be symmetric, i.e., $\tilde{\pi}(v, \rho) = 1 - \tilde{\pi}(1 - v, \rho)$, monotonically increasing in the vote share, and, if and only if $v > \frac{1}{2}$, monotonically increasing in $\tilde{\rho}$.

¹⁴There are cases in which either full concentration or full dispersion of power is optimal both under asymmetric and under perfect information. In all other cases, optimal power concentration is strictly smaller under asymmetric information. The same applies for the comparison of optimal power concentration with and without a concern for the minority.

8 Empirical analysis

Our model makes novel statements about the effect of power concentration on welfare and its interaction with politicians' motivation. According to Proposition 8, the welfare-maximizing level of power concentration is decreasing in the conflict of interest between voters and candidates. For a sufficiently weak conflict of interest, we find that full concentration of power is optimal, implying a positive welfare effect of power concentration. For a stronger conflict of interest, limiting power concentration is optimal, i.e., the model predicts a smaller or even a negative welfare effect of power concentration (see Figure 3). While a rigorous empirical test is beyond the scope of this paper, we briefly look at cross-country data and find support for our model predictions. This section summarizes our empirical approach, while full detail is provided in the appendix.

The analysis requires measurements for the three key variables of our model: power concentration, the conflict of interest between voters and politicians, and welfare. We capture the concentration of political power by *Lijphart's index of the executive-parties dimension*. The index assesses how easily a single party can take complete control of the government and is based on the period 1945-1996. We operationalize the conflict of interest between voters and politicians with data from the *International Social Survey Panel*. In 2004, the panel asked voters to assess the motives of their political representatives. As a proxy for welfare we use growth in real GDP per capita.

The data indicate considerable cross-country differences in how voters perceive the motives of their political representatives. At the same time, countries vary strongly in their concentration of political power. We use this cross-country variation to analyze whether the concentration of political power and the conflict of interest between voters and politicians interact in their effect on the performance of the political system. To this end, we regress economic growth on the concentration of political power, the conflict of interest, the interaction term between the two, and past economic performance. The controls for past economic performance and the structure of the data suggest that any effects identified are not driven by reverse causality. However, data availability and our focus on established democracies restrict the analysis to 18 countries.

The regression results are summarized in Table 1. The regression model in Column (a) does not include an interaction term and hence assumes that any effect of power concentration is independent of the conflict of interest between voters and politicians. In this regression, the coefficient of power concentration is insignificant, i.e., we do not find an unconditional effect of power concentration on growth.

Table 1: OLS regression results

	Growth in real GDP per capita (2005-2013)	
	(a)	(b)
Power concentration	-0.526 (0.642)	4.224** (1.635)
Conflict of interest	-0.196 (1.305)	3.096** (1.235)
Power concentration × Conflict of interest		-9.530** (3.581)
Constant	2.160 (1.588)	0.755 (0.935)
Controls	yes	yes
adjusted R^2	0.13	0.42
N	18	18

Controls: real GDP per capita (2004), growth in real GDP per capita (1991-2004). Power concentration and conflict of interest are normalized to range between 0 and 1. Heteroskedasticity-robust standard errors are provided in parentheses. ***, **, * indicate significance at the 1-, 5-, and 10-percent level, respectively.

This picture changes if the interplay between power concentration and politicians' motivation is taken into account. Column (b) displays the results of a regression model that includes an interaction term between power concentration and the conflict of interest. The coefficient of this interaction term is negative and significant. Thus, the stronger the conflict of interest, the less beneficial is power concentration for growth. Furthermore, the conflict of interest determines the direction of the effect of power concentration: Countries in which the conflict of interest is low seem to benefit from an increase in power concentration, while we observe the opposite for countries in which the conflict of interest is high.¹⁵ We also find that accounting for the interaction between power concentration and the conflict of interest strongly improves the explanatory power of the econometric model, as evidenced by a sharp increase in the adjusted R^2 . These results illustrate the consistency of the data with our model. Due to the small sample size, however, the analysis does not replace a more detailed empirical investigation.

¹⁵For the lowest level of conflict, the effect of power concentration is given by the coefficient of power concentration in Table 1, Column (b) (4.224, $p < 0.05$). For the highest level of conflict, the effect of power concentration is given by the sum of the coefficients of power concentration and the interaction term between power concentration and the conflict of interest (-5.306, $p < 0.05$).

9 Conclusion

In this paper, we have investigated the effects of political institutions on voter welfare and on the voters' capacity to select well-suited politicians. We have shown that concentration of political power has two countervailing effects on welfare. On the one hand, higher levels of power concentration increase electoral stakes and induce more opportunistic campaign behavior by egoistic candidates. The reduced informativeness of political campaigns and the more inefficient policy choice give rise to a negative *selection effect*. On the other hand, higher levels of power concentration allocate more power to the voters' preferred candidate and thereby give rise to a positive *empowerment effect*.

The welfare-maximizing level of power concentration balances both effects. Our analysis demonstrates that this optimal level is decreasing in the conflict of interest between candidates and voters. With a larger conflict of interest, more low-ability candidates mimic the policy choice of high-ability candidates to the detriment of the voter. It is then more beneficial to reduce this inefficiency through a reduction in power concentration. The results extend to a model with heterogeneous voters and more complex political institutions. Moreover, they are in line with cross-country data from a sample of established democracies.

Our analysis uncovers a simple but robust link between the concentration of political power and the quality of political selection. It contributes to the ongoing debate on optimal institutional design by providing novel arguments regarding the quality of political selection. A more general insight of the paper is that no unconditionally optimal institutional setting exists; constitutional design should always be based on a thorough assessment of a country's political culture, including in particular the conflict of interest between voters and candidates.

Our paper highlights promising avenues for future research. Regarding theoretical work, it would be interesting to study the effects of institutions on political selection in a model with repeated elections that reflect the dynamic nature of politics with its (pre-election) campaign stages and (post-election) implementation stages. This would contrast the selection effects of political institutions to both their empowerment effects and their disciplining effects, thereby building a bridge between pre-election models as ours and post-election models as Besley & Smart (2007) or Smart & Sturm (2013). Regarding empirical work, our paper provides only a first, illustrative look at the data. Nevertheless, our findings indicate that future studies should proceed in combining data on political institutions with information on political culture.

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Appendix A: Proofs

Proof of Proposition 1

Under perfect information, the optimal voting strategy of the voter induces the following winning probabilities for candidate 1

$$s(x_1, x_2) = \begin{cases} 1 & \text{if } x_1 (a_1 - c) > x_2 (a_2 - c) \\ \frac{1}{2} & \text{if } x_1 = x_2 \text{ and } x_1 (a_1 - c) = x_2 (a_2 - c) \\ 0 & \text{if } x_1 (a_1 - c) < x_2 (a_2 - c) \end{cases}$$

Candidate 1 chooses x_1 to maximize

$$E_{a_2, \theta_2} [\rho s(x_1, X_2(a_2, \theta_2)) + (1 - \rho)(1 - s(x_1, X_2(a_2, \theta_2)))] [x_1(a_1 - c) + \theta_1].$$

First, consider a candidate with ability $a_1 > c$. He can maximize his winning probability by choosing $x_1 = 1$. Moreover, $x_1 = 1$ is also the unique maximizer of the term $x_1 (a_1 - c)$. Hence, a candidate with ability above c always proposes a full-scale reform. Second, consider a candidate with ability below c . He maximizes his chances to win the election by playing the status quo. In particular, the associated winning probability is always strictly positive. Hence, the status quo proposal also strictly maximizes his legacy payoff, $E[\pi_1] x_1 (a_1 - c)$, implying that candidates with ability below c always play the status quo in equilibrium. For candidate 2, corresponding arguments apply.

The result has direct normative implications. Changes in power concentration ρ neither influence candidate behavior nor the quality of political selection. However, the higher ρ , the higher is the expected power of the winning candidate, i.e., the one providing higher expected utility to the voter. Hence, voter welfare strictly increases with the level of power concentration.

Proof of Proposition 2

The following notation is used in the proofs below. We denote by $\hat{a}_i(x_i)$ the expected ability that the voter associates with candidate i if he proposes policy x_i . In equilibrium, $\hat{a}_i(x_i) = \mathbb{E}[a_i | X_i(a_i, \theta_i) = x_i]$. The optimal voting strategy of the voter induces the following winning probability for candidate 1

$$s(x_1, x_2) = \begin{cases} 1 & \text{if } x_1 (\hat{a}_1(x_1) - c) > x_2 (\hat{a}_2(x_2) - c) \\ \frac{1}{2} & \text{if } x_1 = x_2 \text{ and } x_1 (\hat{a}_1(x_1) - c) = x_2 (\hat{a}_2(x_2) - c) \\ 0 & \text{if } x_1 (\hat{a}_1(x_1) - c) < x_2 (\hat{a}_2(x_2) - c) \end{cases}$$

Denote by $\hat{\pi}_1(x_1) = \mathbb{E}_{a_2, \theta_2} [\rho s(x_1, X_2(a_2, \theta_2)) + (1 - \rho)(1 - s(x_1, X_2(a_2, \theta_2)))]$ the expected power share that candidate 1 gains by proposing x_1 , given his opponent's strategy X_2 (for reasons of readability, X_2 is not explicitly included as argument of $\hat{\pi}_1$). The expected power share $\hat{\pi}_2(x_2)$ is defined correspondingly.

The proof involves four steps. First, we show that the status quo is always proposed in equilibrium. Second, the equilibrium reform proposals of candidates are ordered in the sense that candidates with higher ability play proposals with higher x_i $\hat{\pi}_i(x_i)$. Third, we argue that the preceding two properties together imply that each candidate actually proposes at most one positive reform amount $x_i > 0$. Fourth, using the uniqueness of the reform amount, each candidate's strategy can be characterized by two cutoffs α^L and α^H such that candidates with ability lower than their corresponding cutoff play the status quo and those with ability above the cutoff play the unique positive reform amount.

For the first step, we show that $X_i^*(a_i, \theta_i) = 0$ is true for some type (a_i, θ_i) with strictly positive probability in equilibrium. Assume the contrary, i.e., $X_i^*(a_i, \theta_i) > 0$ for all a_i and θ_i . Because the expected ability is below c , there must be some equilibrium action $x' > 0$ such that $\hat{a}_i(x') < c$. Because this implies a negative expected payoff $x'(\hat{a}_i(x') - c)$, it follows that the voter prefers a candidate that proposes the status quo to a candidate that proposes x' . Hence, the expected power is larger when proposing the status quo than in the case of x' , $\hat{\pi}_i(0) \geq \hat{\pi}_i(x')$.

By the same argument, the opponent also either proposes the status quo or plays some equilibrium action $x'' > 0$ with $x''(\hat{a}_{-i}(x'') - c) < 0$ along the equilibrium path. When i faces an opponent that plays either one of these actions he gains at least half of the votes by choosing $x_i = 0$. Hence, $\hat{\pi}(0) > 0$. As a consequence, candidate i is strictly better off with the status quo proposal than with x' if he has ability $a_i < c$:

$$\hat{\pi}_i(0) \theta_i > \hat{\pi}_i(x') [\theta_i + x' (a_i - c)].$$

Thus, x' can at most be proposed by candidates with ability $a_i \geq c$, which contradicts $\hat{a}_i(x') < c$. We conclude that the status quo is played in equilibrium by both candidates for some (a_i, θ_i) .

Second, candidates' proposals are ordered such that candidates with higher ability (but the same motivation) play proposals with higher associated x_i $\hat{\pi}_i(x_i)$. Denote by X^* the set of equilibrium actions. Consider two different actions $x' \in X^*$ and $x'' \in X^*$. Candidate i prefers playing x'' to x' if and only if

$$\begin{aligned} \hat{\pi}_i(x'') [x''(a_i - c) + \theta_i] &\geq \hat{\pi}_i(x') [x'(a_i - c) + \theta_i] \\ \Leftrightarrow [\hat{\pi}_i(x'')x'' - \hat{\pi}_i(x')x'] (a_i - c) &\geq [\hat{\pi}_i(x') - \hat{\pi}_i(x'')] \theta_i. \end{aligned} \quad (8)$$

For $\hat{\pi}_i(x'')x'' = \hat{\pi}_i(x')x'$, $x'' \neq x'$ implies $\hat{\pi}_i(x'') \neq \hat{\pi}_i(x')$. Hence, all types strictly prefer the same action, which contradicts the assumption that both are elements of X^* . Thus,

$\hat{\pi}_i(x'')x'' \neq \hat{\pi}_i(x')x'$ must hold. Without loss of generality, let $\hat{\pi}_i(x'')x'' > \hat{\pi}_i(x')x'$. Since the left-hand side of (8) is monotonic in a_i , there is a unique cutoff $\alpha_i^J(x', x'')$ such that i with $\theta_i = \theta^J$ strictly prefers x'' if $a_i > \alpha_i^J(x', x'')$, and x' if $a_i < \alpha_i^J(x', x'')$.

Third, we show that each candidate proposes at most one positive reform $x_i > 0$. This part of the proof needs three substeps. First, we show that egoistic and public-spirited candidates with ability c play the same action. Second, we show that all candidates with ability below c either play the status quo or the action played by candidates with ability c . Third, we show that candidate i plays the same action for all abilities $a_i \geq c$.

For the first substep, denote by x_c^L an action played by i for type (c, θ^L) with positive probability. This action has two properties. First, it must be the unique maximizer of the power share $\hat{\pi}_i$ in X^* . Second, it must also be played by some types with higher ability, and thus be associated with a belief $\hat{a}_i(x_c^L)$ above c . For the first property, note that i only cares about the winning probability if he has ability c . If there were multiple maximizers of $\hat{\pi}_i$ in X^* , candidate i would strictly prefer the higher action for $a_i > c$, and the lower action for $a_i < c$. But then, both actions cannot simultaneously provide the same winning probability and be maximizers of $\hat{\pi}_i(x_i)$. As x_c^L is the unique maximizer of $\hat{\pi}_i(x_i)$, it is also strictly preferred to all other actions by a candidate with type (c, θ^H) . For the second property, if x_c^L would not be associated with some belief above c , the cutoff property implied that at least one other action would only be played by candidates above c and associated with a strictly higher expected payoff. Hence, x_c^L could not be the maximizer of $\hat{\pi}_i(x_i)$.

For the second substep, let $a_i < c$. If candidate i plays an action $x' \neq x_c^L$ for $a_i < c$, then the cutoff property implies $\hat{a}_i(x') < c$. For $x' \neq 0$, this would mean $\hat{\pi}_i(x') < \hat{\pi}(0)$, and x' would yield lower utility to candidate i than the status quo. Hence, i plays either x_c^L or 0 for any $a_i < c$. More precisely, i prefers x_c^L to 0 if and only if

$$x_c^L \hat{\pi}(x_c^L) (a_i - c) > [\hat{\pi}(0) - \hat{\pi}(x_c^L)] \theta_i.$$

It follows that there are two cutoffs α_{i0}^L and $\alpha_{i0}^H < \alpha_{i0}^L$ such that, for $\theta_i = \theta^J$, candidate i strictly prefers x_c^L if $a_i \in (\alpha_{i0}^J, c)$, and 0 if $a_i < \alpha_{i0}^J$.

For the third substep, consider the behavior by candidate i for abilities above c . Denote by x_1^L an action played by type $(1, \theta^L)$ with positive probability. If $x_1^L = x_c^L$, the cutoff property implies that public-spirited candidates play x_c^L , the action maximizing the winning probability, for all $a_i \geq c$. Moreover, if public-spirited types prefer x_c^L to all other proposals in $[0, 1]$ for all $a_i > c$, then the same is true for egoistic types (see inequality 8). In this case, we can conclude that only one positive reform amount and the status quo are played by candidate i in equilibrium.

Assume in contrast that $x_1^L \neq x_c^L$. By the ordering of actions, this can only be the case if $x_1^L \hat{\pi}_i(x_1^L) > x_c^L \hat{\pi}_i(x_c^L)$, although x_1^L yields a lower winning probability than x_c^L . This would only be possible if the belief $\hat{a}_i(x_c^L)$ exceeded the belief $\hat{a}_i(x_1^L)$. In the following, we

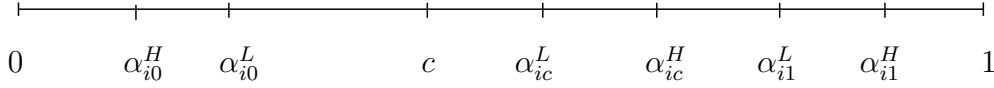


Figure 4: Necessary ordering of cutoffs if $x_L^c \neq x_L^1$ were true (third substep).

prove by contradiction that this is inconsistent with the required ordering of cutoffs.

Using again (8), there exist two cutoffs $\alpha_{i1}^L \in (c, 1]$ and $\alpha_{i1}^H > \alpha_{i1}^L$ such that candidate i prefers action x_1^L to all other actions in X if and only if $\theta_i = \theta^J$ and $a_i > \alpha_{i1}^J$. Similarly, there exist two smaller cutoffs $\alpha_{ic}^L \in (c, \alpha_{i1}^L]$ and $\alpha_{ic}^H \in (c, \alpha_{ic}^L]$ such that i prefers action x_c^L to all other positive actions $x > 0$ if and only if $\theta_i = \theta^J$ and $a_i < \alpha_{ic}^J$. Note that $\alpha_{ic}^L < \alpha_{ic}^H$. Figure 4 depicts this ordering of cutoffs that necessarily follows for $x_L^c \neq x_L^1$. It implies that $\hat{a}_i(x_1^L) > E[a_i | \alpha_{i1}^L \leq a_i \leq \alpha_{i1}^H]$ and $\hat{a}_i(x_c^L) < E[a_i | \alpha_{ic}^L \leq a_i \leq \alpha_{ic}^H]$. As $\alpha_{i1}^L \geq \alpha_{ic}^L$ and $\alpha_{i1}^H \geq \alpha_{ic}^H$, it is impossible that the condition $\hat{a}_i(x_1^L) < \hat{a}_i(x_c^L)$ is satisfied. We conclude x_1^L cannot differ from x_c^L , and that candidate i plays action x_c^L for all $a_i > c$.

Finally, the previous steps imply that there is a unique pair of cutoffs $\alpha_i^L = \alpha_{i0}^L < c$ and $\alpha_i^H = \alpha_{i0}^H < \alpha_i^L$ such that $X_i^*(a_i, \theta_i) = 0$ if $\theta_i = \theta^J$ and $a_i < \alpha_i^J$, and $X_i^*(a_i, \theta^L) = x_c^L$ otherwise, where x_c^L equals the equilibrium proposal b in Proposition 2.

Proof of Proposition 3

Non-robustness of $(0, b)$ equilibria with $b < 1$

The D1 criterion introduced by Cho & Kreps (1987) refines the equilibrium concept by restricting off-equilibrium beliefs. It requires that each deviation from equilibrium strategies must be associated to the set of types that would benefit from this deviation for the largest set of beliefs. More formally, a deviation to some action cannot be associated to a type t if there is some other type t' such that the deviation would be profitable for an agent with type t' , first, for all beliefs such that the deviation would be profitable for type t , and second, for some beliefs such that the deviation would not be profitable for type t .

Generally, the set of D1 equilibria is a subset of the set of Perfect Bayesian equilibria. In our model, this criterion eliminates all equilibria in which $X_i^*(1, \theta_i)$ is unequal to 1. Consider some equilibrium with $b_i < 1$. We first identify the set of beliefs for the off-equilibrium action $x_i = 1$ that is consistent with the D1 criterion. For a candidate with ability such that $a_i + \theta_i \leq c$, the status quo is more attractive than the full reform for every belief $\hat{\pi}_i(1)$. Moreover, for an agent with type (a_i, θ_i) and $a_i + \theta_i > c$, a deviation to $x_i = 1$ would be profitable for any belief such that

$$\begin{aligned} \hat{\pi}_i(1) [\theta_i + a_i - c] &\geq \hat{\pi}_i(X_i^*(a_i, \theta_i)) [\theta_i + X_i^*(a_i, \theta_i)(a_i - c)] \\ \Leftrightarrow \hat{\pi}_i(1) &\geq \hat{\pi}_i(X_i^*(a_i, \theta_i)) \frac{\theta_i + X_i^*(a_i, \theta_i)(a_i - c)}{\theta_i + a_i - c}. \end{aligned}$$

Given any equilibrium strategy $X_i^*(a_i, \theta_i)$, the right-hand side is strictly decreasing in a_i . Thus, the set of beliefs giving rise to a profitable deviation for any type (a_i, θ_i) with $a_i < 1$ is a strict subset of the corresponding set for type $(1, \theta_i)$. According to the D1 criterion, the voter must hence believe to face a candidate with $a_i = 1$ and vote accordingly if he observes the off-equilibrium action $x_i = 1$. Given this belief, however, $1(\hat{a}_i(1) - c) > b_i(\hat{a}_i(b_i) - c)$ implies $\hat{\pi}_i(1) > \hat{\pi}_i(b)$. Consequently, deviating to a full reform is strictly profitable for high-ability candidates. Thus, no equilibrium with $b_i < 1$ is robust to the D1 criterion.

Robustness of $(0, 1)$ equilibria

Second, all PBE equilibria with $b_1 = b_2 = 1$ are robust to D1. Consider a deviation to any $b'_i \in (0, 1)$. For candidate i with office motivation θ^J and $a_i < \alpha_i^J$, this deviation is profitable if and only if

$$\hat{\pi}_i(b'_i) [\theta^J + b'_i(a_i - c)] > \hat{\pi}_i(0)\theta^J.$$

As the left-hand side is strictly increasing in a_i , the set of beliefs such that the deviation is profitable is “largest” for the cutoff type $a_i = \alpha_i^J < c$. For agents with $a_i \geq \alpha_i^J$, $\theta^J + b'_i(a_i - c) > 0$ holds and the deviation is profitable if

$$\hat{\pi}_i(b'_i) > \hat{\pi}_i(1) \frac{\theta^J + a_i - c}{\theta^J + b'_i(a_i - c)}.$$

As the right-hand side is strictly increasing in a_i , the deviation can again only be attributed to the cutoff type $a_i = \alpha_i^J$. As both cutoffs α_i^L and α_i^H are located below c , we have $\hat{a}_i(b'_i) < c$, which induces $\hat{\pi}_i(b'_i) < \hat{\pi}_i(0)$. Hence, this deviation is never profitable for candidate i .

Existence of symmetric D1 equilibria

In the following, we show that symmetric D1 equilibria exist. In such an equilibrium, each candidate proposes a full reform if $\theta_i = \theta^J$ and $a_i \geq \alpha_i^J = \alpha^J$, and the status quo otherwise. Thus, we need to show that two cutoffs α^L and α^H exist such that these strategies are indeed mutually best responses.

Note that there are only four possible equilibrium pairs of actions. If both candidates propose the same policy, the winning probability and expected power share of each candidate is equal to one half. If only candidate 1 proposes a reform, $x_1 = 1$, his winning probability is given by $s_{10} = s(1, 0)$ and his expected power share by $s_{10}\rho + (1 - s_{10})(1 - \rho)$.

The proof makes use of three auxiliary functions. First, define the pair of functions

$$R_{iJ}(\alpha^J, \alpha^L, \alpha^H, s_{10}, \rho) = \left[\frac{1}{2} + \bar{K}(\alpha^L, \alpha^H) \left[s_{10}\rho + [1 - s_{10}](1 - \rho) - \frac{1}{2} \right] \right] (\alpha^J - c)$$

$$+ \theta^J \left[s_{10}\rho + [1 - s_{10}] (1 - \rho) - \frac{1}{2} \right],$$

where $\bar{K}(x, y) = \mu\Phi(x) + (1-\mu)\Phi(y)$. An equilibrium is given by each vector $(\alpha^L, \alpha^H, s(1, 0))$ that satisfies (a) $R_L(\alpha^L, \alpha^L, \alpha^H, s_{10}, \rho) = 0$, (b) $R_H(\alpha^H, \alpha^L, \alpha^H, s_{10}, \rho) = 0$, and (c) $s_{10} = 1$ if $\hat{a}(1) > c$, and $s_{10} = 0$ if $\hat{a}(1) < c$. Verbally, (a) and (b) ensure that candidates are indifferent between a full reform and the status quo if their type equals (α^J, θ^J) for $J \in \{L, H\}$. In other words, egoistic and public-spirited candidates are willing to play the corresponding cutoff strategies. Condition (c) ensures optimal voter behavior.

Second, define the function $q(\alpha) = (\alpha - c) \frac{\theta^L}{\theta^H} + c$, which is strictly increasing in α . The function $R_L(q(\alpha^H), q(\alpha^H), \alpha^H, s_{10}, \rho)$ attains zero at some level α^H if and only if the same is true for function $R_H(\alpha^H, q(\alpha^H), \alpha^H, s_{10}, \rho)$. Note also that both functions are continuous in α^H . Hence, if $\alpha^L = q(\alpha^H)$, then (a) is satisfied if and only if (b) is satisfied.

Third, define the lower bound a_c that solves

$$\frac{\mu \int_{a_c}^1 ad\Phi(a) + (1 - \mu) \int_{q(a_c)}^1 ad\Phi(a)}{1 - \bar{K}(a_c, q(a_c))} = c,$$

a_c is well defined since the left hand side of this equation is monotonically and continuously decreasing in a_c , and larger c for $a_c = c$ as well as smaller c for $a_c = 0$. If candidate behavior is given by $\alpha^L = q(\alpha^H)$ and α^H greater, equal, or smaller than a_c , the associated belief $\hat{a}(1)$ is higher, equal, or smaller than c , respectively. Thus, optimal voting behavior is given by $s_{10} = 1$ for $\alpha^H > a_c$ and $s_{10} = 0$ for $\alpha^H < a_c$.

Using these definitions, in the following we prove the existence of at least one symmetric equilibrium, which can be either interior or boundary. If $R_H(a_c, q(a_c), a_c, 1, \rho) < 0$, at least one interior equilibrium with $\alpha^H > a_c$ and $s_{10} = 1$ exists. Note that $q(c) = c$ and that $R_H(c, q(c), c, 1, \rho) > 0$ for ρ . The continuity of functions R_H and R_L , and the construction of function q ensure the existence of at least one pair $\alpha^L = q(\alpha^H)$ with $\alpha^H > a_c$ such that all equilibrium conditions are satisfied for $s_{10} = 1$.

If instead $R_H(a_c, q(a_c), a_c, 1, \rho) \geq 0$, there exists a boundary equilibrium with $\alpha^L = q(a_c)$, $\alpha^H = a_c$ and some value $s_{10} \in (\frac{1}{2}, 1]$. Given that the candidates' symmetric strategy is given by $\alpha^H = a_c, \alpha^L = q(a_c)$, the voter expects the same payoff from reforming candidates and status quo proposing candidates. Hence, every voting behavior $s_{10} \in [0, 1]$ is incentive-compatible. In particular, this includes a unique number in $(\frac{1}{2}, 1]$ such that both candidates are indeed willing to play the strategy characterized by the cutoffs $\alpha^L = q(a_c)$ and $\alpha^H = a_c$.

Proof of Proposition 4

First, we derive the optimal behavior of public spirited candidates. Then, we show by contradiction that no asymmetric equilibria exist. Finally, we characterize the possible types of equilibria, interior and boundary.

Behavior of benevolent candidates

If candidate 1 is public-spirited, the corresponding cutoff α_1^L solves the equation:

$$\begin{aligned} & \left[\frac{1}{2} + \bar{K}(\alpha_2^L, \alpha_2^H) \left[s_{10}\rho + (1 - s_{10})(1 - \rho) - \frac{1}{2} \right] \right] (\alpha_1^L - c) \\ & + \theta^L \left[s_{10}\rho + [1 - s_{10}](1 - \rho) - \frac{1}{2} \right] = 0. \end{aligned}$$

For $\theta^L \rightarrow 0$, the cutoff α_1^L converges to c . The same is true for cutoff α_2^L . Thus, the probability that candidate i proposes a reform is given by

$$K(\alpha_i^H) = \bar{K}(\alpha_i^H, c) = \mu(1 - \Phi(\alpha_i^H)) + (1 - \mu)(1 - \Phi(c)).$$

Symmetry of cutoffs

To simplify notation, we define the conditional power shares of candidate 1:

$$\begin{aligned} \pi_{10} &= \rho s(1, 0) + (1 - \rho)(1 - s(1, 0)) \\ \pi_{01} &= \rho s(0, 1) + (1 - \rho)(1 - s(0, 1)) \\ \pi_{11} &= \rho s(1, 1) + (1 - \rho)(1 - s(1, 1)) \end{aligned}$$

For candidate 1, proposing the status quo gives an expected utility of

$$\left\{ K(\alpha_2^H) \frac{1}{2} + [1 - K(\alpha_2^H)] \pi_{01} \right\} \theta^H,$$

while the reform proposal $x_1 = 1$ gives an expected utility of

$$\left\{ K(\alpha_2^H) \pi_{10} + [1 - K(\alpha_2^H)] \pi_{11} \right\} [\theta^H + a_1 - c].$$

We show by contradiction that there cannot be an asymmetric equilibrium in which both candidates play strategies with different egoistic-type cutoffs $\alpha_1^H \neq \alpha_2^H$. Assume there were such an equilibrium. Necessarily candidate 1 is then indifferent between proposing the status quo and the reform if he has type (α_1^H, θ^H) , i.e., the following equation holds

$$\frac{\theta^H}{c - \alpha_1^H} \left[K(\alpha_2^H) \left(\pi_{10} - \frac{1}{2} \right) + (1 - K(\alpha_2^H)) (\pi_{11} - \pi_{01}) \right] = \pi_{11} + K(\alpha_2^H) (\pi_{10} - \pi_{11}).$$

Correspondingly, candidate 2 must be indifferent between both actions for type (α_2^H, θ^H) :

$$\frac{\theta^H}{c - \alpha_2^H} \left[K(\alpha_1^H) \left(\frac{1}{2} - \pi_{01} \right) + (1 - K(\alpha_1^H)) (\pi_{10} - \pi_{11}) \right] = 1 - \pi_{11} + K(\alpha_1^H) (\pi_{11} - \pi_{01}).$$

Subtracting these indifference conditions from each other, we get the necessary equi-

librium condition

$$\begin{aligned}
& \frac{\theta^H}{c - \alpha_1^H} \left[K(\alpha_2^H) \left(\pi_{10} - \frac{1}{2} \right) + (1 - K(\alpha_2^H)) (\pi_{11} - \pi_{01}) \right] \\
& - \frac{\theta^H}{c - \alpha_2^H} \left[K(\alpha_1^H) \left(\frac{1}{2} - \pi_{01} \right) + (1 - K(\alpha_1^H)) (\pi_{10} - \pi_{11}) \right] = \\
& K(\alpha_2^H) \pi_{10} + [1 - K(\alpha_2^H)] \pi_{11} - 1 + K(\alpha_1^H) \pi_{01} + [1 - K(\alpha_1^H)] \pi_{11} \\
& \Leftrightarrow \left[\frac{\theta^H K(\alpha_2^H)}{c - \alpha_1^H} - \frac{\theta^H (1 - K(\alpha_1^H))}{c - \alpha_2^H} - K(\alpha_2^H) \right] \left(\pi_{10} - \frac{1}{2} \right) \\
& - \left[\frac{\theta^H K(\alpha_1^H)}{c - \alpha_2^H} - \frac{\theta^H (1 - K(\alpha_2^H))}{c - \alpha_1^H} - K(\alpha_1^H) \right] \left(\frac{1}{2} - \pi_{01} \right) \\
& + \underbrace{\left[(1 - K(\alpha_2^H)) \left(\frac{\theta^H}{c - \alpha_1^H} - 1 \right) + (1 - K(\alpha_1^H)) \left(\frac{\theta^H}{c - \alpha_2^H} - 1 \right) \right]}_{>0} \left(\pi_{11} - \frac{1}{2} \right) = 0.
\end{aligned}$$

If $\alpha_1^H = \alpha_2^H$, this condition is trivially fulfilled. For $\rho = \frac{1}{2}$, we would get a symmetric equilibrium with $\alpha_1^H = \alpha_2^H = c$. Thus, consider the case $\rho > 0$. Assume w.l.o.g $\alpha_1^H > \alpha_2^H$, so that $K(\alpha_1^H) > K(\alpha_2^H)$. As this implies $\pi_{11} - \frac{1}{2} > 0$, the equality above can only be satisfied if

$$\begin{aligned}
& \left[\frac{\theta^H K(\alpha_2^H)}{c - \alpha_1^H} - \frac{\theta^H (1 - K(\alpha_1^H))}{c - \alpha_2^H} - K(\alpha_2^H) \right] \left(\pi_{10} - \frac{1}{2} \right) < \\
& \left[\frac{\theta^H K(\alpha_1^H)}{c - \alpha_2^H} - \frac{\theta^H (1 - K(\alpha_2^H))}{c - \alpha_1^H} - K(\alpha_1^H) \right] \left(\frac{1}{2} - \pi_{01} \right). \tag{9}
\end{aligned}$$

However, $\alpha_1^H > \alpha_2^H$ implies $\pi_{10} \geq 1 - \pi_{01}$. Furthermore, we can show that

$$\begin{aligned}
& \frac{\theta^H}{c - \alpha_1^H} K(\alpha_2^H) - \frac{\theta^H}{c - \alpha_2^H} (1 - K(\alpha_1^H)) - K(\alpha_2^H) > \\
& \frac{\theta^H}{c - \alpha_2^H} K(\alpha_1^H) - \frac{\theta^H}{c - \alpha_1^H} (1 - K(\alpha_2^H)) - K(\alpha_1^H) \\
& \Leftrightarrow \frac{\theta^H}{c - \alpha_1^H} + K(\alpha_1^H) > \frac{\theta^H}{c - \alpha_2^H} + K(\alpha_2^H).
\end{aligned}$$

Hence, (9) cannot be satisfied. This contradicts the initial assumption that an asymmetric equilibrium exists. We conclude that there are only symmetric equilibria.

Interior and boundary equilibria

The proof follows the lines in the proof to Proposition 3, with the lower bound \underline{a} from Equation (6) in the main text replacing a_c , and $q(\alpha^H) = c$ for all α^H . If $R_H(\underline{a}, c, \underline{a}, 1, \rho) < 0$, there is at least one interior equilibrium with $\alpha^L = c$, $\alpha^H > \underline{a}$, and $s_{10} = 1$. If instead $R_H(\underline{a}, c, \underline{a}, 1, \rho) > 0$, there is a boundary equilibrium with $\alpha^L = c$, $\alpha^H = \underline{a}$, and $s_{10} \in (\frac{1}{2}, 1]$. In boundary equilibria, the voter is indifferent between all voting strategies, and

votes such that both candidates cannot profitably deviate from the strategy characterized by the cutoffs $\alpha^L = c$ and $\alpha^H = \underline{a}$.

Proof of Proposition 5

For the remainder of the appendix, define $g(\rho, s_{10}) = \pi_{10} - \frac{1}{2} = s_{10}\rho + (1 - s_{10})(1 - \rho) - \frac{1}{2}$. The term g represents the power share exceeding $\frac{1}{2}$ that a reforming candidate receives in equilibrium when running against a non-reforming opponent. Note that g is strictly increasing in s_{10} for $\rho > \frac{1}{2}$, and strictly increasing in ρ for $s_{10} > \frac{1}{2}$. To simplify notation, we suppress the arguments of g in the following.

In the final part of the proof to Proposition 4, we showed that at least one interior equilibrium exists if $R_H(\underline{a}, c, \underline{a}, 1, \rho) < 0$. The derivative of R_H with respect to α^H is given by

$$\frac{\partial R_H}{\partial \alpha^H} = \frac{1}{2} + (K(\alpha^H) + (\alpha^H - c)k(\alpha^H))g.$$

Under Assumption 1, it is strictly positive. Thus, R_H has exactly one root with $\alpha \in (\underline{a}, c]$ and $s_{10} = 1$ if and only if $R_H(\underline{a}, c, \underline{a}, 1, \rho) < 0$. Hence, there is a unique interior equilibrium. In this case, there is no boundary equilibrium since R_H is monotonic in s_{10} , and $R_H(\underline{a}, c, \underline{a}, \frac{1}{2}, \rho) < 0$.

If instead $R_H(\underline{a}, c, \underline{a}, 1, \rho) \geq 0$, then the positive derivative $\frac{\partial R_H}{\partial \alpha^H}$ implies that there exists no interior equilibrium. In this case, however, there is a unique boundary equilibrium. In this case, R_H is strictly increasing in s_{10} , while $R_H(\underline{a}, c, \underline{a}, \frac{1}{2}, \rho) < 0$ continues to hold. Consequently, R_H has a unique root with $s_{10} \in (\frac{1}{2}, 1]$ and $\alpha^H = \underline{a}$. As argued above, this constitutes an equilibrium as voters are indifferent between all voting strategies.

Proof of Lemma 1

By Proposition 4, the behavior of the public-spirited candidates does not depend on ρ . In contrast, changes in ρ affect the cutoff α^H of egoistic types, which is implicitly defined by equation (7) in the main text. Implicit differentiation gives

$$\frac{d\alpha^H}{d\rho} = -\frac{\frac{\partial R}{\partial \rho}}{\frac{\partial R}{\partial \alpha^H}} = -\frac{[\theta^H + (\alpha^H - c)K(\alpha^H)]g_\rho}{\frac{1}{2} + K(\alpha^H)g + (\alpha^H - c)k(\alpha^H)g} < 0.$$

By equilibrium condition (7), the numerator equals $\frac{c - \alpha^H}{2g}g_\rho$. It is strictly positive for all $\rho > \frac{1}{2}$, as the same is true for g_ρ . Under Assumption 1, the denominator is strictly positive as well. Consequently, the overall effect is negative.

Proof of Proposition 6

First, the unique equilibrium is always interior for $\rho = \frac{1}{2}$. In this case, winning and losing the election promises the same amount of power ($g = 0$), so that even egoistic candidates care only about their legacy payoff. As a consequence, equilibrium condition (7) is satisfied for $\alpha^H = c$.

As implied by Lemma 1, the cutoff α^H strictly decreases with ρ . Moreover, implicit differentiation of (7) gives $\frac{d\alpha^H}{d\theta^H} < 0$ and $\frac{d\alpha^H}{d\mu} < 0$ for any interior equilibrium with $\rho > \frac{1}{2}$. Two possible cases arise.

Case a: If $\theta^H < \underline{\theta}(\mu) = [1 + K(\underline{a})](c - \underline{a})$, then $R(\underline{a}, 1, 1) = \frac{1}{4}\theta^H + \frac{1}{4}[1 + K(\underline{a})](\underline{a} - c) < 0$ is true. Hence, there is an interior equilibrium for all $\rho \in [\frac{1}{2}, 1]$. (Note that K depends on \underline{a} as well as μ , the probability to draw an egoistic candidate.)

Case b: If $\theta^H \geq \underline{\theta}(\mu)$, we get $R(\underline{a}, 1, 1) \geq 0$. Hence, $R(\underline{a}, 1, \rho)$ attains negative values if and only if power concentration ρ is sufficiently small. Formally, there is a unique threshold $\bar{\rho}(\theta^H, \mu)$ such that $R(\underline{a}, 1, \rho) < 0$ is true, and an interior equilibrium exists, if and only if $\rho < \bar{\rho}(\theta^H, \mu)$.

The derivative of $\underline{\theta}(\mu)$ with respect to μ is given by

$$\underline{\theta}'(\mu) = [\Phi(\underline{a}) - \Phi(c)](c - \underline{a}) < 0.$$

Proof of Proposition 7

Selection with respect to office motivation

In any interior equilibrium, the expected degree of office motivation of the election winner is

$$\begin{aligned} E[\theta_w | \rho] &= (1 - K(\alpha^H))^2 \frac{(1 - \Phi(\alpha^H))\mu\theta^H}{1 - K(\alpha^H)} + K(\alpha^H)^2 \frac{\Phi(\alpha^H)\mu\theta^H}{K(\alpha^H)} \\ &\quad + 2(1 - K(\alpha^H))K(\alpha^H) \frac{(1 - \Phi(\alpha^H))\mu\theta^H}{1 - K(\alpha^H)} \\ &= \theta^H \mu [1 + K(\alpha^H) - \Phi(\alpha^H)] \end{aligned}$$

The derivative with respect to ρ is given by

$$\frac{dE[\theta_w | \rho]}{d\rho} = \theta^H \mu (\mu - 1) \phi(\alpha^H) \frac{d\alpha^H}{d\rho}$$

As $\frac{d\alpha^H}{d\rho} < 0$ by Lemma 1 and $\mu < 1$, it is always strictly positive.

Selection with respect to ability

The expected ability of the election winner is given by

$$E[a_w | \rho] = (1 + K(\alpha^H)) \left[(1 - \mu) \int_c^1 \phi(a) a da + \mu \int_{\alpha^H}^1 \phi(a) a da \right] \\ + K(\alpha^H) \left[(1 - \mu) \int_0^c \phi(a) a da + \mu \int_0^{\alpha^H} \phi(a) a da \right].$$

The derivative of this term with respect to ρ is given by:

$$\frac{dE[\theta_w | \rho]}{d\rho} = \left\{ -(1 + K(\alpha^H)) \mu \phi(\alpha^H) \alpha^H + k(\alpha^H) \left[(1 - \mu) \int_c^1 \phi(a) a da + \mu \int_{\alpha^H}^1 \phi(a) a da \right] \right. \\ \left. + \mu K(\alpha^H) \phi(\alpha^H) \alpha^H + k(\alpha^H) \left[(1 - \mu) \int_0^c \phi(a) a da + \mu \int_c^1 \phi(a) a da \right] \right\} \frac{d\alpha^H}{d\rho} \\ = \left\{ \int_0^1 \phi(a) a da - \alpha^H \right\} \mu \phi(\alpha^H) \frac{d\alpha^H}{d\rho}$$

Hence, this derivative is positive if the cutoff α^H exceeds the unconditional expectation $E[a_i] = \int_0^1 \phi(a) a da$, and negative otherwise. Because the cutoff is strictly decreasing in ρ , this implies that $E[\theta_w | \rho]$ is quasi-concave in ρ .

For $\rho = \frac{1}{2}$, the cutoff equals c , which by assumption exceeds $E[a_i]$. Hence, there exists a $\rho_A(\theta^H, \mu) \in (\frac{1}{2}, 1]$ such that $\frac{dA(g)}{dg} > 0$ for all $\rho < \rho_A(\theta^H, \mu)$.

Again, two cases can arise. First, if $\underline{a} < E[a_i]$ and θ^H is sufficiently high, there is a unique level of $\rho < \bar{\rho}(\theta^H, \mu)$ such that the cutoff α^H just equals $E[a_i]$. Then, the threshold $\rho_A(\theta^H, \mu)$ equals this unique level, and the winner's expected ability is strictly decreasing for all $\rho > \rho_A(\theta^H, \mu)$.

Second, if $\underline{a} \geq E[a_i]$ or θ^H is sufficiently low, the cutoff α^H exceeds the expected ability in all interior equilibria. Hence, $\rho_A(\theta^H, \mu) = \bar{\rho}(\theta^H, \mu)$. Note also that the winner's expected ability is strictly decreasing in ρ for all $\rho > \bar{\rho}(\theta^H, \mu)$, i.e., in all boundary equilibria. In these equilibria, the cutoff does not change with ρ . For increasing ρ , the voting strategy however allocates less winning probability to reforming candidates, which are the more able ones. Hence, increases in ρ always lead to worse selection with respect to ability in boundary equilibria.

Selection with respect to policy payoff

The expected policy payoff from an election winner is given by

$$E[x_w(a_w - c) | \rho] = [1 + K(\alpha^H)] \left[\mu \int_{\alpha^H}^1 (a - c) d\Phi(a) + (1 - \mu) \int_c^1 (a - c) d\Phi(a) \right].$$

As $\alpha^H < c$, its derivative in ρ is strictly negative:

$$\begin{aligned} \frac{dE[x_w(a_x - c)|\rho]}{d\rho} &= \left\{ \mu \phi(\alpha^H) \left[\mu \int_{\alpha^H}^1 (a - c) d\Phi(a) + (1 - \mu) \int_c^1 (a - c) d\Phi(a) \right] \right. \\ &\quad \left. + [1 + K(\alpha^H)] \mu \phi(\alpha^H)(c - \alpha^H) \right\} \frac{d\alpha^H}{d\rho} \end{aligned}$$

Proof of Proposition 8

Unique maximum

We measure welfare by the voter's expected utility from ex ante perspective, which is given by

$$\begin{aligned} W(\rho) &= E[V(\pi_1, x_1, x_2)] \\ &= 2 \left[\frac{1}{2} + K(\alpha^H)g(\rho, s_{10}) \right] \underbrace{\left[(1 - \mu) \int_c^1 \phi(a)(a - c) da + \mu \int_{\alpha^H}^1 \phi(a)(a - c) da \right]}_{z(\alpha^H)}. \end{aligned}$$

First, note that $z(\underline{a}) = 0$, and $z(\alpha) > 0$ for all $\alpha > \underline{a}$ by the construction of \underline{a} . Hence, welfare is strictly positive in all interior equilibria, and equals zero in all boundary equilibria. We conclude that the welfare-maximizing level of power concentration satisfies $\rho^* < \bar{\rho}(\theta^H, \mu)$ where the latter is strictly larger than $\frac{1}{2}$. Hence, the welfare maximizing ρ^* always gives rise to an interior equilibrium.

Second, we show that the welfare function is strictly quasi-concave for interior equilibria, $\rho < \bar{\rho}(\theta^H, \mu)$, where $s_{10} = 1$ and α^H is implicitly defined by (7). In an interior equilibrium, the derivative of W with respect to ρ is given by

$$\begin{aligned} \frac{dW}{d\rho} &= \frac{\partial W}{\partial \rho} + \frac{\partial W}{\partial \alpha^H} \frac{d\alpha^H}{d\rho} \\ &= K(\alpha^H)z(\alpha^H) + \left\{ (c - \alpha^H)k(\alpha^H) \left(\frac{1}{2} + K(\alpha^H)g \right) + z(\alpha^H)k(\alpha^H)g \right\} \frac{d\alpha^H}{dg} \\ &= \left\{ K(\alpha^H)z(\alpha^H) \left[\frac{1}{2} + (K(\alpha^H) + (\alpha^H - c)k(\alpha^H))g \right] \right. \\ &\quad \left. - \left[(c - \alpha^H)k(\alpha^H) \left(\frac{1}{2} + K(\alpha^H)g \right) + z(\alpha^H)k(\alpha^H)g \right] [\theta^H + K(\alpha^H)(\alpha^H - c)] \right\} \frac{1}{D} \\ &= \left\{ K(\alpha^H)z(\alpha^H) \left[\frac{1}{2} + K(\alpha^H)g \right] - (c - \alpha^H)k(\alpha^H) \left(\frac{1}{2} + K(\alpha^H)g \right) [\theta^H + K(\alpha^H)(\alpha^H - c)] \right. \\ &\quad \left. - z(\alpha^H)k(\alpha^H)g\theta^H \right\} \frac{1}{D} \\ &= \frac{1}{D} \left\{ [K(\alpha^H) - k(\alpha^H)(c - \alpha^H)] \frac{W(\rho)}{2} - k(\alpha^H)(c - \alpha^H) \frac{\theta^H}{2} \right\}, \end{aligned}$$

where $D > 0$ denotes the denominator of $\frac{d\alpha^H}{d\rho}$ and $k(\alpha^H) = \mu\phi(\alpha^H)$. Hence, the term in brackets has to equal zero in every extremum of W in the interval $(\frac{1}{2}, 1)$. Recall

that $W(\rho) > 0$ in all interior equilibria, and note that $\frac{dW}{d\rho}$ is strictly positive for $\rho = \frac{1}{2}$ (where $\alpha^H = c$). The necessary condition for an extremum can be rearranged to read

$$h(\rho) \equiv \frac{K(\alpha^H)}{k(\alpha^H)(c - \alpha^H)} - \left(1 + \frac{\theta^H}{W(\rho)}\right) = 0.$$

Note that h is continuous in ρ and that the sign of $\frac{dW}{d\rho}$ is identical to the sign of h . Under Assumption 2, its first term is strictly increasing in α^H and, consequently, decreasing in ρ . The second term is constant in every extreme value of W (root of h). Hence, h is strictly decreasing in ρ in each root. We conclude that h has at most one root, and that the welfare function has at most one maximum and no minimum in $[\frac{1}{2}, \bar{\rho}(\theta^H, \mu))$. Recalling that $W(\rho) = 0$ in all boundary equilibria, this implies that W is globally quasi-concave and has a unique maximum in $[\frac{1}{2}, 1]$.

Optimality of power dispersion

Proposition 8 states that some power dispersion is optimal if and only if θ^H exceeds a unique threshold $\tilde{\theta}(\mu) < \underline{\theta}(\mu)$.

First, full concentration of power is optimal if and only if $h(1) \geq 0$. This is true for $\theta^H \rightarrow 0$, where $\alpha^H = c$. The derivative of h in θ^H is given by

$$\frac{dh}{d\theta^H} = \frac{\partial h}{\partial \theta^H} + \frac{\partial h}{\partial \alpha^H} \frac{d\alpha^H}{d\theta^H}.$$

The first term is strictly negative, and the same is true for $\frac{d\alpha^H}{d\theta^H}$ in every interior equilibrium. Under Assumption 2, h is strictly increasing in α^H . Hence, the derivative $\frac{dh}{d\theta^H}$ is strictly negative in every interior equilibrium. We conclude that there is at most one threshold $\tilde{\theta}(\mu) > 0$ such that $h(1) = 0$ if $\theta^H = \tilde{\theta}(\mu)$ and $h(1) < 0$ if and only if $\theta^H < \tilde{\theta}(\mu)$.

Second, note that $W(\frac{1}{2}) > 0$ while $W(\rho) = 0$ for all $\rho \geq \bar{\rho}(\theta^H, \mu)$. For values of θ^H such that full power concentration induces a boundary equilibrium, full concentration of power can hence not be optimal. By continuity, the same holds for levels of θ^H slightly smaller than $\underline{\theta}(\mu)$. Hence, the threshold $\tilde{\theta}(\mu)$ for the optimality of power dispersion is strictly below $\underline{\theta}(\mu)$.

Third, implicit differentiation of the threshold $\tilde{\theta}$ with respect to μ gives

$$\tilde{\theta}'(\mu) = - \left. \frac{\frac{dh(1)}{d\mu}}{\frac{dh(1)}{d\theta}} \right|_{\theta=\tilde{\theta}(\mu)}.$$

We have shown that full power concentration can only be optimal if it induces

an interior equilibrium. Hence, $\left. \frac{dh(1)}{d\theta} \right|_{\theta=\tilde{\theta}(\mu)}$ is strictly negative as argued above. Moreover, $\frac{dh(\rho)}{d\mu}$ is given by

$$\frac{dh(\rho)}{d\mu} = \frac{\partial h(\rho)}{\partial \mu} + \frac{\partial h(\rho)}{\partial \alpha^H} \frac{d\alpha^H}{d\mu}.$$

This comprises a direct effect and an indirect effect of μ on the level of $h(\rho)$. The direct effect is given by

$$\begin{aligned} \frac{\partial h(\rho)}{\partial \mu} &= -\frac{\Phi(c)}{k(\alpha^H)(c - \alpha^H)} + \frac{\theta^H}{W(\rho)^2} \frac{\partial W(\rho)}{\partial \mu} \\ &< \frac{\theta^H}{W(\rho)^2} \left[2K_\mu(\alpha^H)gz(\alpha^H) + 2 \left[\frac{1}{2} + K(\alpha^H)g \right] z_\mu(\alpha^H) \right] \\ &< 0 \end{aligned}$$

The negative sign follows since $K_\mu(\alpha^H) = \Phi(\alpha^H) - \Phi(c) < 0$ and $z_\mu(\alpha^H) = \int_{\alpha^H}^c \phi(a)(a - c)da < 0$.

With respect to the indirect effect, implicit differentiation of (7) gives

$$\frac{d\alpha^H}{d\mu} = -\frac{K_\mu(\alpha^H)g(\alpha^H - c)}{\frac{1}{2} + K(\alpha^H)g + k(\alpha^H)(\alpha^H - c)g} < 0.$$

As h is strictly increasing in α^H as argued before, the indirect effect of μ on h is negative as well. Hence, the same is true for the derivative of h with respect to μ in every interior equilibrium.

Altogether, we find that $\tilde{\theta}'(\mu) < 0$. Hence, if the conflict of interest is increased with regard to μ , this decreases the level of egoism $\tilde{\theta}(\mu)$ up to which full power concentration is optimal.

Comparative statics of ρ^*

Finally, we show that the optimal level ρ^* is strictly decreasing in θ^H and μ whenever some power dispersion is optimal, i.e., when $\theta^H > \tilde{\theta}(\mu)$. In this case, the optimal level of power concentration is implicitly defined by $h(\rho^*) = 0$.

With respect to θ^H , implicit differentiation of h gives

$$\left. \frac{d\rho^*}{d\theta^H} \right|_{\rho=\rho^*} = - \frac{\frac{dh(\rho)}{d\theta^H}}{\frac{dh(\rho)}{d\rho}} \Bigg|_{\rho=\rho^*}.$$

Above, we have shown that the numerator $\frac{dh(\rho)}{d\theta^H}$ is strictly negative. The denominator

is strictly negative as well, as h is strictly decreasing in ρ in every root. Thus, the optimal level ρ^* is strictly decreasing in θ^H .

With respect to μ , implicit differentiation of h gives

$$\frac{d\rho^*}{d\mu} = - \frac{\frac{dh(\rho)}{d\mu}}{\frac{dh(\rho)}{d\rho}} \Bigg|_{\rho=\rho^*} .$$

As shown above, both numerator and denominator of this expression are strictly negative. Hence, the same is true for the whole derivative $\frac{d\rho^*}{d\mu}$.

Appendix B: Empirical analysis

Our model makes novel statements about the welfare effect of power concentration and its dependence on the conflict of interest between voters and politicians. A brief look at empirical evidence from established democracies may help illustrate the models' relevance.

Proposition 8 predicts an interaction between power concentration and the conflict of interest between voters and politicians summarized by the following hypothesis.

Hypothesis. *The effect of power concentration on welfare depends on the conflict of interest between voters and politicians. Power concentration has positive effects on welfare if the conflict of interest is low. In contrast, if the conflict of interest is high, the welfare effect of power concentration is significantly smaller or negative.*

In testing the hypothesis, we face a restriction to data availability. A focus on meaningful variations in institutional settings and in politicians' motivation requires a cross-country analysis, but measures for our key variables are only available for some established democracies. We nevertheless propose an empirical strategy to illustrate the consistency of our model predictions with the data.

Operationalization

The empirical analysis is based on three key variables. The dependent variable is a measure of efficient policies. The two major independent variables are the degree of power concentration within the political system and the conflict of interest between voters and politicians.

As a measure for *efficient policies*, we use growth in real GDP per capita (World Bank). It provides a concise and objective measure of developments that bear the potential of welfare improvements. Growth has been used as outcome variable by a number of other empirical studies on political institutions, such as Feld & Voigt (2003) and Enikolopov & Zhuravskaya (2007).

We measure the *concentration of power* within a political system by Lijphart's index of the executive-parties dimension (Lijphart 1999). This well-established measure quantifies how easily a single party can take complete control of the government. The index is based on the period 1945-1996 and is available for 36 countries.

The conflict of interest between voters and politicians cannot be measured objectively. However, indication for it may come from voter surveys. The International Social Survey Programme (ISSP) includes questions on voters' opinions about politicians. In its 2004 survey (ISSP Research Group 2012), conducted in 38 countries,

it included the item “Most politicians are in politics only for what they can get out of it personally.” Agreement with this statement was coded on a 5-point scale. We use mean agreement in a country as our measure for the conflict of interest between voters and politicians.

We normalize the indices for both power concentration and the conflict of interest to range between zero and one. High values indicate a strong concentration of political power or a strong conflict of interest of politicians, respectively.

Design

Data on both indices are available for 20 countries. Of these countries, New Zealand underwent major constitutional changes after 1996. These changes are not captured by the Lijphart index and we consequently exclude New Zealand from the analysis. As our model focuses on established democracies, we require that countries have a Polity IV Constitutional Democracy index (Marshall & Jaggers 2010) of at least 95 in the year 2002. This excludes Venezuela from the sample. The remaining 18 countries are similar with respect to their economic characteristics. They are economically highly developed (World Bank) and feature a Human Development Index (HDI) of at least 0.9. None of the exclusions changes the qualitative results of the analysis.

We find no correlation between power concentration and the conflict of interest (Pearson’s correlation coefficient $\rho = 0.199$, $p = 0.428$). Technically, this means that the analysis will not suffer from multicollinearity and that the hypothesis can be tested by a linear regression model even though the welfare function of our model is non-linear in power concentration.¹⁶ It also suggests that political institutions do not affect how voters perceive the motives of politicians.

The time-invariant dependent variables require a cross-section analysis. All explanatory variables correspond to 2004 or earlier years. To address problems of reverse causality, our explained variable captures growth after 2004. To test whether the welfare effect of power concentration varies with the conflict of interest, we include an interaction term between power concentration and the conflict of interest in the regression. We control for variables that may be correlated with both our explanatory variables and our explained variable. Most notably, past economic performance affects growth (see, e.g., Barro 1991, Sala-i-Martin 1994) and may alter

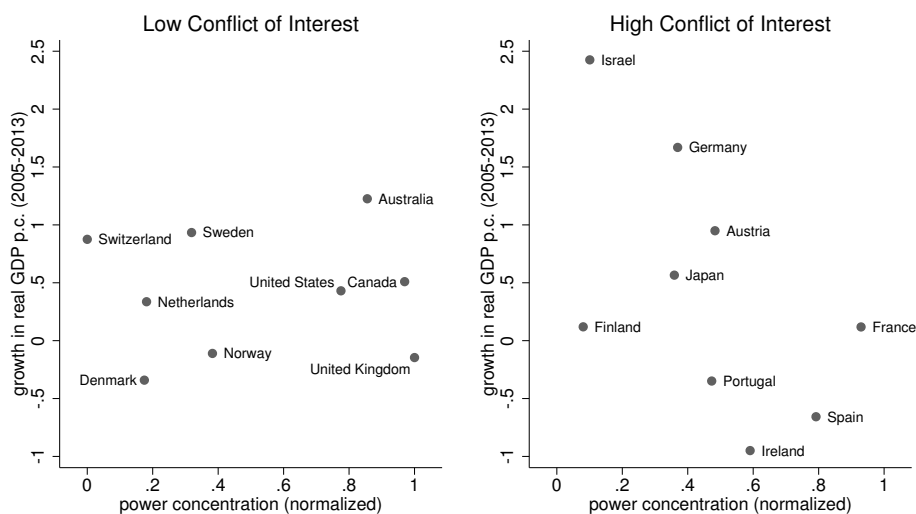
¹⁶If power concentration and the conflict of interest were negatively correlated, one might reject the hypothesis based on the observed average welfare effect even if the underlying model is true. The reason is that, in this case, countries in which the conflict of interest is strong might be on a more positively sloped part of the welfare function than countries in which the conflict of interest is low.

voters' perception of politicians. We hence control for GDP per capita in 2004. Growth is also affected by other variables, such as capital accumulation, school enrollment rates, life expectancy, or openness of the economy (see, e.g., Sala-i-Martin 1997). To capture these influences and to keep the number of explanatory variables low, we add past growth in real GDP per capita (from 1991 to 2004) to the regression.¹⁷

Results

For a first glimpse of the data, we split the country set at the median value of the conflict of interest between voters and politicians. Figure 5 shows how growth is related to the concentration of power for the two sets of countries. The left panel contains countries with a low conflict of interest, while the right panel contains countries with a high conflict of interest. The figure suggests that power concentration has only small effects on growth if the conflict of interest is low, whereas power concentration is harmful for growth if the conflict of interest is high.

Figure 5: Relationship between power concentration and growth



For the analysis of the relationship between power concentration and economic growth, we use the conflict of interest as a continuous explanatory variable in an OLS regression and control for relevant covariates. Table 2 presents the regression results.

Column (a) displays the results of a regression model without interaction term. In this regression, the coefficient of power concentration estimates the effect on

¹⁷Descriptive statistics for all variables are provided at the end of this appendix.

Table 2: OLS regression results

	Growth in real GDP per capita (2005-2013)	
	(a)	(b)
Power concentration	-0.526 (0.642)	4.224** (1.635)
Conflict of interest	-0.196 (1.305)	3.096** (1.235)
Power concentration × Conflict of interest		-9.530** (3.581)
Real GDP per capita in 2004 (in \$ 1000)	-0.020 (0.027)	-0.019 (0.019)
Growth in real GDP per capita (1991-2004)	-0.301*** (0.084)	-0.387*** (0.104)
Constant	2.160 (1.588)	0.755 (0.935)
adjusted R^2	0.13	0.42
F	9.26	5.32
N	18	18

Heteroskedasticity-robust standard errors are provided in parentheses. ***, **, * indicate significance at the 1-, 5-, and 10-percent level, respectively.

economic growth under the assumption that this effect does not depend on the conflict of interest between voters and politicians. We find that this coefficient is insignificant.

This picture changes if the interplay between power concentration and the conflict of interest is taken into account. Column (b) displays the results of a regression model with an interaction term between power concentration and the conflict of interest. Most importantly, the coefficient of the interaction term is negative and significant. Thus, power concentration is more negatively related to growth if the conflict of interest between voters and politicians is high. The inclusion of the interaction term in the regression also strongly increases the explanatory power of the econometric model. The adjusted R^2 increases from 0.13 to 0.42.

Table 3: Effect of power concentration

	minimal conflict of interest	maximal conflict of interest
Coefficient	4.224**	-5.306**
Standard error	1.635	2.083

The table depicts the coefficient of power concentration for the lowest level of conflict and for the highest level of conflict in the dataset. ***, **, * indicate significance at the 1-, 5-, and 10-percent level, respectively.

As it turns out, the welfare effect of power concentration depends strongly on the

conflict of interest. The conditional effect of power concentration at the lowest and the highest level of conflict of interest in our country set are reported in Table 3. At the lowest level of conflict, power concentration is positively related to growth. By contrast, at the highest level of conflict, power concentration is negatively related to growth. Our analysis thus leads to the following result.

Result. *The higher is the conflict of interest between voters and politicians, the more negative is the relation between power concentration and growth. Furthermore, power concentration is negatively related to growth if the conflict of interest is high and positively related to growth if the conflict of interest is low.*

We conclude that the data is in line with our model. While the evidence is only suggestive, it indicates that the effect of power concentrating institutions depend on the specific conditions of a country. The direction and the size of the effect seems to depend on the conflict of interest between voters and politicians. Hence, the data support our theoretically derived hypothesis.

Discussion of empirical results

We finally want to discuss potential issues with the analysis, the robustness of the result, and a potential alternative explanation for the result.

The specification we use is parsimonious and may give raise to a concerns of omitted variable bias. However, for an omitted variable to bias the coefficient of the interaction effect, it would have to be correlated with the interaction term between power concentration and the conflict of interest, and with growth potential. Any omitted variable bias, if existent, would have to be strong to explain the result. The most obvious candidate for an omitted variable is general trust amongst the population. Trust may be correlated with the perception of politicians' motivation and may reduce opposition towards power concentration. If in addition, trust had a non-linear effect on growth, the absence of a quadratic trust term would bias the coefficient of the interaction effect between power concentration and the conflict of interest. We control for this possibility and add general trust, as measured by the 2004 ISSP survey,¹⁸ as linear and quadratic term to our regression. This does not change our result.

To further confirm robustness of the result, we check whether the negative and significant interaction term between power concentration and the conflict of interest is robust to the use of different measures for our key variables. For any alternative

¹⁸The wording of the question is "Generally speaking, would you say that people can be trusted or that you can't be too careful in dealing with people?"

model run we provide the p-value of the interaction term and the F-statistic of the regression model in parenthesis. As alternative measures for power concentration we use a more recent index from Armingeon et al. (2011) ($p = 0.013$, $F = 5.75$, $N = 17$) as well as its modified version that focuses on institutional factors only ($p = 0.011$, $F = 6.87$, $N = 17$). We also use the index for checks and balances from Keefer & Stasavage (2003) and the index for political constraint from Henisz (2006). Again, the interaction effect shows the expected sign ($p = 0.019$, $F = 16.12$, $N = 18$ and $p = 0.060$, $F = 15.60$, $N = 18$, respectively). For the nine-categorical type of electoral system (IDEA 2004), however, the coefficient of the interaction term is insignificant ($p = 0.216$, $F = 5.32$, $N = 18$). As alternative measures for the conflict of interest between voters and politicians we use trust in political parties from the Eurobarometer (European Commission 2012) and from the European Social Survey (ESS 2002). For these specifications, the interaction term again is of the expected sign ($p = 0.034$, $F = 46.10$, $N = 11$ and $p = 0.027$, $F = 11.52$, $N = 14$, respectively). Using confidence in political parties as measured by the World Values Survey (WVS 2009), however, yields an insignificant interaction term ($p = 0.376$, $F = 383.25$, $N = 10$).

One might fear that our result is influenced by the financial crisis, which affected output beginning in 2008. To test whether this is the case, we may exclude countries from the sample that were hit hardest by the financial crisis. The result is robust to the exclusion of any subset of the countries Ireland, Spain, and Portugal (all p -values < 0.085 , $F > 2.53$).

Finally, it could be argued that the empirical observation is not caused by the channel described in our model but rather by the disciplining of rent-seeking politicians. This alternative channel has been addressed by Besley & Smart (2007) who analyze fiscal restraints that limit the office holders' discretion and thereby restrict rent extraction. Empirically, we cannot distinguish between our channel and this alternative, as measures for politicians' motivation may capture not only preferences for power, but also preferences for rent extraction. However, the model of Besley & Smart (2007) predicts a different interaction between power concentration and politicians' motivation than our model. They find that three of the four constraints they analyze enhance welfare only if the share of benevolent politicians is sufficiently large. Hence, the empirical findings are in line with our model but not in line with Besley & Smart (2007).

Data description

Description and sources of variables

Main variables

Growth in real GDP per capita	Average growth rate. Computed based on per capita GDP in constant 2005 US\$. World Bank (2012).
GDP per capita	Denominated in constant 2005 TUS\$. World Bank (2012).
Conflict of interest	International Social Survey Programme 2004: Citizenship I. ISSP Research Group (2012).
Power dispersion	Lijphart's index for executive-parties dimension. Lijphart (1999).

Variables for robustness checks

Trust in political parties	Eurobarometer 62.0 (2004). European Commission (2012). European Social Survey 2002/2003. ESS (2002). World Values Survey, third wave. WVS (2009).
Power dispersion	Time-variant proxy for Lijphart's executive-parties dimension, year 2004. Armingeon et al. (2011).
Power dispersion, institutional	Time-variant proxy for Lijphart's executive-parties dimension, institutional factors, year 2004. Armingeon et al. (2011).
Checks and balances	Number of veto players. Keefer & Stasavage (2003).
Political Constraint Index	Feasibility of policy change. Henisz (2006).
Electoral system	Type of electoral system, 9 minor categories. IDEA (2004).

Country list

Australia	Austria	Canada	Denmark
Finland	France	Germany	Ireland
Israel	Japan	Netherlands	Norway
Portugal	Spain	Sweden	Switzerland
United Kingdom	United States		

Summary of variables

	Mean	Std. dev.	Min	Max	Poss. values
Power dispersion	0.31	0.98	-1.21	1.77	[-2,2]
Conflict of interest	3.37	0.37	2.61	4.20	[1,5]
GDP p.c.	26.98	7.69	11.55	39.83	
GDP p.c. growth (2004-2011)	0.68	0.74	-0.61	2.40	
GDP p.c. growth (1991-2004)	2.08	1.07	0.56	5.59	

For the regression analysis, the variables power dispersion and the conflict of interest are rescaled to range between 0 and 1.

Correlation table

	Power dispersion	Conflict of interest	GDP p.c.	GDP p.c. growth (2004-2011)
Conflict of interest	-0.20 (0.43)	1		
GDP p.c.	0.20 (0.43)	-0.58 (0.01)	1	
GDP p.c. growth (2004-2011)	0.44 (0.07)	0.072 (0.78)	-0.15 (0.56)	1
GDP p.c. growth (1991-2004)	-0.27 (0.28)	-0.10 (0.69)	-0.021 (0.93)	-0.48 (0.05)

Pearson's correlation coefficient, *p*-values in parentheses.