Political Selection and the Optimal Concentration of Political Power*

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Abstract

We study how policy choice and political selection are affected by the concentration of political power. In a setting with inefficient policy gambles, variations in power concentration give rise to a trade-off. On the one hand, power-concentrating institutions allocate more power to the voters' preferred candidate. On the other hand, they induce the adoption of more overly risky policies and decrease the voters' capability to select well-suited politicians. We show that full concentration of power is optimal if and only if the conflict of interest between voters and politicians is small. Otherwise, an intermediate level of power concentration is optimal.

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1 Introduction

The concept of representative democracy is based on the premises that voters are able to elect well-suited politicians into office and that politicians adopt beneficial policies while in office.[1] Both aspects cannot be taken for granted. First, voters may face difficulties in distinguishing between good (competent, public-spirited) and bad (incompetent, egoistic) politicians. Second, politicians may choose policies that are not in the voters' best interests. Voters hence face the problem to simultaneously discipline politicians and to elicit better information about the politicians' qualities. The theoretical literature on political accountability studies how political institutions should be designed to solve these problems and increase voter welfare.[2]

We contribute to this literature by investigating the effects of institutions in a model where, first, policy outcomes are risky, and second, these risks are decreasing in the privately observable abilities of the politicians. The equilibria of the induced game involve inefficient policy gambles: the politicians choose overly risky policies in order to appear more competent and increase their chances for electoral success. Starting with Majumdar & Mukand (2004), a number of recent papers have studied electoral competition in models with this basic structure. However, most of these papers do not consider variations in the institutional setting. Our key contribution is, hence, to analyze the effects of political institutions on policy choice and political selection in a setting with inefficient policy gambles.

Specifically, we consider variations in the concentration of political power. We thereby follow the influential political scientists Arend Lijphart (1984, 1999) and George Tsebelis (1995, 2002), who argue for taking into account institutional configurations rather than studying specific institutions in isolation. According to both authors, the most important aspect of an institutional setting is the extent to which it concentrates or disperses political power, i.e., the capacity to change policy.[3] Empirically, there are large differences along this dimension even across established Western democracies. Political power is almost fully concentrated in the hands of the party winning the general election in the UK, while it is strongly dispersed be-

[1] As argued by James Madison (1788) in the Federalist #57, "[t]he 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."

[2] For recent surveys of this literature, see Besley (2006) and Ashworth (2012).

[3] Lijphart (1999) distinguishes between power-concentrating and power-dispersing variants for a catalogue of institutional aspects. He identifies two polar types of democratic systems, which he labels *majoritarian democracies* and *consensus democracies*. Tsebelis (1995) classifies institutional settings according to the implied number of veto players, defined as individual or collective actors whose consent is required for changing policy.

tween different political actors in Switzerland, the Netherlands and Belgium. Yet other countries such as the US and Germany feature intermediate levels of power concentration.

To investigate the effects of power concentration, we set up a stylized model of political competition with a representative voter and two candidates. The candidates are privately informed about their competences and their motivations (egoistic or public-spirited). We assume that the expected outcome of the political process is given by a weighted average of two policies, one proposed by an incumbent (the election winner) and one proposed by her opponent (the election loser).[4] We then vary the decision weight of the election winner, which we interpret as a measure for the concentration of political power. This modeling approach enables us to study continuous variations in the institutional setting instead of focusing on only two polar variants. As a result, we are able to account for the large set of hybrid institutions that can be observed empirically, as argued by Tsebelis (1995). Our approach also acknowledges that the effects of a specific institution – e.g., proportional representation – may depend on whether the election winner's power is otherwise unlimited or already restricted by other power-dispersing institutions. An obvious drawback of this strategy is that we do not capture the details of a particular real-world institution. We hence perceive our approach as complementary to papers who investigate the effects of specific institutional rules (e.g., Besley & Smart 2007, Buisseret 2016 and Cheng & Li 2018).

We derive three main results. First, we show that variations in power concentration give rise to a previously undiscussed trade-off that involves three distinguishable effects on voter welfare. On the one hand, power-concentrating institutions induce a direct positive *empowerment effect*. As long as political campaigns confer some information about candidate qualities, the voter selects the candidate that provides in expectation the highest welfare. Thus, an increase in power concentration gives on average more influence to the better-suited candidate, which ceteris paribus increases voter welfare. On the other hand, power-concentrating institutions induce negative *disciplining* and *selection effects*. By increasing the electoral stakes, they induce incompetent politicians to adopt more overly risky reforms in order to appear competent (disciplining effect). This increased mimicking also reduces the voter's capability to identify well-suited politicians and take a well-informed electoral choice (selection effect). Note that the resulting trade-off is specific to our setting with policy gambles. In contrast, the disciplining and selection effects go in opposite

[4] This formalization - sometimes referred to as *probabilistic compromise* - was first used to study political decision-making by Fishburn & Gehrlein (1977) and Grossman & Helpman (1996).

directions in models without policy gambles such as Besley & Smart (2007) and Hindriks & Lockwood (2009).

Second, we show that political power should only be concentrated completely in the hands of the election winner if the share of egoistic candidates is low, i.e., if the conflict of interest between the voter and the candidates is small. In all other cases, some limited dispersion of power between the election winner and the loser is optimal. This result provides a potential explanation for the combination of some power-concentrating institutions and some power-dispersing institutions in many countries, including the US and Germany (see Lijphart 1999 and Tsebelis 1995).

Third, we show that the optimal level of power concentration is decreasing in the size of the conflict of interest between voter and candidates. The basic intuition behind this result is the following: A larger conflict of interest induces the adoption of more overly risky policies and reduces the informativeness of campaigns, i.e., aggravates the disciplining and selection problems. As a consequence, it becomes more beneficial to decrease these inefficiencies by means of power-dispersing institutions, even though these allocate some power to inferior candidates. In Appendix C, we show that our theoretical result is consistent with illustrative data for a small set of established democracies.[5]

The paper proceeds as follows. The next section reviews the related literature. Section 3 discusses our modeling approach and its relation to real-world institutions. Section 4 presents the formal model of political competition. Section 5 delivers the benchmark case of perfect information, and Section 6 analyzes equilibrium behavior under two-dimensional private information. We examine the effects of power-concentrating institutions in Section 7, and conclude in Section 8. The appendix provides all formal proofs, a graphical illustration and a brief look at illustrative data.

2 Related literature

This paper contributes to the theoretical literature on political accountability, as surveyed by Besley (2006) and Ashworth (2012). This literature investigates the effects of a variety of political institutions on policy choice and political selection. A few papers consider institutions that are closely related to the concept of power

[5]In particular, we study the joint variation of a) a measure for the conflict of interest, b) a measure for power concentration, and c) economic growth as a measure for the performance of economic policy-making for a set of 18 established democracies. We document that economic growth and power concentration are positively correlated in countries with a low conflict of interest, but negatively correlated in countries with a large conflict of interest. A rigorous test for a causal relationship is, however, beyond the scope of this paper.

concentration, using models without policy gambles. Most prominently, Besley & Smart (2007) ask whether office-holders should be restricted by fiscal restraints. In a similar setting, Hindriks & Lockwood (2009) study the effects of fiscal decentralization. Both papers use models where the politicians are privately informed about their motivations (egoistic or public-spirited) and can engage in shirking or rent extraction *á la* Barro (1973) and Ferejohn (1986). They find that reducing the incumbent's scope of action improves policy choice, but reduces the voters' capabilities to remove egoistic candidates from office. Ashworth & Bueno de Mesquita (2016) study whether political authority should be unified or divided, using a setting where politicians are not informed about their own abilities and exert non-verifiable effort, as in the career-concerns model by Holmström (1999). They find that unified authority induces the provision of higher effort, but hinders political selection.

Our paper also contributes to the growing literature on policy gambles, starting with Majumdar & Mukand (2004). Similar settings are used in Fox & Van Weelden (2010), Fox & Stephenson (2011), Fu & Li (2014), Buisseret (2016), Cheng & Li (2018) and Dewan & Hortala-Vallve (2017). All these papers commonly assume that policy making involves inherent risks that are decreasing in the privately observable abilities of the politicians. In this setting, electoral incentives induce office-motivated politicians to adopt overly risky policies in order to signal high ability.

Among these papers, Buisseret (2016) and Cheng & Li (2018) are the only ones who study the effects of political institutions on policy choice and political selection. Specifically, Buisseret (2016) analyzes whether an incumbent and a veto player should be held accountable separately (in two independent elections) or jointly (in a single election). On the one hand, joint accountability leads to less flexibility in holding officials accountable. On the other hand, it provides the voter with better information, as it reduces the veto player's incentive to boost her reputation by rejecting the incumbent's policy. Cheng & Li (2018) compare the effects of fiscal centralization and fiscal decentralization. They show that voters are better able to elicit information about an incumbent's competence under fiscal centralization, as each district's performance provides an additional signal about the same politician.[6]

3 Modeling political institutions

In the next section, we set up a formal model of political competition with two candidates. Prior to the election, each candidate $i \in \{1, 2\}$ commits to a policy

[6]Besides, Fox & Van Weelden (2010), Fox & Stephenson (2011) and Fu & Li (2014) study how certain institutions affect the policy choice by an exogenously given office-holder. In contrast to the present paper, however, they do not model political selection.

platform x_i in a policy space X to be specified below. We assume that the implemented policy is in expectation given by the weighted average $x = \pi_1 x_1 + \pi_2 x_2$, where the policy weights π_1 and $\pi_2 = 1 - \pi_1$ take values in $[0, 1]$.

This expected policy can be interpreted as the outcome of a *probabilistic compromise* as in Grossman & Helpman (1996) and Sahuguet & Persico (2006). As a result of the political process, candidate i is drawn to choose policy with probability π_i. Hence, the implemented policy equals either x_1 or x_2 ex post. An alternative interpretation of this formalization is that the politicians have to decide on a continuum of ex ante identical public projects, and that candidate i is allocated the right to decide on the share π_i of these projects. In this case, the implemented policy x is a non-probabilistic compromise that involves elements of both platforms x_1 and x_2 ex post. Given both interpretations, the policy weight π_i can naturally be interpreted as a measure of i's decision-making rights, i.e., her share of political power. For the sake of clarity, we will stick to the first interpretation in the following.

A central assumption in our model is that the policy weights π_1 and π_2 are not only affected by the election result, but also by institutions that shape the political process. To formalize this idea, we represent the political institutions by a parameter ρ and assume that candidate i's political power π_i is given by

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

The higher parameter ρ is, the more political power is assigned to the election winner and the less power is retained by the election loser. Correspondingly, we refer to ρ as the degree of power concentration.

This reduced-form approach is similar to the modeling of political institutions in Sahuguet & Persico (2006), Saporiti (2014), Herrera et al. (2016) and Matakos et al. (2016). We interpret parameter ρ as a measure of the entire institutional configuration of a political system, and allow it to vary continuously in the interval $[1/2, 1]$. The main reason for this modeling decision is that real-world political systems rarely coincide with the two ideal types of majoritarian and consensus democracies. In practice, most political systems are considered as hybrid systems with varying degrees of implied power concentration (see Tsebelis 1995, Lijphart 1999). The polar case $\rho = 1$ represents a political system where power is fully concentrated, i.e., the election winner has full policy discretion. Arguably, this case can be seen as an idealized representation of majoritarian democracies such as the UK and a number of countries with British colonial heritage. Lower values of ρ represent political systems where power is dispersed, i.e., the election loser retains a substantial influence on policy choice. The consensus democracies of Switzerland, the Netherlands, Belgium and Israel are commonly seen as political systems with particularly low levels of power concentration.

Our modeling approach also allows us to capture differences between power-dispersing and power-concentrating institutions as variations in the level of the parameter ρ. For the sake of concreteness, consider the difference between unicameral and bicameral legislatures. In unicameral systems, the dominating party in parliament commands almost unlimited political power. There are no further veto players who can block the ruling party's policy. In bicameral systems with an almost equally strong second chamber, in contrast, there is a substantial probability that both chambers are dominated by different parties at any specific point in time. Hence, the impact of the ruling party on policy choice is on average larger in unicameral systems than in bicameral systems. A similar argument can be made with respect to presidential systems, where the president's party can sometimes be dominated in parliament.[7] In both cases, opposition parties can use their majority in the second chamber (or in parliament) to veto government policies and to substantially affect the adopted policies.[8]

As emphasized by Lijphart (1984, 1999) and Tsebelis (1995, 2002), power-dispersing institutions do not only restrict the ruling party's power. Instead, they exert pressure on the ruling party to adopt compromising policies and provide opposition parties with a significant influence on policy choice. Our modeling of political institutions in (1) accounts for this view by assigning a strictly positive policy weight to the election loser whenever $\rho < 1$.

4 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 candidates have to decide on whether or not to conduct a reform. More precisely, each candidate i chooses a policy proposal x_i from the

[7] In the US, episodes with *divided government* cover 45 out of 74 years since 1945 (in 13 of these years, the House and the Senate were additionally controlled by different parties). In France, there have been three periods of *cohabitation* since 1986, covering 9 out of 31 years. In Western Germany, the second chamber (Bundesrat) was controlled by the governmental parties in only 24 out of 70 years since 1949, while it was controlled by opposition parties in 12 years (in 34 years, neither the governmental parties nor the opposition parties possessed a majority in the Bundesrat).

[8] Several other institutional features affect the allocation of political power in a similar way, including federalism, supermajority requirements, judicial review, and public referendums.

unit interval $[0,1]$. It represents the magnitude of the implemented reform, where 0 represents the status quo and 1 represents a full-scale reform. Reforms of any magnitude are costly and risky. The voter elects one candidate, thereby allocating political power, i.e., the right to set policy. As explained in the previous section, the institutional setting determines whether power is allocated completely to the election winner or divided between election winner and loser.

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, a policy decision is taken.

4.1 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 $c \in (0,1)$, which the voter bears. Thus, the voter benefits from a reform if and only if it succeeds. In summary, if the implemented reform has magnitude x, the voter receives the payoff

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

As assumed in (1), the implemented policy x depends on the institutional parameter ρ. If political power is dispersed, $\rho < 1$, each candidate is entitled to implement her policy proposal with a strictly positive probability. Conditional on the election result, voter welfare thus follows as

$$V(w,\rho,x_1,x_2) = \sum_{i=1}^{2} \pi_i(w,\rho)\; v\left(x_i\right) \tag{3}$$

The representative voter chooses one candidate as the election winner $w \in \{1,2\}$. As the candidates' characteristics are unobservable, he can condition his ballot only on the proposed policies. 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.

4.2 Candidates

Prior to the election, each candidate $i \in \{1, 2\}$ proposes a policy $x_i \in [0, 1]$. After the election, the right to set policy and the spoils of office are split between both candidates. We assume that both aspects of political power – political influence and office spoils – are allocated jointly depending on the vote result and the institutional setting. In particular, the probability that i's proposal x_i is implemented as well as i's share of office spoils are equal to $\pi_i \in \{\rho, 1 - \rho\}$ (as in Sahuguet & Persico 2006 and Iaryczower & Mattozzi 2013). This assumption reflects the view that (egoistic) candidates have a desire for commanding as much power as possible, instead of winning an election per se. On a more fundamental level, the desire for maximizing power may either result because higher levels of political power lead to larger psychological ego rents, or because higher levels of power simplify rent extraction and clientelism (see, e.g., Persson et al. 1997, Diermeier & Merlo 2000).

The assumption that the election winner's share of office spoils is identical to his policy influence simplifies the analysis, but it is not crucial. Our qualitative results remain valid as long as institutional changes have a substantial – but potentially weaker – effect on the winner's office spoils. Our results would change, however, under the assumption that the election winner receives the entire office rents irrespective of the level of power concentration ρ.[9]

We assume that the candidates are heterogeneous in and privately informed about two independently distributed characteristics: their abilities and their motivations. First, they differ in their abilities to design a welfare-enhancing reform. If candidate i implements a reform of any amount $x_i > 0$, it succeeds with the idiosyncratic probability $a_i \in [0, 1]$. We henceforth refer to parameter a_i as candidate i's ability. 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 unit interval.

Second, candidates differ in their motivations, captured by the preference parameter θ_i. This parameter measures the utility gain that candidate i enjoys if he receives the full spoils of office. It can take two possible values, $\theta^H > 0$ or $\theta^L \in \left(0, \theta^H\right)$. In the following, we refer to candidates with preference parameter θ^H as egoistic, and candidates with θ^L as public-spirited. To simplify the exposition,

[9]Specifically, assume that the loser receives only a share $z(1 - \rho)$ of the office spoils, with $z \in [0, 1]$. As long as z is larger than some threshold $\hat{z} \in (0, 1/2)$, an increase in power concentration induces the adoption of more inefficient reforms and gives rise to the same trade-off between a positive *empowerment effect* on the one hand, and negative *disciplining* and *selection effects* on the other hand. For $z \in [0, \hat{z})$, in contrast, higher power concentration leads to a reduction of inefficient reforms, so that all three effects go in the same direction. In this case, full concentration of power is unambiguously optimal.

we concentrate on the limit case $\theta_L \to 0$, where public-spirited candidates do not care for the spoils of office at all.[10] In this case, public-spirited candidates propose a reform if and only if it is welfare-enhancing, $a_i \geq c$, as we show below. Both candidates' preference parameters are realizations of identically and independently distributed random variables, where $\mu \in (0, 1]$ denotes the probability that $\theta_i = \theta^H$. Note that our analysis nests the special case where all candidates are egoistic. In this case, candidates are only heterogeneous in the ability dimension.

We assume that the candidates are driven by a mixture of policy considerations and office motivation as in Maskin & Tirole (2004). If candidate i proposes policy x_i and the election outcome is given by w, her expected utility[11] follows as

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

The first term in (4) captures the candidate's interest in providing efficient policies. Note that the candidate only cares about the welfare increase that is related to her own policy, i.e., about her legacy to the public (Maskin & Tirole 2004). The legacy payoff depends both on her policy proposal and on her private ability a_i, i.e., the probability that her policy is successful. Alternatively, we could assume that the candidate is interested in maximizing voter welfare per se, including the voter's payoff from her opponent's policy. The second term in (4) represents candidate i's office rents, i.e., the utility from enjoying the share π_i of the spoils of office. The preference parameter θ_i measures how much candidate i cares about the spoils of office, relative to the legacy payoff.

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

For the remainder of the paper, we impose two assumptions on the joint distribution of the candidates' types.

Assumption 1. *The joint type distribution satisfies the condition*

$$\mu > \frac{\int_c^1 (a - c) d\Phi(a)}{\int_0^c (c - a) d\Phi(a)} . \tag{5}$$

[10] Instead of imposing $\theta_L = 0$ directly, we consider the limit case $\theta_L \to 0$ to ensure equilibrium uniqueness. This is guaranteed for any $\theta_L > 0$, but not for $\theta_L = 0$. All qualitative results of this paper hold for any case $\theta^L \in \left(0, \theta^H\right)$ (see also footnote 16).

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

Assumption 1 imposes bounds on the expected ability $E[a]$ and the share μ of egoistic candidates. First, it requires the expected ability to be smaller than the unit cost of a reform, i.e., $\int_0^1 a\phi(a)da < c$. If and only if this condition is met, the right-hand side of (5) is smaller than 1. In this case, condition (5) is satisfied if and only if the share of egoistic candidates is large enough.[12] Together, these restrictions ensure that the selection problem is sufficiently large to eliminate uninteresting cases. In particular, it rules out pooling equilibria in which egoistic candidates take the same action for all ability levels $a_i \in [0,1]$. In these equilibria, political institutions would not affect the behavior of politicians.

The second assumption is expressed using the auxiliary function $K(a) := \mu\Phi(a) + (1-\mu)\,\Phi(c)$ and its derivative $k(a) = \mu\phi(a)$. Both functions will prove useful in the following analysis. We refer to K as the weighted ability distribution, as it measures the probability that a randomly drawn candidate is either egoistic with ability below a, or public-spirited with ability below c.

Assumption 2. *For all $a \in (0,c)$, $k(a)$ is bounded from above with $k(a) < \frac{1+K(a)}{c-a}$.*

Assumption 2 rules out type distributions with a particularly large share of egoistic candidates with low abilities. For a large range of distribution functions including the uniform distribution, it is ensured given any level of $\mu \in (0,1]$.[13] As will become clear below, this condition rules out the existence of multiple equilibria.

4.3 Equilibrium concept and normative criterion

We solve for Perfect Bayesian equilibria (PBE) of this game that are robust to the refinement criteria D1 (Cho & Kreps 1987) and "unprejudiced beliefs" (Bagwell & Ramey 1991). A PBE 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. The D1 criterion is a commonly used equilibrium refinement that restricts the set of viable out-of-equilibrium beliefs. Imposing "unprejudiced beliefs" allows to apply D1 in our game with multiple senders.[14] Finally, we assume that the voter elects each candidate

[12] For a uniform distribution of abilities, Assumption 1 is met if $c > 1/2$ and $\mu > \left(\frac{c-1}{c}\right)^2$.

[13] For the case of a uniform distribution, Assumptions 1 and 2 are jointly satisfied if the conditions in footnote 12 are met. Assumption 2 is also satisfied for all levels of μ if the distribution function has a (a) weakly increasing density or (b) weakly decreasing density and $\phi(0) < 1/c$.

[14] Intuitively, D1 requires off-equilibrium beliefs to be "reasonable" in the sense that a deviation must be associated to the type that profits most from it. Assume that, in our multi-sender

with probability 1/2 if both candidates propose the status quo policy. In this case, the voter's beliefs do not matter because both proposed policies provide the same payoff irrelevant of the candidates' types. Hence, flipping a fair coin represents a natural tie-breaking rule.

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 the expected utility of the representative voter, which we refer to as voter welfare in the following. More precisely, we evaluate voter welfare at the ex ante stage, i.e., before candidates' abilities and motivations are drawn.

5 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: Each candidate proposes a full-scale reform if her ability is above c, and the status quo policy if her ability is below c. For each type, this behavior maximizes both the candidate's electoral prospects and her contribution to voter welfare. 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 power concentration. Variations in 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 also provides a 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 her ability exceeds the reform cost c. Voter welfare is maximized if political power is concentrated completely in the hands of the election winner.*

game, only candidate i deviates to an off-equilibrium action, while her opponent $-i$ sticks to her equilibrium strategy. "Unprejudiced beliefs" require that such a deviation by i does not affect the voter's beliefs on candidate $-i$ (see Honryo & Vida 2017 and Honryo 2018 for useful discussions).

6 Equilibrium analysis

For the remainder of this paper, we assume that candidates are privately informed about their abilities as well as their motivations. The following proposition establishes the existence of a unique D1 equilibrium and characterizes the equilibrium behavior of candidates. It thus provides the basis for the following analysis of the effects of political institutions.

Proposition 2. *Let Assumptions 1 and 2 hold. Then, there is a unique D1 equilibrium. For each candidate $i \in \{1, 2\}$, the equilibrium strategy X_i^* is characterized by a threshold $\alpha^H \in (0, c)$ such that*

$$X_i^*(a_i, \theta^L) = \begin{cases} 0 & \text{if} \quad a_i < c, \\ 1 & \text{if} \quad a_i \geq c, \end{cases}, \qquad \text{and} \qquad X_i^*(a_i, \theta^H) = \begin{cases} 0 & \text{if} \quad a_i < \alpha^H, \\ 1 & \text{if} \quad a_i \geq \alpha^H. \end{cases} \tag{6}$$

The proposition states that there is a unique D1 equilibrium, which is symmetric and displays the following three properties: (i) for each motivation type θ^j, candidate i proposes a reform if and only if her ability is above some cutoff $\alpha^j \in (0, c)$, (ii) the candidate reverts to the extreme policies and either proposes the status quo or a full reform, (iii) the cutoff α^H of egoistic candidates is below c, i.e., egoistic candidates propose overly risky reforms, while public-spirited candidates propose reforms if and only if they are efficient.

The intuition behind Proposition 2 is based on the observation that the candidates' implied preferences on policy proposals satisfy the Gans & Smart (1996) single-crossing property: Whenever candidate i with ability a' and motivation type θ^j weakly prefers a larger policy x_b to a smaller policy x_a, any candidate with higher ability $a'' > a'$ and the same motivation type strictly prefers x_b to x_a (and vice versa). This property holds for any strategy of the voter and candidate $-i$. For the intuition, assume that i changes her proposal from the smaller policy x_a to the larger policy x_b. The resulting change in her office rents does not depend on her ability. The more able she is, however, the larger is the increase in her legacy payoff. As a result, strategy $X_i^*(a, \theta)$ of candidate i is monotonically increasing in a_i in every equilibrium.

For property (i), note first that candidate i proposes the status quo $x_i = 0$ for a subset of types in every PBE. By Assumption 1, the average ability is below the unit cost c of a reform. Hence, if i does not propose the status quo for any type, she has to propose at least one policy $x' > 0$ for a subset of types with expected ability below c, i.e., with a negative expected payoff. But then, a deviation from x' to the status quo makes the voter better off and, hence, increases i's winning probability.

As a result, this deviation is profitable whenever i's ability is below c.

Second, candidate i plays a cutoff strategy that involves only the status quo and one other policy. Denote by $\tilde{x}_i$ the largest reform proposal on the equilibrium path. By the single-crossing property, $\tilde{x}_i$ is proposed by the candidates with the highest abilities and associated with a larger winning probability and larger office rents than all other proposals. This insight implies, however, that i also proposes $\tilde{x}_i$ if her ability is equal to c. In this case, she is only interested in maximizing her office rents because her legacy payoff is always zero. Due to the monotonicity of X_i^*, i thus proposes the same policy $\tilde{x}_i$ for all abilities between c and 1. Therefore, any policy $x' \notin \{0, \tilde{x}_i\}$ could only be proposed by ability types below c, and would hence be associated with a negative expected policy payoff and a lower winning probability than the status quo. As argued above, i could hence increase both her expected power and her legacy payoff by deviating from x' to 0. We conclude that i only proposes one reform $\tilde{x}_i$ and the status quo in equilibrium.

By property (ii), high-ability candidates with $a_i \geq \alpha_i^j$ propose a full reform with $\tilde{x}_i = 1$ in every D1 equilibrium. The D1 criterion requires that the voter associates any deviation to an off-equilibrium action to the type for whom this deviation is most profitable.[15] In our model, this refinement eliminates all equilibria in which only a partial reform $\tilde{x}_i < 1$ is proposed. Intuitively, the single-crossing property implies that the most able candidates have the strongest incentive to deviate from $\tilde{x}_i < 1$ to the full reform $x_i = 1$. Hence, D1 requires the voter to associate the deviation to types with $a_i = 1$ and to expect a larger payoff from the full reform than from $\tilde{x}$. Given this belief, the deviation to the full reform increases i's expected power and is always profitable for high-ability candidates.

In contrast, the D1 criterion does not eliminate a PBE in which only the full reform and the status quo are proposed. In this case, the single-crossing property has two implications: First, among the reforming candidates with $a_i \geq \alpha_i^j$, those with the lowest ability have the strongest incentive to deviate from the full reform to any smaller reform $x' < 1$. Second, among the non-reforming candidates with $a_i < \alpha_i^j$, those with the highest ability have the strongest incentive to deviate from the status quo to $x' > 0$. In sum, D1 requires the voter to associate the deviation to a type with cutoff ability $\alpha_i^j < c$ and, hence, to expect a negative policy payoff from any partial reform x' off the equilibrium path. But then, the deviation reduces the candidate's winning probability and is not profitable to any type.

For property (iii), note that public-spirited candidates are only interested in

[15] By imposing unprejudiced beliefs, moreover, we require the voter to adapt only his belief on the type of the deviating candidate i and not his beliefs on the type of her opponent $-i$.

maximizing their legacy payoff for θ^L equal to 0. To achieve this goal, they propose a full reform if their ability is above c and the status quo otherwise. In contrast, egoistic candidates are interested in maximizing a mixture of their legacy payoff and their expected office rents. If they proposed only efficient reforms as well, then the voter would strictly prefer reforming candidates to non-reforming ones. But then, egoistic candidates would have an incentive to propose a reform even if their ability is slightly below c, thereby achieving higher office rents at the cost of a marginally reduced legacy payoff. Thus, the cutoff α^H must be located below c: Egoistic candidates propose overly risky reform in every D1 equilibrium.[16]

We proceed by characterizing the equilibrium level of cutoff α^H, i.e., the equilibrium behavior of egoistic candidates. It proves useful to introduce two additional pieces of notation. First, we denote by $s_{10} \coloneqq s(1,0)$ the probability that the voter opts for a reforming candidate if her opponent proposes the status quo. Second, we define the number $\underline{a} \in (0,1)$ implicitly by

$$\mu \int_{\underline{a}}^{1} \phi(a)\,(a-c)\,da + (1-\mu) \int_{c}^{1} \phi(a)\,(a-c)\,da = 0. \tag{7}$$

If the cutoff α^H of egoistic types is at ability level $\underline{a}$ as defined by (7), the expected ability of a reforming candidate is equal to c. Thus, $\underline{a}$ represents a lower bound for α^H: If and only if the egoistic candidates' strategy involves a higher cutoff than $\underline{a}$, the voter expects a larger policy payoff from a reforming candidate than from a candidate who proposes the status quo. Note that $\underline{a}$ is strictly positive by Assumption 1.

Corollary 1. *Under Assumptions 1 and 2, the unique D1 equilibrium is either*

1. *a type I equilibrium with $\alpha^H \in (\underline{a}, c)$ and $s_{10} = 1$, or*
2. *a type II equilibrium with $\alpha^H = \underline{a}$ and $s_{10} \in \left(\frac{1}{2}, 1\right]$.*

Corollary 1 implies that the unique equilibrium is characterized by a tuple $\left(\alpha^H, s_{10}\right)$ 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 1. Second, a candidate with type $\left(\alpha^H, \theta^H\right)$ must be indifferent between proposing the full-scale reform and the status quo, if the behavior of all other agents

[16] If public-spirited candidates care about the spoils of office with $\theta_L \in (0, \theta_H)$, they play a cutoff strategy with inefficient reform proposals as well. In particular, both type-specific cutoffs satisfy $\alpha_L - c = (\alpha^H - c)\theta_L/\theta_H > 0$. Moreover, both cutoffs are strictly increasing in the degree of power concentration (see Lemma 1 below).

is characterized by $\left(\alpha^H, s_{10}\right)$. Formally, this indifference condition is given by

$$R(\alpha^H, s_{10}, \rho) \coloneqq \underbrace{g(\rho, s_{10})\ \theta^H}_{\text{gain in office rents}} + \underbrace{\left[\frac{1}{2} + K(\alpha^H)\ g(\rho, s_{10})\right]\left(\alpha^H - c\right)}_{\text{loss in legacy payoff}} = 0\ , \qquad (8)$$

where $g(\rho, s_{10}) \coloneqq 2(\rho - 1/2)(s_{10} - 1/2)$. We refer to R as the reform incentive function. 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 $\left(\alpha^H, s_{10}\right)$ and institution ρ. If the agent proposes a reform instead of the status quo, his winning probability increases by $s_{10} - 1/2$ and his expected political power increases by $g(\rho, s_{10}) = 2(\rho - 1/2)(s_{10} - 1/2)$.[17] On the one hand, this directly yields a gain in office rents (first term in 8). On the other hand, the candidate incurs a policy loss, because the expected payoff from this policy is negative given his ability $\alpha^H < c$ (second term in 8). At the equilibrium values α^H and s_{10}, both effects outbalance each other. Assumption 2 ensures that the reform incentive function is monotonically increasing in α_H. In consequence, the D1 equilibrium is unique.

Corollary 1 distinguishes between type I and type II equilibria. In a type I equilibrium, 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 type I equilibria, equation (8) implicitly defines the equilibrium cutoff α^H. In type II 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, her set of optimal strategies includes a unique voting strategy $s_{10} \in \left(\frac{1}{2}, 1\right]$ such that the indifference condition (8) is satisfied given $\alpha^H = \underline{a}$.

7 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 winning party in the elections for the House of Commons, while power is considerably more dispersed between several parties and multiple political actors in Switzerland and Belgium. In the following section, we show that these variations in the

[17] Recall that the difference between the political power of the election winner and the loser is given by $\rho - (1 - \rho) = 2(\rho - 1/2)$.

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.

7.1 Effects on behavior

With asymmetric information about the 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. *Under Assumptions 1 and 2, increasing power concentration induces the proposal of more inefficient reforms,* $\frac{d\alpha^H}{d\rho} < 0$*, in every type I equilibrium.*

In type I equilibria, a reforming candidate wins the election whenever she runs against a non-reforming opponent because the voter's expected payoff from a reform is positive. Consequently, an increase in power concentration allocates in expectation more power to reforming candidates and less to non-reforming candidates. Intuitively, this reallocation of power makes it more attractive to propose a reform. Hence, egoistic candidates become willing to take even more excessive risks, i.e., propose reforms at even lower abilities. More formally, the equilibrium cutoff α^H shifts downwards. Figure 1 on the next page illustrates this relationship.

The strength of electoral incentives also determines whether a type I equilibrium or a type II equilibrium arises.

Proposition 3. *Let Assumptions 1 and 2 be satisfied. There is a strictly decreasing function* $\bar{\theta}(\mu)$ *such that the unique D1 equilibrium is of type I for all levels of power concentration if* $\theta^H < \bar{\theta}(\mu)$*, i.e., the conflict of interest is small. Otherwise, there is a function* $\bar{\rho}(\theta^H, \mu) \in (1/2, 1]$ *such that the equilibrium is of type I if and only if power concentration* ρ *is below* $\bar{\rho}(\theta^H, \mu)$*.*

For a small conflict of interest, $\theta^H < \bar{\theta}(\mu)$, egoistic candidates only care to a limited extent for the spoils of office. Hence, they are only willing to accept limited policy risks, and the cutoff α^H remains above its lower bound $\underline{a}$ even with fully concentrated power $\rho = 1$. By Lemma 1, the cutoff will be even higher for all other levels of ρ: A type I equilibrium arises for all levels of power concentration (see dashed line in Figure 1).

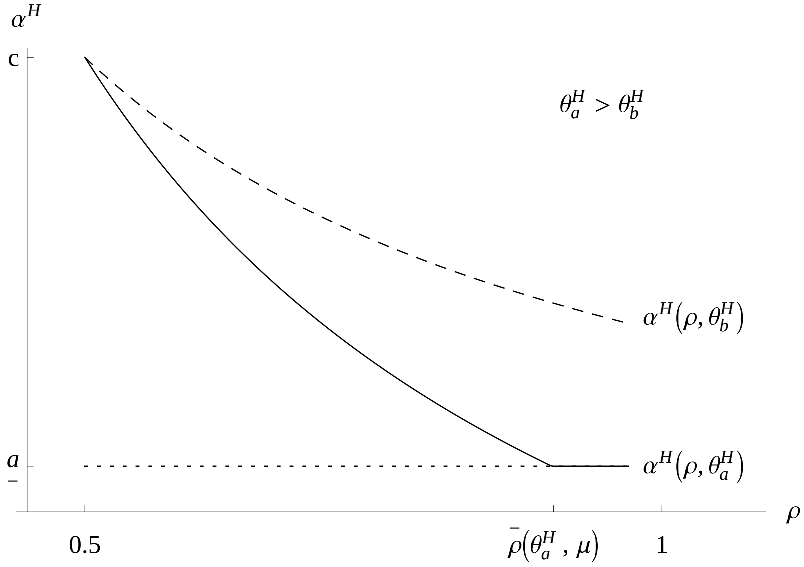

Figure 1: The effect of power concentration on candidate behavior. *Parameters: uniform ability distribution, c=0.6, μ=0.8, θ_a^H=1, θ_b^H=0.6.*

For a large conflict of interest, $\theta^H \geq \bar{\theta}(\mu)$, egoistic candidates care more strongly for the spoils of office. Correspondingly, they are willing to take more excessive policy risks if this allows them to achieve more power. If power is strongly concentrated (ρ close to 1), the election winner receives a much higher share of the spoils of office than the election loser. Hence, egoistic candidates find it so attractive to increase their electoral prospects through reform proposals that the cutoff α^H is reduced to its lower bound $\underline{a}$. Put differently, high levels of power concentration induce type II equilibria. With strongly dispersed power (ρ close to $\frac{1}{2}$), in contrast, the election winner and the election loser receive almost the same power. Therefore, egoistic candidates can hardly gain spoils of office by proposing a reform. Hence, they are not willing to accept the expected loss in legacy payoff that follows from excessively risky reforms. As a result, the cutoff α^H is close to its efficient level c, and the equilibrium is of type I. Whenever $\theta^H \geq \bar{\theta}(\mu)$, there exists a unique threshold $\bar{\rho}(\theta^H, \mu)$ such that a type I equilibrium arises for all lower levels of power concentration, while a type II equilibrium results for all higher levels (see solid line in Figure 1).

7.2 Effects on welfare

Finally, we assess the performance of power-concentrating institutions by studying their effects on voter welfare. We start by explaining how the candidates' policy proposals enter expected voter welfare. Suppose candidate 1 with type (a_1, θ_1) proposes policy x_1. Her contribution to voter welfare is then given by her expected power multiplied by the expected payoff from her policy per unit of power,

$$E\left[\pi_1(w,\rho)\,|x_1, X_2(a_2,\theta_2), s\right]\ x_1\ \ (a_1-c)\,,$$

where the expectation in the first term is taken over the characteristics of the second candidate, a_2 and θ_2. This welfare contribution is equal to zero if candidate 1 proposes the status quo, $x_1 = 0$. Consequently, voter welfare is equal to the sum of welfare contributions by the reforming candidates only. Recall that the winning probability of all reforming candidates is identical. In the following, we denote this probability by $s^R > 1/2$. The expected power of each reforming candidate is hence given by $s^R\rho + (1-s^R)(1-\rho)$, independent of his type. In contrast, the expected policy payoff depends on the candidate's ability a_i.

Summing over both candidates and all types, voter welfare thus follows as

$$W(\rho) = 2\left[s^R\rho + (1-s^R)(1-\rho)\right] B(\alpha^H)\,, \tag{9}$$

where the second term sums up the expected policy payoffs from all reforming types, given the equilibrium strategy $X^*(a,\theta)$,

$$B(\alpha^H) := \mu\int_{\alpha^H}^{1}\phi(a)(a-c)da + (1-\mu)\int_{c}^{1}\phi(a)(a-c)da\,.$$

It proves useful to divide the marginal welfare effect of an increase in power concentration into three partial effects with meaningful economic interpretations.

$$\frac{dW}{d\rho} = \underbrace{\frac{\partial W}{\partial \rho}}_{\text{empowerment effect}} + \underbrace{\frac{\partial W}{\partial B(\alpha^H)}\cdot\frac{\partial B(\alpha^H)}{\partial \alpha^H}\cdot\frac{d\alpha^H}{d\rho}}_{\text{disciplining effect}} + \underbrace{\frac{\partial W}{\partial s^R}\cdot\frac{ds^R}{d\rho}}_{\text{selection effect}} \tag{10}$$

First, there is a direct effect of an increase in ρ on welfare: Holding behavior of political candidates and the voter fixed, some political power is shifted from the election loser to the election winner. This improves welfare as the voter rationally opts for the candidate who provides larger expected welfare.[18] Hence, there is a positive *empowerment effect.*

Second, a change in political institutions affects the behavior of politicians. As shown in Lemma 1, a higher level of ρ reduces the cutoff α^H, i.e., induces more egoistic candidates to choose inefficient policy gambles.[19] This in turn reduces the

[18] Formally, the winning probability of reforming candidates is given by $s^R > 1/2$. Together with $B(\alpha^H) > 0$, this ensures a strictly positive partial derivative $\frac{\partial W}{\partial \rho}$.

[19] Formally, the equilibrium cutoff α^H decreases, adding additional negative terms in the first integral of term $B(\alpha^H)$.

sum of expected policy payoffs $B(\alpha^H)$ and thus leads to a reduction in voter welfare: there is a negative *disciplining effect*.

Third, the increased gambling impedes the voter's ability to select well-suited candidates for office. In particular, the voter cannot discriminate between beneficial reforms proposed by high-ability candidates and detrimental reforms proposed by low-ability candidates. Hence, the marginal candidates switching to a reform proposal are elected more often than before, and all other candidates are elected less often. In particular, this lowers the winning probability s^R of each candidate who initially proposed a reform. As the marginal candidates provide lower policy payoffs than all other candidates, voter welfare is unambiguously reduced: there is a negative *selection effect*.

Overall, variations in power concentration give rise to a tradeoff between the positive *empowerment effect* on the one hand, and the negative *disciplining* and *selection effects* on the other hand. The optimal level of power concentration can be found by studying the relative sizes of these countervailing effects over the range of institutional settings, $\rho \in \left[\frac{1}{2}, 1\right]$. As will become clear, the sum of all three effects may be non-monotonic in ρ. The following assumption on the joint type distribution ensures that there is a unique welfare maximum, nevertheless. Therefore, it allows to focus on the underlying mechanism of interest. We impose this assumption for the remainder of the paper.

Assumption 3. *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 many commonly used probability distributions, including the uniform distribution, the normal distribution, and the Pareto distribution. It implies that the weighted ability distribution has a non-decreasing hazard rate $K(a)/k(a)$.[20] Under this regularity condition, we get the following results on the optimal level of power concentration.

Proposition 4. *Let Assumptions 1, 2 and 3 be satisfied. There is a strictly decreasing function* $\tilde{\theta}(\mu) < \bar{\theta}(\mu)$ *such that full concentration of power is optimal if and only if* $\theta^H < \tilde{\theta}(\mu)$, *i.e., the conflict of interest is sufficiently small. Otherwise, voter welfare is maximized at a unique intermediate level of power concentration,* $\rho^* \in \left(\frac{1}{2}, 1\right)$.

[20] Note that log-concavity is usually imposed on the unweighted ability distribution $\Phi(a)$. We slightly generalize this regularity assumption by imposing it on the weighted ability distribution. For the uniform distribution and any distribution with decreasing density ϕ, Assumption 3 follows from log-concavity of Φ.

By Proposition 4, the optimal level of power concentration ρ^* is uniquely determined for each combination of μ and θ^H. In particular, ρ^* is given by full concentration of power if and only if the conflict of interest between the voter and the candidates is small. This result can be derived in three main steps. First, the optimal level of power concentration has to induce a type I equilibrium. Second, welfare is strictly quasi-concave in ρ within the range of parameter values giving rise to a type I equilibrium. Hence, the optimal level of power concentration is well-defined and unique. Third, full concentration of power is optimal if and only if the conflict of interest is sufficiently small. Otherwise, some intermediate level of power concentration is optimal.[21]

The first step follows because the voter is strictly better off in each type I equilibrium than in any type II equilibrium. In type I equilibria, the expected payoff $B(\alpha^H)$ from proposed reforms is strictly positive as argued above. The same is true for expected voter welfare, as can be seen in equation (9). In type II equilibria, on the contrary, politicians propose so many detrimental reforms that the expected reform payoff and expected welfare are equal to zero. To ensure a type I equilibrium, the optimal level of power concentration ρ^* must be located below the threshold $\bar{\rho}(\theta^H, \mu)$, which we have established in Proposition 3.

In the second step, we show that welfare is strictly quasi-concave over the range of type I equilibria under Assumption 3. For this purpose, we analyze how the sizes of the three welfare effects evolve with ρ. We start with the positive empowerment effect, which results because additional power is shifted to the election winner, who is likely to be a reforming candidate. The higher ρ is, the more detrimental reforms are proposed and the lower is the expected reform payoff $B(\alpha^H)$, which makes shifting power to reforming candidates less beneficial. Hence, the empowerment effect is large for ρ close to 1/2, but shrinks with increasing power concentration.[22]

Next, consider the negative disciplining effect, which results because additional political candidates propose detrimental reforms. The size of this effect depends on the expected payoff from these marginal reforms, $\mu\phi(\alpha^H)\left(\alpha^H - c\right)$. For low levels of power concentration, policy choice is almost efficient with α^H close to c. The higher ρ is, the more distorted is policy choice and the more detrimental are the marginal reforms. Hence, the disciplining effect is negligible for ρ close to 1/2, but

[21]Note that full dispersion of political power (random allocation of decision rights) is never optimal, but always dominated by some level of intermediate power concentration. This finding qualifies the result of Maskin & Tirole (2004) who show that, under some conditions, political decisions should rather be delegated to randomly appointed "judges" than to elected "politicians".

[22]If high levels of ρ push the cutoff α^H towards its lower bound $\underline{a}$, the empowerment effect vanishes completely: Shifting power to reforming candidates is not beneficial anymore.

grows larger for strongly concentrated power.[23]

Finally, the negative selection effect arises because the winning probability s^R of reforming candidates is reduced. First, the size of this effect depends on how strongly the winning probability affects the expected power of reforming candidates. If ρ is small, the election winner and the loser receive almost the same power shares. Therefore, a change in s^R has only little impact on voter welfare and the selection effect is weak. Second, the size of the effect depends on how beneficial it is to shift additional power to reforming candidates, i.e., how large their welfare contribution $B(\alpha^H)$ is. As argued above, $B(\alpha^H)$ decreases in ρ. Consequently, the selection effect is also weak for high levels of ρ. While the selection effect is thus close to zero for low levels and high levels of ρ, it attains more negative values for intermediate levels of power concentration. Hence, this effect is in general non-monotonic in ρ.

The previous discussion has provided two insights that are illustrated in Figure 3 in Appendix B. First, the positive empowerment effect always dominates for small levels of ρ, but may be dominated by the negative disciplining and selection effects for high levels of ρ. Second, the selection effect is in general non-monotonic in ρ. Assumption 3 ensures that the welfare function has a unique and well-defined maximum, nevertheless. In particular, the assumption requires a monotonically decreasing hazard rate $\frac{K(a)}{k(a)}$. Thereby, it imposes restrictions on how changes in α^H affect the share of reforming candidates, $1 - K(\alpha^H)$, relative to the density of marginal candidates, $k(\alpha^H)$. While the share of reforming candidates is crucial for the expected payoff from all reforms $B(\alpha^H)$ (which enters the empowerment and selection effects), the density of marginal candidates shapes the disciplining effect. As a result, the negative and positive effects outbalance each other at most at one level of ρ (see formal proof of Proposition 4). Put differently, expected welfare is strictly quasi-concave in ρ and has a unique maximum $\rho^* \in (1/2, 1]$.

Whether the maximum is given by some intermediate level of power concentration $\rho < 1$ or by full power concentration $\rho = 1$, depends on the conflict of interest as measured by θ^H and μ. Figure 2 illustrates this relation by depicting the welfare functions for three different conflicts of interests. If the conflict of interest is large, full concentration of power induces a type II equilibrium with zero welfare. Hence, it is optimal to set an intermediate level of $\rho < \bar{\rho}\left(\theta^H, \mu\right)$ that is sufficiently small to ensure a type I equilibrium (see solid line in Figure 2). If the conflict of interest is moderate, full concentration of power gives rise to a type I equilibrium with cutoff α^H close to its lower bound $\underline{a}$. In this case, the expected reform payoff $B(\alpha^H)$ is so

[23] Whether or nor the disciplining effect is monotonic in ρ, depends on the gradients of the density function ϕ and the derivative $\frac{d\alpha^H}{d\rho}$.

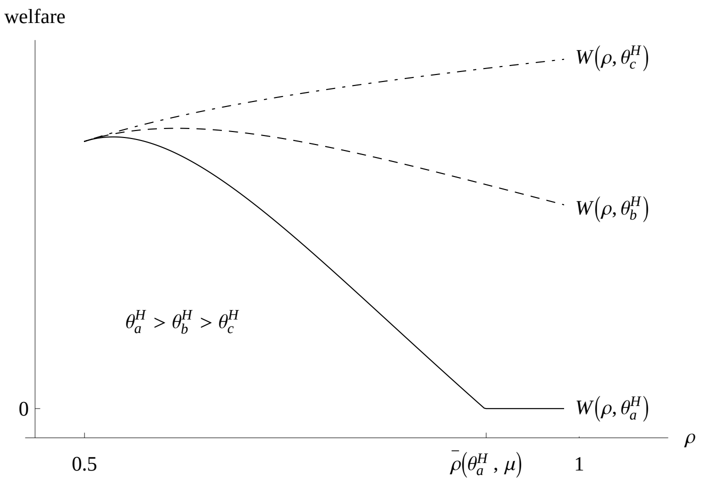

Figure 2: The effect of power concentration on welfare. *Parameters: uniform ability distribution,* c *=0.6,* μ*=0.8,* θ_a^H *=1,* θ_b^H *=0.6,* θ_c^H *=0.3.*

small that the positive empowerment effect is dominated by the negative disciplining and selection effects. Consequently, voter welfare can be increased by introducing some dispersion of power (see dashed line in Figure 2). If the conflict of interest is small, finally, full power concentration induces only limited policy gambles so that α^H remains close to its efficient level c. In this case, the overall effect is positive for all levels of ρ: it is optimal to fully concentrate power in the hands of the election winner (see dot-dashed line in Figure 2).

Finally, we investigate how the optimal level of power concentration is affected by a marginal reinforcement in the conflict of interest between voter and politicians. In our setting, the conflict of interest is affected by two parameters, the strength of the office motive θ^H and the share of egoistic candidates μ. Recall that full power concentration is optimal if the conflict of interest is sufficiently small, $\theta^H \leq \tilde{\theta}(\mu)$. The following corollary considers marginal variations in both parameters in all other cases.

Corollary 2. *Let Assumptions 1, 2 and 3 be satisfied. If* $\theta^H > \tilde{\theta}(\mu)$*, the optimal level of power concentration is strictly decreasing in* θ^H *as well as* μ*.*

By Corollary 2, optimal power concentration is unambiguously decreasing in the size of the conflict of interest. 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 disciplining and selection effects of power concentration. Thus, it becomes more beneficial to reduce these distortions by means of power-dispersing institutions.

In Appendix C, we show that our theoretical results are in line with some illustrative data. For this purpose, we assume that real-world institutions have not been chosen optimally according to our model, but for idiosyncratic (e.g., historical) reasons outside of our model. Under this assumption, Corollary 2 suggests that countries with a weak conflict of interest between politicians and voters should experience a positive welfare effect of power concentration. In contrast, countries with a stronger conflict of interest should experience a smaller or even negative welfare effect of power concentration. While a rigorous empirical test is beyond the scope of this paper, we can operationalize key variables of our model for a cross-country set of 18 established democracies. We find that the data is broadly in line with the conjecture: For countries where voters evaluate politicians as mainly public-spirited, power concentration is positively correlated with economic growth (as a broad performance measure). For countries where voters assess politicians as mainly egoistic, in contrast, power concentration and growth are negatively correlated.

8 Conclusion

In this paper, we have investigated how the concentration of political power affects policy choice and political selection. In particular, we have considered a model in which politicians propose overly risky policies to appear more competent and increase their electoral prospects. In this setting, power-concentrating institutions induce three effects on voter welfare. On the one hand, they shift additional power to the voter's preferred candidate, giving rise to a positive *empowerment effect*. On the other hand, they induce the adoption of more inefficiently risky policies and reduce the voter's capability to identify well-suited candidates, giving rise to negative *selection* and *disciplining effects*. If and only if the conflict of interest between voter and politicians is small, it is optimal to concentrate political power fully in the hands of the election winner. The larger the conflict of interest, the more power should be dispersed in order to maximize voter welfare.

While we have focused on a stylized model with a representative voter above, our results extend to a more general model with heterogeneous voters. This general model also allows to show that power dispersion can increase welfare through two separate channels. As shown in the present paper, it helps to reduce the adoption of inefficient risk-taking due to a selection problem. Additionally, power dispersion can promote the adoption of compromising policies, thereby fostering the political representation of minorities and preventing a tyranny of the majority.[24]

[24]See Grunewald et al. (2017) for a detailed discussion of the setting with heterogeneous voters.

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Appendix

A Proofs of Propositions and Lemmas

Proof of Proposition 1

Proof. Under perfect information, the voter can directly compare the expected payoffs from both candidates' proposals. Hence, his optimal strategy is to choose $s(x_1, x_2) = 1$ if $x_1\,(a_1 - c) > x_2\,(a_2 - c)$ and $s(x_1, x_2) = 0$ if $x_1\,(a_1 - c) < x_2\,(a_2 - c)$. Denote by

$$E\left[\pi_1(w, \rho)\right] = E_{a_2,\theta_2}[\rho\ s(x_1, X_2(a_2, \theta_2)) + (1 - \rho)(1 - s(x_1, X_2(a_2, \theta_2)))]$$

the expected power of candidate 1, given s and candidate 2's strategy. $E\left[\pi_1(\cdot)\right]$ is monotonically increasing in x_1 for $a_1 > c$ and monotonically decreasing in x_1 for $a_1 < c$. Candidate 1 chooses x_1 to maximize $E\left[\pi_1(w, \rho)\right]\ \left[x_1(a_1 - c) + \theta_1\right]$. For $a_1 > c$, a full reform $x_1 = 1$ maximizes both her expected power $E[\pi_1(\cdot)]$ and the expected policy payoff $x_1\,(a_1 - c)$. For $a_1 < c$, in contrast, the status $x_1 = 0$ maximizes her winning probability as well as the expected policy payoff. Note that $x_1 = 0$ is the unique optimal action because it leads to a strictly positive winning probability against any opponent with $a_2 < c$.

As shown above, changes in ρ do 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 whose expected policy payoff is higher. Hence, voter welfare strictly increases with the level of power concentration. □

Proof of Proposition 2 and Corollary 1

We prove Proposition 2 and Corollary 1 through a series of Lemmas. Lemma 2 shows that the candidates' policy preferences satisfy the Gans & Smart (1996) single-crossing property. Lemma 3 characterizes the strategies in any PBE. Lemma 4 identifies equilibria that are robust to D1 and unprejudiced beliefs. Lemma 5 proves the existence of a unique D1 equilibrium, which is symmetric.

Lemma 2. *Fix $\theta^H > \theta^L > 0$, the voter's strategy s and the strategy X_{-i} of candidate $-i$. Denote by $\hat{\pi}_i(x)$ the expected power of candidate i for proposal x, given s and X_{-i}. Consider two actions x_a and $x_b > x_a$ such that $\hat{\pi}_i(x_a) > 0$, $\hat{\pi}_i(x_b) > 0$.*

(i) If i weakly prefers x_b to x_a for some type (a', θ^j) such that $\theta^j + x_b(a' - c) > 0$, then i strictly prefers x_b to x_a for any type (a'', θ^j) with $a'' > a'$.

(ii) If i weakly prefers x_a to x_b for some type (a', θ^j) such that $\theta^j + x_a(a' - c) > 0$, then i strictly prefers x_a to x_b for any type (a'', θ^j) with $a'' < a'$ and $\theta^j + x_a(a'' - c) > 0$.

Proof. For any action x, we denote candidate i's expected utility by $\hat{u}_i(x, a, \theta^j) := \hat{\pi}_i(x) \left[\theta^j + x(a-c)\right]$. For part (i), she weakly prefers x_b to x_a for type (a', θ^j) if $\hat{u}_i(x_b, a', \theta^j) \geq \hat{u}_i(x_a, a', \theta^j)$, which is equivalent to

$$\frac{\hat{\pi}_i(x_b)}{\hat{\pi}_i(x_a)} \geq \frac{\theta^j + x_a(a'-c)}{\theta^j + x_b(a'-c)} \ .$$

Whenever $x_b > x_a$, the right-hand side of this inequality is strictly decreasing in a'. Hence, for any $a'' > a'$, the strict inequality $\hat{u}_i(x_b, a'', \theta^j) > \hat{u}_i(x_a, a'', \theta^j)$ is satisfied, i.e., i strictly prefers x_b to x_a.

For part (ii), let $\theta^j + x_a(a'-c) > 0$. Then, i weakly prefers x_a to x_b for type (a', θ^j) if

$$\frac{\hat{\pi}_i(x_a)}{\hat{\pi}_i(x_b)} \geq \frac{\theta^j + x_b(a'-c)}{\theta^j + x_a(a'-c)} \ .$$

Whenever $x_b > x_a$, the right-hand side of this inequality is strictly increasing in a'. Hence, for any $a'' < a'$ such that $\theta^j + x_a(a''-c) > 0$, the strict inequality $\hat{u}_i(x_a, a'', \theta^j) > \hat{u}_i(x_b, a'', \theta^j)$ is satisfied, i.e., i strictly prefers x_a to x_b. $\square$

Lemma 3. *Assume that Assumption 1 holds and that $\theta^H > \theta^L > 0$. In every PBE, the equilibrium strategy X_i^* of candidate i satisfies the following properties:*

(i) $X_i^*(a, \theta) = 0$ for a subset of types with strictly positive probability mass.

(ii) $X_i^*(a, \theta)$ is monotonically increasing in a.

(iii) There is a policy $\tilde{x}_i \in [0, 1]$ such that $X_i^*(a, \theta) = \tilde{x}_i$ for all $a \geq c$.

(iv) There are two cutoffs $\alpha_i^L \in (0, c)$ and $\alpha_i^H \in (0, c)$ and a policy $\tilde{x}_i \in [0, 1]$ such that

$$X_i^*(a, \theta^j) = \begin{cases} 0 & \text{if} \quad a < \alpha_i^j \text{ and } \theta = \theta^j, \\ \tilde{x}_i & \text{if} \quad a \geq \alpha_i^j \text{ and } \theta = \theta^j \ . \end{cases} \tag{A.1}$$

Proof. For part (i), denote by $\hat{a}_i(x)$ the expected ability and by $\hat{v}_i(x) =: x\left[\hat{a}_i(x) - c\right]$ the expected policy payoff of agents proposing x. Assume there is a PBE with strategies (X_1^*, X_2^*) such that candidate 1 does not play $x_1 = 0$ for any type. Recall that the expected ability $E[a]$ is below c by Assumption 1. Then, there are a policy $x' > 0$ and a type (a_1, θ_1) with $a_1 < c$ such that $X_1^*(a_1, \theta_1) = x' > 0$, $\hat{a}_1(x') < c$ and $\hat{v}_1(x') < 0$. For this type, the expected utility is given by $\hat{u}(x', a_1, \theta_1) = \hat{\pi}_1(x')\left[\theta_1 + x'(a_1 - c)\right]$, where $\hat{\pi}_1(x')$ follows from the voter's optimal strategy, given correct beliefs about $\hat{v}_1(x') < 0$. Assume that type (a_1, θ_1) deviates from x' to a status quo proposal $x_1 = 0$, thereby increasing the voter's expected policy payoff to $\hat{v}_1(0) = 0 > \hat{v}_1(x')$. Given unprejudiced beliefs, the voter prefers candidate 1 weakly more often so that $\hat{\pi}_1(0) \geq \hat{\pi}_1(x')$. Note also that $\hat{\pi}_1(0)$ is strictly positive, because 1 wins with positive probability whenever $\hat{v}_2(x_2) < 0$ or

$x_2 = 0$ (by the tie-breaking rule $s(0,0) = 1/2$). Hence, the deviation to $x_1 = 0$ is strictly profitable. But then, the initial strategy X_1^* cannot be part of a PBE. We conclude that candidate 1 plays $x_1 = 0$ with strictly positive probability in every PBE.

For part (ii), assume that $X_i^*(a, \theta^j) = x'$ for candidate i given some type (a, θ^j). Her utility $\hat{u}_i(x', a, \theta^j) = \hat{\pi}_i(x')\left[\theta^j + x'(a-c)\right]$ must be weakly larger than $\hat{u}(0, a, \theta^j) = \hat{\pi}_i(0)\theta^j > 0$, where $\theta^j > 0$ by assumption and $\hat{\pi}_i(0) > 0$ by part (i). Hence, the conditions $\pi_i(x) > 0$ and $\theta_j + x(a-c) > 0$ are satisfied for (x', a, θ^j) and the single-crossing condition established in Lemma 2 (i) holds for each pair of equilibrium actions. Thus, $X_i^*(a, \theta)$ is monotonically increasing in a in every PBE.

For part (iii), the expected utility of candidate i with type (c, θ) is given by $\hat{u}_i(x, c, \theta) = \hat{\pi}_i(x)\theta$. Hence, $X_i^*(c, \theta)$ is equal to a maximizer $\tilde{x}_i$ of $\hat{\pi}_i(x)$ for each $\theta \in \{\theta^L, \theta^H\}$. Assume for now that $\tilde{x}_i$ is the unique maximizer of $\hat{\pi}_i(x)$, and that there is a policy $x' \neq \tilde{x}_i$ such that $X_i^*(1, \theta^j) = x'$ for at least one $j \in \{L, H\}$. By part (ii), we must have $x' > \tilde{x}_i$. Moreover, there must exist a cutoff $\tilde{\alpha}_i^j \in (c, 1]$ such that $X_i^*(a, \theta^j) = x'$ for all $a > \tilde{\alpha}_i^j$. If $X_i^*(1, \theta^{-j}) = x'$ as well, there must be another cutoff $\tilde{\alpha}_i^{-j} \in (c, 1)$ such that $X_i^*(a, \theta^{-j}) = x'$ for all $a > \tilde{\alpha}_i^{-j}$. In any case, we have $\hat{v}_i(x') > \hat{v}_i(\tilde{x}_i)$, which implies that $\hat{\pi}_i(x') > \hat{\pi}_i(\tilde{x}_i)$. Hence, we have a contradiction: $\tilde{x}_i$ does not maximize $\hat{\pi}_i(x)$.

Next, assume that both $\underline{x}$ and $\bar{x} > \underline{x}$ are maximizers of $\hat{\pi}_i(x)$. Then, candidate i is indifferent between $\underline{x}$ and $\bar{x}$ for type (c, θ). By Lemma 2, i strictly prefers $\bar{x}$ to $\underline{x}$ for each $a_i > c$, while she strictly prefer $\underline{x}$ for all $a_i < c$. Consequently, there must be a policy $x' \geq \bar{x}$ that is only proposed by candidates with expected ability above c and, correspondingly, gives a strictly positive expected payoff $\hat{v}_i(x')$. In contrast, policy $\underline{x}$ is only proposed by candidates with expected ability below c and, correspondingly, gives a weakly negative payoff. But then, x' must give a strictly larger power than $\underline{x}$, i.e., the latter cannot be a maximizer of $\hat{\pi}_i(x)$. We conclude that there is a unique maximizer $\tilde{x}_i$, which is proposed by i given ability c as well as ability 1. By the monotonicity established in part (ii), $X_i^*(a_i, \theta^j) = \tilde{x}_i$ for each $a_i \geq c$ and each $j \in \{L, H\}$.

For part (iv), recall that candidate i proposes the actions 0 and $\tilde{x}_i = \arg\max \hat{\pi}(x)$ along the equilibrium path, and that $\hat{\pi}_i(0) > 0$. Assume that $X_i^*(a', \theta^j) = x' \notin \{0, \tilde{x}_i\}$ for some ability a' and some $j \in \{L, H\}$. By part (iii), x' can only be proposed by a subset of types with $a < c$. Hence, the expected policy payoff from x' must be negative, $\hat{v}_i(x') < 0$, which also implies that $\hat{\pi}_i(x') < \hat{\pi}_i(0)$ in every PBE. But then, as explained in part (i), a deviation from x' to 0 is profitable for type (a', θ^j). Hence, only the policies 0 and $\tilde{x}_i$ are proposed along the equilibrium path. By part (ii), there must be two cutoffs α^L and α^H such that $X_i^*(a, \theta^j)$ is equal to 0 for all (a, θ^j) with $a < \alpha^j$, and equal to $\tilde{x}_i$ for all (a, θ^j) with $a \geq \alpha^j$. By parts (i) and (iii), both cutoffs are located in $(0, c)$. □

Lemma 4. *Assume that Assumption 1 holds and that $\theta^H > \theta^L > 0$. In every D1 equilibrium, $X_i^*(1, \theta^j) = 1$ for each $j \in \{L, H\}$ and each $i \in \{1, 2\}$.*

Proof. The following proof shows that, first, PBE equilibria with $X_i^*(1, \theta^j) = 1$ are robust to D1 and, second, PBE equilibria with $X_i^*(1, \theta^j) = \tilde{x}_i < 1$ are not robust to D1. The D1 criterion restricts the set of viable beliefs off the equilibrium path (Cho & Kreps 1987). Essentially, D1 says that a deviation of agent i to some action ε cannot be assigned to type (a, θ) if there is another type (a', θ') with the following properties: For every potential best response s by the voter such that a deviation to ε is weakly profitable for (a, θ), the deviation is strictly profitable for (a', θ'). In our setting, the strategy of the voter affects the candidates only through its impact on their expected political power $\hat{\pi}_i(\varepsilon)$. To apply D1, it therefore suffices to consider the set of viable levels of $\hat{\pi}_i(\varepsilon) \in [1-\rho, \rho]$.

First, we show that each PBE equilibrium with $X_i^*(1, \theta^j) = 1$ is robust to D1. Consider a deviation from $X_i^*(a, \theta^j) \in \{0, 1\}$ to $\varepsilon \in (0, 1)$. The deviation gives utility $\hat{u}_i(\varepsilon, a, \theta^j) = \hat{\pi}_i(\varepsilon) \left[\theta^j + \varepsilon(a-c)\right]$, while $\hat{u}_i(X_i^*(a, \theta^j), a, \theta^j) \geq \hat{u}_i(0, a, \theta^j) = \hat{\pi}_i(0)\ \theta^j > 0$. Hence, the deviation can only be profitable for (a, θ^j) if $\hat{\pi}_i(\varepsilon) > 0$ and $\theta^j + \varepsilon(a-c) > 0$. Thus, we can exploit the single-crossing property established in Lemma 2, using $0 < \varepsilon < 1$. Consider a type (a, θ^j) such that a is below the cutoff α_i^j and $X_i^*(a, \theta) = 0$ (see Lemma 3). By Lemma 2 (i), for any $\hat{\pi}_i(\varepsilon)$ such that (a, θ^j) weakly prefers ε to 0, any type (a', θ^j) with $a' \in (a, \alpha_i^j)$ strictly prefers ε to 0. Hence, we cannot assign the deviation to a type with $a < \alpha_i^j$. Consider a type (a, θ^j) such that $a > \alpha_i^j$ and $X_i^*(a, \theta) = 1$. For any such type, we have $\theta^j + 1(a-c) > 0$, which also ensures that $\theta^j + \varepsilon(a-c) > 0$. We can hence apply Lemma 2 (ii): For any $\hat{\pi}_i(\varepsilon)$ such that (a, θ^j) weakly prefers ε to 1, any type (a', θ^j) with $a' \in (\alpha_i^j, a)$ strictly prefers ε to 1. Hence, we cannot assign the deviation to a type with $a > \alpha^j$. As a result, D1 requires that any deviation from the equilibrium actions 0 or 1 to some $\varepsilon \in (0, 1)$ is associated to one of the cutoff types (α_i^L, θ^L) or (α_i^H, θ^H). For these cutoff types, a deviation is profitable whenever $\hat{\pi}_i(\varepsilon) \geq \hat{\pi}_i(1) \in [1-\rho, \rho]$. Hence, the set of voter responses such that the deviation is profitable is non-empty. In both cases, because $\alpha_i^L < c$ and $\alpha_i^H < c$, the D1 beliefs imply an expected payoff $\hat{v}_i(\varepsilon) < 0$ and, hence, $\hat{\pi}_i(\varepsilon) < \hat{\pi}_i(0) < \hat{\pi}_i(1)$. Given these beliefs, the deviation is not profitable for any type because $\hat{u}(\varepsilon, \alpha_i^j, \theta^j) < \hat{u}(0, \alpha_i^j, \theta^j) = \hat{u}(1, \alpha_i^j, \theta^j)$ for $j \in \{L, H\}$.

Second, we show that PBE with $X_i^*(1, \theta^j) = \tilde{x}_i < 1$ are not robust to D1. Consider a PBE with $\tilde{x}_i \in [0, 1)$ and a deviation to $x_i = 1$, giving utility $\hat{u}_i(1, a, \theta^j) = \hat{\pi}_i(1) \left[\theta^j + a - c\right]$. Again, the deviation can only be profitable for (a, θ^j) if $\hat{\pi}_i(1) > 0$ and $\theta^j + a - c > 0$. Thus, we can exploit the single-crossing property, using $1 > \tilde{x}_i \geq 0$. By Lemma 2 (i), for any $\hat{\pi}_i(1)$ such that (a, θ^j) weakly prefers 1 to 0, any type (a', θ^j) with $a' > a$ strictly prefers 1 to 0. Moreover, for any $\hat{\pi}_i(1)$ such that (a, θ^j) weakly prefers 1 to $\tilde{x}_i$, any type (a', θ^j) with $a' > a$ strictly prefers 1 to $\tilde{x}_i$. Hence, D1 requires that the voter assigns the deviation to 1 to a type $(1, \theta^j)$ with $j \in \{L, H\}$. For such a type, the expected policy payoff $\hat{v}_i(1) = 1-c$ is strictly larger than $\hat{v}_i(\tilde{x}_i) = \tilde{x}_i[\hat{a}_i(\tilde{x}_i) - c]$ and, hence, gives higher expected power $\hat{\pi}_i(1) > \hat{\pi}_i(\tilde{x}_i)$. Hence, the deviation from $\tilde{x}$ to 1 increases i's office rents as well as her legacy payoff and is thus strictly profitable for type $(1, \theta^j)$ and $j \in \{L, H\}$. As a result, the PBE with $\tilde{x}_i \in [0, 1)$ is not robust to D1. $\square$

Lemma 5. *Assume that Assumptions 1 and 2 hold and that $\theta^L \to 0$.*

(i) In every D1 equilibrium, $\alpha_1^L = \alpha_2^L = c$.

(ii) There is a unique symmetric D1 equilibrium with either $\alpha_1^H = \alpha_2^H \in (\underline{a}, c)$ and $s_{10} = 1$, or $\alpha_1^H = \alpha_2^H = \underline{a}$ and $s_{10} \in (1/2, 1]$.

(iii) If $s(0,0) = 1/2$, there exists no asymmetric equilibrium with $\alpha_1^H \neq \alpha_2^H$.

Proof. Assume that there is a D1 equilibrium. By Lemmas 3 and 4, there is a unique cutoff $\alpha_i^j \in (0, c)$ such that a candidate with type (a, θ^j) prefers $x_i = 1$ to $x_i = 0$ if and only if a is above a threshold α_i^j. For each $j \in \{L, H\}$, the threshold α_i^j is defined by the indifference condition

$$\hat{u}_i(1, \alpha^j, \theta^j) - \hat{u}_i(0, \alpha^j, \theta^j) = [\hat{\pi}_i(1) - \hat{\pi}_i(0)]\,\theta^j + \hat{\pi}_i(1)(\alpha^j - c) = 0\ . \tag{A.2}$$

For part (i), consider the limit case $\theta^L \to 0$ and recall that $\hat{\pi}_i(1) \geq \hat{\pi}_i(0) > 0$. For $j = L$, indifference condition (A.2) is satisfied if and only if $\alpha^L = c$. This implies that candidate i proposes the status quo with probability $K(\alpha_i^H) = \mu\Phi(\alpha_i^H) + (1-\mu)\Phi(c)$, and a reform with probability $1 - K(\alpha_i^H)$.

Part (ii) proves the existence and uniqueness of a symmetric D1 equilibrium and, at the same time, Corollary 1. In any symmetric equilibrium, we have $\alpha_1^L = \alpha_2^L = c$, $\alpha_1^H = \alpha_2^H = \alpha$, $s(1,1) = s(0,0) = 1/2$ and $s(1,0) = 1 - s(0,1) = s_{10}$. Ex ante, candidate i proposes the reform with probability $K(\alpha) = \mu\Phi(\alpha) + (1-\mu)\Phi(c)$. The expected power shares for both possible actions follow as

$$\begin{aligned}
\hat{\pi}_i(1) &= K(\alpha)\,\{s_{10}\rho + (1 - s_{10})(1-\rho)\} + [1 - K(\alpha)]\,\frac{1}{2} = \frac{1}{2} + K(\alpha) g(\rho, s_{10})\ , \\
\hat{\pi}_i(0) &= K(\alpha)\frac{1}{2} + [1 - K(\alpha)]\,\{(1 - s_{10})\rho + s_{10}(1-\rho)\} = \frac{1}{2} - [1 - K(\alpha)]\,g(\rho, s_{10})\ ,
\end{aligned}$$

with the difference $\hat{\pi}_i(1) - \hat{\pi}_i(0)$ being equal to $g(\rho, s_{10}) = 2(\rho - \frac{1}{2})(s_{10} - \frac{1}{2})$. In symmetric equilibria, the indifference condition (A.2) hence boils down to (8), i.e.,

$$R(\alpha, s_{10}, \rho) = \hat{u}_i(1, \alpha, \theta^H) - \hat{u}_i(0, \alpha, \theta^H) = g(\rho, s_{10})\theta^H + \left[\frac{1}{2} + K(\alpha) g(\rho, s_{10})\right](\alpha - c) = 0\ .$$

Next, identify the viable combinations of α and s_{10}. The equilibrium value of s_{10} depends on the expected ability $\hat{a}_i(1)$ for a reform proposal, which is determined by the cutoff α. For $\alpha > \underline{a}$, $\hat{a}_i(1)$ is larger than c, so that s_{10} must equal 1. For $\alpha = \underline{a}$, $\hat{a}_i(1)$ is equal to c, so that any $s_{10} \in [0, 1]$ is viable. For $\alpha < \underline{a}$, s_{10} is equal to 0.

We are now able to show that there is a unique symmetric equilibrium, which is either of type I or type II. This also proves Corollary 1. We exploit that R is continuous and monotonically increasing in s_{10} and, by Assumption 2, in α. For any $\rho \in (1/2, 1]$, $R(\underline{a}, 1/2, \rho) = (\underline{a} - c)/2 < 0$ and $R(c, 1, \rho) = g(\rho, s_{10})\theta^H > 0$. For any $\rho \in (1/2, 1]$, there is hence a unique equilibrium (α, s_{10}) that satisfies $R(\alpha, s_{10}, \rho) = 0$. This equilibrium is of type I with $\alpha \in (\underline{a}, c)$ and $s_{10} = 1$ if $R(\underline{a}, 1, \rho) < 0$. It is of type II with $\alpha = \underline{a}$ and

$s_{10} \in (1/2, 1]$ if $R(\underline{a}, 1, \rho) \geq 0$. For $\rho = 1/2$, we have $g(1/2, s_{10}) = 0$ and equilibrium behavior is given by $\alpha = c$ and $s_{10} = 1$. Note also that there cannot be equilibria with $\alpha < \underline{a}$. In this case, s_{10} would be equal to 0, so that a reform proposal would give a smaller expected power than the status quo. But then, α must be located above c, which contradicts the assumption that $\alpha < \underline{a}$.

For part (iii), assume without loss of generality that there is an equilibrium with $\alpha_1^H > \alpha_2^H$. This requires that there is an ability level $a' \in (\alpha_2^H, \alpha_1^H)$ such that candidate 1 with type (a', θ^H) prefers to propose the status quo, while candidate 2 with the same type prefers to propose the reform. At the same time, a reform proposal by candidate 1 must be associated with a higher expected payoff and, hence, a higher conditional winning probability than a reform proposal by candidate 2. We show by contradiction that such a situation is impossible.

Rearranging (A.2), $\alpha_1^H > \alpha_2^H$ implies that

$$\begin{aligned} \frac{\hat{\pi}_2(1) - \hat{\pi}_2(1)}{\hat{\pi}_2(1)} = \frac{c - \alpha_2^H}{\theta^H} \quad &> \quad \frac{c - \alpha_1^H}{\theta^H} = \frac{\hat{\pi}_1(1) - \hat{\pi}_1(1)}{\hat{\pi}_1(1)} \\ \Leftrightarrow \hat{\pi}_2(1)\hat{\pi}_1(0) \quad &> \quad \hat{\pi}_1(1)\hat{\pi}_2(0) \; . \end{aligned} \tag{A.3}$$

We compute $\pi_i(1)$ and $\pi_i(0)$ for $i \in \{1, 2\}$. Given $\alpha_1^H > \alpha_2^H \geq \underline{a}$, a reform by candidate 1 has a larger expected payoff than a reform by candidate 2, giving rise to the winning probabilities $s(1, 1) = s(1, 0) = 1$. If both candidates propose the status quo, each wins with $s(0, 0) = 1/2$ by the tie-breaking rule imposed in Subsection (4.3). For $(x_1, x_2) = (0, 1)$, candidate 2 wins with probability $\tilde{s} = 1 - s(0, 1) \in (1, 1]$, where $\tilde{s} = 1$ is $\alpha_2^H > \underline{a}$. Hence, the expected power share $\hat{\pi}_i(x_i)$ of candidate i is given by

$$\begin{aligned} \hat{\pi}_1(1) &= \rho \; , \\ \hat{\pi}_1(0) &= \frac{1}{2} - [1 - K(\alpha_2^H)]\tilde{g} \; , \\ \hat{\pi}_2(1) &= K(\alpha_1^H)\left(\frac{1}{2} + \tilde{g}\right) + \left[1 - K(\alpha_1^H)\right](1 - \rho) \; , \\ \hat{\pi}_2(0) &= K(\alpha_1^H)\frac{1}{2} + \left[1 - K(\alpha_1^H)\right](1 - \rho) \; , \end{aligned}$$

where $\tilde{g} = 2\left(\rho - \frac{1}{2}\right)\left(\tilde{s} - \frac{1}{2}\right) \in \left(0, \rho - \frac{1}{2}\right]$. Collecting terms, we find that

$$\begin{aligned} \hat{\pi}_2(1)\hat{\pi}_1(0) - \hat{\pi}_1(1)\hat{\pi}_2(0) = \; & \frac{1}{2}K(\alpha_1^H)\left(\frac{1}{2} + \tilde{g} - \rho\right) + (1 - \rho)\left[1 - K(\alpha_1^H)\right]\left(\frac{1}{2} - \rho\right) \\ & - \tilde{g}\left[1 - K(\alpha_2^H)\right]\hat{\pi}_2(1) \; , \end{aligned}$$

which is weakly negative because $\tilde{g} \in [0, \rho - 1/2]$ and $\rho \in [1/2, 1]$. This contradicts (A.3), ruling out asymmetric equilibria with $\alpha_1^H > \alpha_2^H$.

Moreover, there is no asymmetric equilibrium with $\alpha_1^H = \alpha_2^H > \underline{a}$ and $s(1, 1) \neq 1/2$. In this case, we would have $\pi_1(1) \neq \pi_2(1)$ and $\pi_1(0) = \pi_2(0)$ at the same time. Then, indifference condition (A.2) cannot be satisfied at the same cutoff $\alpha_1^H = \alpha_2^H$ for both candidates. $\square$

Proof of Lemma 1

By Proposition 2, 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 (8) in the main text. To simplify notation, we denote by g_ρ the derivative of $g(\rho, s_{10})$ with respect to ρ and suppress the arguments of $g(\rho, s_{10})$ in the following. Implicit differentiation of (8) gives

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

In type I equilibria, $g_\rho(\rho, 1) = 1$ and $g(\rho, 1) = \rho - 1/2$. By equilibrium condition (8), the numerator equals $\frac{c-\alpha^H}{2g} g_\rho$, which is strictly positive for all $\rho > \frac{1}{2}$. Under Assumption 2, the denominator is strictly positive as well. Consequently, the overall effect is negative.

Proof of Proposition 3

First, the unique equilibrium is always of type I 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 (8) is satisfied for $\alpha^H = c$.

By Lemma 1, the cutoff α^H strictly decreases with ρ. Moreover, implicit differentiation of (8) gives $\frac{d\alpha^H}{d\theta^H} < 0$ and $\frac{d\alpha^H}{d\mu} < 0$ for any type I equilibrium with $\rho > \frac{1}{2}$. Two possible cases arise.

Case a: If $\theta^H < \bar{\theta}(\mu) = [1 + K(\underline{a})](c - \underline{a})$, 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 a type I equilibrium for all $\rho \in \left[\frac{1}{2}, 1\right]$. (Note that K depends on $\underline{a}$ as well as μ, the probability to draw an egoistic candidate.)

Case b: If $\theta^H \geq \bar{\theta}(\mu)$, we get $R(\underline{a}, 1, 1) \geq 0$ and $R(\underline{a}, 1, 1/2) = (\underline{a} - c)/2 < 0$. 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, if and only if $\rho < \bar{\rho}(\theta^H, \mu)$, $R(\underline{a}, 1, \rho) < 0$ is true and a type I equilibrium exists.

Finally, the derivative of $\bar{\theta}(\mu)$ is given by $\bar{\theta}'(\mu) = [\Phi(\underline{a}) - \Phi(c)](c - \underline{a}) < 0$.

Proof of Proposition 4

Unique maximum

We measure welfare by the voter's expected utility from ex ante perspective. As explained in the main text, this is given by

$$W(\rho) = 2\left[s^R\rho + (1-s^R)(1-\rho)\right]B(\alpha^H).$$

A reforming candidate wins the election with probability s_{10} if her opponent proposes the status quo and with probability $s(1,1) = 1/2$ if her opponent proposes a reform as well. As a consequence, the winning probability s^R is given by

$$s^R = K(\alpha^H)s_{10} + \frac{1-K(\alpha^H)}{2}.$$

Inserting this probability and our definition of $g(\rho, s_{10})$, voter welfare is given by

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

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 type I equilibria, and equals zero in all type II 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 a type I equilibrium.

Second, we show that the welfare function is strictly quasi-concave in ρ for type I equilibria, $\rho < \bar{\rho}(\theta^H, \mu)$, where $s_{10} = 1$ and α^H is implicitly defined by (8). In a type I equilibrium, the derivative of W with respect to ρ is given by

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

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 $\left(\frac{1}{2}, 1\right)$. Recall that $W(\rho) > 0$ in all type I 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

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

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 3, 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 $\left[\frac{1}{2}, \bar{\rho}(\theta^H, \mu)\right)$. Recalling that $W(\rho) = 0$ in all type II equilibria, this implies that W is globally quasi-concave and has a unique maximum in $\left[\frac{1}{2}, 1\right]$.

Optimality of power dispersion

Proposition 4 states that some power dispersion is optimal if and only if θ^H exceeds a unique threshold $\tilde{\theta}(\mu) < \bar{\theta}(\mu)$.

First, full concentration of power is optimal if and only if $h(1) \geq 0$. This is true for $\theta^H \to 0$, 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 type I equilibrium. Under Assumption 3, h is strictly increasing in α^H. Hence, the derivative $\frac{dh}{d\theta^H}$ is strictly negative in every type I 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 type II equilibrium, full concentration of power can hence not be optimal. By continuity, the same holds for levels of θ^H slightly smaller than $\bar{\theta}(\mu)$. Hence, the threshold $\tilde{\theta}(\mu)$ for the optimality of power dispersion is strictly below $\bar{\theta}(\mu)$.

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 a type I 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

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

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

With respect to the indirect effect, implicit differentiation of (8) gives

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

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 type I equilibrium.

Altogether, we find that $\tilde{\theta}'(\mu) < 0$. Hence, if the share of egoistic candidates is increased, 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

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

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

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

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

B Graphical illustration of welfare effects

The following figure illustrates for a numerical example how the sizes of positive empowerment effect and the negative effects (disciplining, selection) on voter welfare change with the concentration of political power ρ.

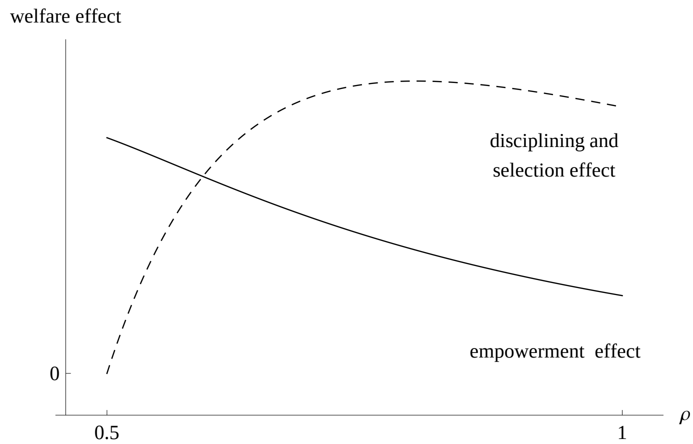

Figure 3: The welfare effects of a change in ρ. *The solid line represents the (positive) empowerment effect, the dashed line represents the sum of the (negative) disciplining and selection effects. The optimal level of* ρ *is attained at the intersection of both lines. Parameters: uniform ability distribution, c=0.6,* μ*=0.8,* θ^H*=0.6.*

C Empirical illustration

Our model makes novel statements about the welfare effect of power concentration and its dependence on the conflict of interest between voters and politicians. These results give rise to empirically testable predictions under the assumption that real-world institutions have not been chosen optimally (according to our model). This assumption seems plausible if institutional settings and the implied levels of power concentration in the real world differ mainly for historical reasons such as, e.g., the predominant views at the time of constitutional drafting, the settings in neighboring countries or their colonial heritage.[25] Under this assumption, Corollary 2 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.*

Ideally, we would like to test this hypothesis empirically for a large set of countries. Unfortunately, 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. In this subsection, we present the operationalization of our main empirical model. The analysis is followed by several robustness checks in which we show that our results survive the use of alternative operationalizations.

As a measure for *efficient policies*, we use growth in real GDP per capita in constant 2005 US $ as provided by the World Bank (2012). It provides a concise and objective measure of developments that bear the potential of welfare improvements.

[25] Alternatively, one could assume that power concentration has been chosen optimally according to our model. In this case, our model would predict a negative cross-country correlation between measures of power concentration and the conflict of interest. In our set of countries, however, we find a positive correlation that is not significantly different from zero ($p = 0.428$).

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 includes questions on voters' opinions about politicians. In its 2004 survey, conducted in 38 countries, it included the item "Most politicians are in politics only for what they can get out of it personally" (ISSP Research Group 2012). 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. As these changes are not captured by the Lijphart index, we have to 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.[26] 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.[27]

[26] The remaining countries are Australia, Austria, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

[27] If 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 theoretical model is correct. The reason is that, in this case, countries with a large conflict of interest might be on a more positively sloped part of the welfare function than countries with a small conflict of interest.

The time-invariant dependent variables require a cross-section analysis. All explanatory variables correspond to 2004 or earlier years. To address potential problems of reversed 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., Sala-i-Martin 1994) and may alter 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.

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 4 shows how growth is related to the concentration of power for the two sets of countries. The left panel contains countries with a small conflict of interest, while the right panel contains countries with a large conflict of interest. The figure shows that power concentration is only weakly related to growth if the conflict of interest is small, whereas power concentration is negatively related to growth if the conflict of interest is large.

Figure 4: Relationship between power concentration and growth

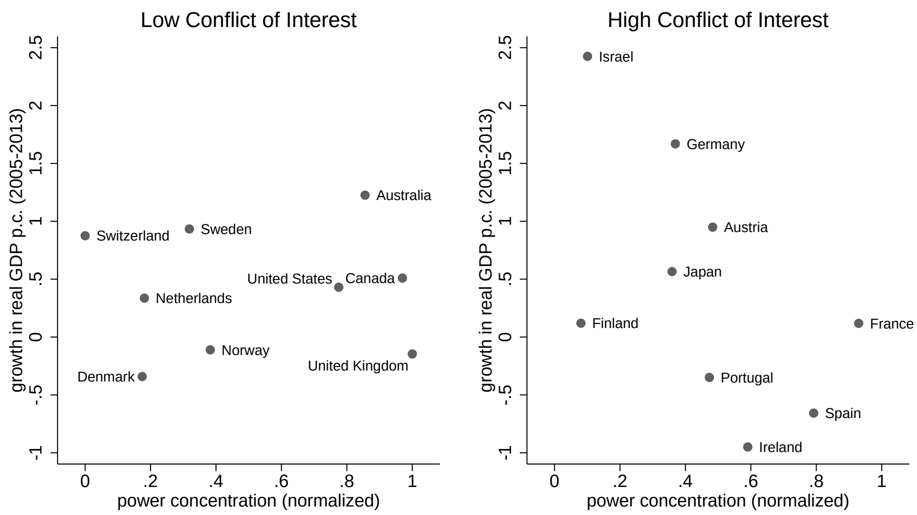

Table 1: OLS regression results

	Growth in real GDP per capita (2005-2013) (a)	(b)
Power concentration	−0.526	4.224**
	(0.642)	(1.635)
Conflict of interest	−0.196	3.096**
	(1.305)	(1.235)
Power concentration		**-9.530****
× Conflict of interest		(3.581)
Real GDP per capita	−0.020	−0.019
in 2004 (in $ 1000)	(0.027)	(0.019)
Growth in real GDP per	−0.301***	−0.387***
capita (1991-2004)	(0.084)	(0.104)
Constant	2.160	0.755
	(1.588)	(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.

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 1 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 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 large. 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.

These results suggste that the welfare effect of power concentration depends strongly on the conflict of interest. The conditional effect of power concentration at the smallest and the largest level of conflict of interest in our country set are re-

Table 2: 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.

ported in Table 2. At the smallest level of conflict, power concentration is positively related to growth. At the largest level of conflict, in contrast, power concentration is negatively related to growth. Our analysis thus leads to the following result.

Result. *The higher the conflict of interest between voters and politicians is, 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, as predicted by our model. Our model delivers a plausible explanation for the pattern in the data: Countries with a small conflict of interest benefit from power concentration as it helps them empower better candidates; Countries with a large conflict of interest suffer from power concentration as it induces more inefficient reforms and worse selection of candidates. While the data support our theoretically derived hypothesis, we are unable to test the explanation provided by our model against alternative explanations.

Robustness

The specification used above is parsimonious and may give raise to a concern 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. 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 trust had a non-linear effect on growth, in addition, 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,[28] 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 model specification 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 by 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 get similar results if we use a modified index for the executive-parties dimension suggested by Ganghof & Eppner (2019) that focuses on the clarity of responsibility and accountability ($p = 0.005$, $F = 4.10$, $N = 19$), the index for checks and balances (Keefer & Stasavage 2003, $p = 0.019, F = 16.12, N = 18$) and the political constraint (POLCON) index (Henisz 2006, $p = 0.060, F = 15.60, N = 18$). For the nine-categorical type of electoral system (IDEA 2004), the coefficient of the interaction term has the same sign, but becomes insignificant ($p = 0.216, F = 5.32, N = 18$).

The interaction term is also of the expected sign and remains significantly different from zero, if we measure the conflict of interest between voters and politicians by the belief that politicians are more interested in votes than peoples' opinions, elicited in the ESS (2002, $p = 0.020$, $F = 7.12$, $N = 17$) or the Corruption Perception Index (Transparency International 2004, $p = 0.005$, $F = 7.86$, $N = 18$). Using trust in political parties from the Eurobarometer, however, yields an insignificant interaction term (European Commission 2012, $p = 0.173$, $F = 1.38$, $N = 16$).

Finally, 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 from the sample the countries 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, $F > 2.53$).

[28] The 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?".