Leaping into the dark: A model of policy gambles *

Kartik Anand[1] Prasanna Gai[2] Philipp J. König[1]

Abstract

We examine why rational voters support risky "policy gambles" over a safe status quo, even when such policies are detrimental to welfare. In a model of electoral competition, investors finance domestic projects in exchange for a stake in future output, while voters receive the remaining output. Government policy influences the riskiness of projects' output. However, when investors invest, the incumbent cannot pre-commit to retain the status quo policy into the future. Instead, future policy is determined subsequently in an election where voters can increase their expected output by voting for policy gambles. Our analysis highlights how investors' self-fulfilling beliefs interact with the distribution of output in abandoning the status quo. We argue that institutions that foster political consensus can eliminate the gamble equilibrium and raise welfare.

Keywords: Policy uncertainty, electoral competition, multiple equilibria, political consensus.

JEL classifications: D72, D78, P16.

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1 Introduction

Motivation and contribution. Why do rational voters sometimes support risky policy shifts – that entail radical changes to existing frameworks and institutions – in lieu of maintaining a safe status quo, even though such support may be detrimental to their welfare? Our interest in this question is motivated by the tumultuous process surrounding the United Kingdom's (UK's) exit from the European Union (EU) following general elections in 2019, and the renegotiation of the North American Free Trade Agreement (NAFTA) initiated by then President of the United States (US), Donald J. Trump, following his election victory in 2016. Both events constituted major shifts away from an established status quo with rather uncertain outcomes.

In this paper, we provide a model of electoral competition to analyze voters' decisions to support risky policy shifts away from a status quo, which we refer to as 'policy gambles'. A policy gamble differs from other risky changes in policy (e.g. a marginal increase in tax rates), as it constitutes a fundamental departure from well-understood policy frameworks and institutions towards untested, less understood frameworks where a clear blueprint for the future course of policy is absent (**?**).[1]

Notwithstanding the differences between various policy gamble episodes and their unique historical circumstances, there are common threads that are amenable to theoretical inquiry. For example, empirical evidence highlights how distributional conflicts led to support for 'Brexit' (**??**), or the trade policies of President Trump

[1] For example, 'Brexit' or the NAFTA renegotiations constitute shifts away from the established institutions and policy frameworks, such as membership in the EU and rules-based international trade. Another example of such a fundamental shift away from an established status quo is the economic liberalization in New Zealand in the 1980s known as 'Rogernomics' (**?**).

(??). The breakdown of institutions that foster political consensus in both the UK and the US (??) also eroded the ability of governments to commit to the status quo. This, in turn, may have paved the way for radical policy proposals to enter the political discourse.

In this paper, we seek to integrate some of these elements into a theoretical framework that shows how an equilibrium can arise where rational voters support policy gambles. Importantly, our goal is not to provide detailed accounts for particular historical events such as 'Brexit', but rather to show that, in general, such policy gambles can be vehicles by which voters influence the way in which output is divided in society. The model articulates a novel three-way strategic interaction between voters, investors, and political parties that highlights the important role of self-fulfilling beliefs. Crucially, these beliefs pin down the circumstances that make it inevitable for rational voters to support policy gambles even though they are, from an ex ante perspective, detrimental to their welfare.

Framework. The model consists of two groups of risk-averse agents – 'investors' and 'voters' – and two political parties. Investors are endowed with capital and must decide whether to invest it in either risky domestic projects or in a safe outside option (e.g., safe offshore investments). In exchange for investing in domestic projects, they receive claims to their projects' future output. Voters have no endowments and obtain the remaining share of future domestic output.

The output of domestic projects also depends on the future policy choice of the government. But when investors invest, the incumbent government cannot pre-commit to maintaining the prevailing status quo policy into the future. Instead, the policy is set by competing political parties vying to win elections by attracting voters who have preferences over consumption as well as heterogeneous ideological predilections towards policy. The equilibrium policy choice and the election outcome correspond to the policy preference of the median voter. For ease of exposition, we assume in the baseline model that investors cannot vote in the election.

Following **?**, the mapping from policies into outcomes is the realization of a stochastic process drawn by Nature. However, only one point on this mapping – the 'status quo' – is known. As elected policies deviate away from the status quo, their expected outcome and variance scale proportionally to the magnitude of the policy shifts. Thus, larger policy shifts engender greater uncertainty over the outcome than smaller shifts. For this reason, we refer to policy shifts away from the status quo as 'policy gambles'. We assume that a policy choice affects all domestic projects in the same way, i.e., policy acts like an aggregate shock on domestic output.

Marginal policy deviations away from the status quo elicit three effects on voters: (i) how attracted they are to the prospect of greater output (*growth effect*); (ii) their aversion to changes in the size of output (*risk effect*), and (iii) their antipathy towards marginal policy changes that are misaligned with their ideals (*ideology effect*). The relative magnitude of these three effects on voters' utility depends on voters' share of output. If voters' stake in domestic output is larger, the growth effect is larger because voters benefit more from marginal increases in domestic output. At the same time, the risk effect is also larger since voters have more to lose when their stake is larger. Hence, the policy that wins the election crucially depends on the relative magnitude of risk versus growth effects, which, in turn, depends on the distribution of output between voters and the investors. Yet, the distribution of output is determined by the beliefs of the investors about the future policy choices. The reason is that investors require a sufficiently large share of output that compensates them for the risk of adverse outcomes following a policy gamble.

Main results. In the benchmark case of the model, the mapping from policy into outcomes is known to all, i.e., we abstract from the risk effect. When policy outcomes are predictable, voters' policy preferences are determined only by the interaction between the growth effect and the ideology effect. The median voter's policy preferences and, therefore, the equilibrium policy choice are uniquely determined. In this deterministic setting, the compensation sought by the investors does not adversely impact the subsequent efforts of political parties to propose policies that satiate the median voter.

When policy outcomes become unpredictable, the risk effect emerges. Compared to the case with predictable policy outcomes, voters become less inclined to favor policy departures from the status quo and a voting bloc emerges – biasing policy in favor of the status quo. Since the relative weights of the growth and risk effects depend on voters' share in domestic output, the equilibrium policy choice is a direct response to how output is split between the investors and voters. The beliefs of investors about the claims of others play a pivotal role in determining this split of output.

When the investors are sufficiently risk-averse, multiple equilibria may arise. For example, if an investor believes that all other investors are expecting the future government to pursue a policy gamble, then her individual response is to demand greater compensation. If all investors share this belief, then, in aggregate, the investors obtain a relatively larger share of output while the voters' share is relatively smaller. Since a smaller share of output dilutes the voters' risk effect, they respond by voting for a policy gamble thereby validating the investors' initial beliefs. Conversely, if any single investor believes that others are acting on the belief that the future government will retain the status quo, their required compensation is smaller, leading to a larger share of output that accrues to voters, which increases their relative weight on the risk effect and induces them to support the status quo in line with the investors' initial beliefs.

Our results on the multiplicity of equilibria provide a novel explanation for why rational voters may sometimes be driven to vote for policy gambles that are detrimental to their ex ante welfare. Depending on the beliefs held by investors over the future course of policy, the median voter can shift from being in the status quo voting bloc to support the policy gamble. In particular, when investors anticipate a policy gamble and, as a consequence, demand a larger share of output, it is a best response for the median voter to support the policy gamble. From an ex ante perspective, the gamble equilibrium leads to lower welfare compared to the status quo equilibrium. Political consensus, whereby opposing politicians commit credibly to sticking with the status quo policy into the future, can help eliminate the policy gamble equilibrium and improve welfare.

Finally, to explore the robustness of our results, we consider four extensions. First, we consider the consequence of voters becoming ideologically inclined to favor policy gambles. We show that when their ideological bias is large, this can lead to an equilibrium breakdown whereby investors refuse to invest. Second, we consider an incumbent who is required to campaign on its established record, i.e., the status quo policy. In this case we show that the policy gamble equilibrium is characterized by policy divergence, where it is the opposition that proposes the policy shift and wins the election. However, the incumbent still receives all the votes from voters in the status quo voting bloc. Third, we consider the case where investors have ideological preferences and can also vote in the election. We show that this does not qualitatively impact our main results. And finally, we relax the assumption that only one point in the mapping from policies to outcomes is known and allow beliefs to be anchored by two points in the mapping. We show that when policy unpredictability is large, voters become 'polarized', i.e., they become completely split between two different voting blocs.

The remainder of the paper is structured as follows. Section 2 presents our baseline model. In Section 3 we derive the equilibrium and present some comparative static results for policy gambles. Our welfare analysis is presented in Section 4 and extensions to the baseline model are presented in Section 5. Finally, in Section 6 we discuss how key elements of the Brexit process bear hallmarks of policy gambles.

Related literature. Our paper adds to a large literature on policy experimentation and policy reform. **?** model policy gambles in a reputational framework in which, early on in their tenure, governments either inefficiently stick to the status quo or gamble by recklessly experimenting with new policies. Over time, as the government acquires a reputational stake in its enacted policy, it becomes loathe to change course. **?** focus on time inconsistent policymaking and the strategic incentives that an incumbent has to experiment with policy in order to influence the informational environment of a successor government. And **?** show how uncertainty about economic outcomes promotes reform by making re-election probabilities depend more on luck and less on policy action. They find that this enables governments to more readily adopt policies with short-run costs and long-run benefits.[2]

? shows how the interaction between capital flows and electoral uncertainty can magnify exogenous shocks and give rise to self-fulfilling politico-economic crises. **?** draw on prospect theory to suggest that following a large shock, loss aversion can drive voters to support risky re-distributive policy reforms. While we share the emphasis

[2]There is also an older literature in political science on how electoral competition plays out when voters are uncertain over candidates' policy positions. See for example **??** and **?**.

of this literature on the uncertain mapping from policy into outcomes, our model emphasizes the role of investment by the investors ahead of the election in shaping voters' support for policy shifts as a means to address their perceived unequal share of output. As such, our model also features self-fulfilling beliefs.

The literature on policy reform also provides reasons for policy persistence. **?** argue that uncertainty about the distributional consequences of a reform can act as brake on its adoption, inducing a status quo bias among voters. Inefficient delays may also arise when different interest groups are involved in a war of attrition (**?**). **?** suggest that, once implemented, a policy improves the lobbying effectiveness of its beneficiaries thereby making it harder to remove. And **?** consider how reforms should be designed to overcome the status quo bias, concluding that gradualist reform lowers the option value of waiting relative to big-bang initiatives.[3] We offer a different justification for the status quo bias – showing that it arises as a consequence of policy unpredictability, open-ended beliefs, and the endogenous formation of a voting bloc in favor of the known policy.

2 Model

Agents and actions. There are two groups of agents: (i) a measure $\lambda^I > 1$ of investors, indexed by $j \in [0, \lambda^I]$, and (ii) a measure $\lambda > 1$ of voters, indexed by $i \in [0, \lambda]$. There are also two political parties: an incumbent (I) and an opposition (O). Each investor is endowed with one unit of capital, while voters have no initial endowment. The game proceeds in two stages. In the first stage, investors decide whether to invest their unit of capital domestically in exchange for a share of future

[3] Another strand of the literature uses an information-theoretic approach to explore how politicians pander to the electorate. See, for example, **??** and **?**.

output or in a safe outside option. One can think of the investors in our model as either foreign entities engaged in cross-border investment (i.e., foreign direct investment) or domestic owners of capital. In the second stage, voters – who obtain future aggregate output net of that which accrues to investors – vote in an election between the incumbent and opposition. Investors do not vote.[4] The parties choose policy platforms – that influence the riskiness and outputs of domestic projects – to attract votes.

Policy and production technology. There is a unit of domestic resources, e.g., land or infrastructure. These resources are administered by the government on behalf of the voters. Each unit of domestic resource must be combined with one unit of investors' capital to produce output. In the absence of investors' capital, domestic output is zero. We refer to the combination of one unit of domestic resources with a unit of capital as a 'project'. Thus, in total, there is a unit mass of domestic projects to be initiated.

Projects' outputs are uncertain and perfectly correlated. Following the investment, the projects' output is further shaped by the government's policy. Although there is a status quo policy, $p = 0$, in place when projects are first initiated, voters cast a vote for a party in a subsequent election where political parties can offer up new policy platforms. Thus, domestic project output, $\pi(p^w)$, depends on the winning policy, p^w, implemented following the election. Whenever $p^w = 0$, the status quo is retained. Under the status quo policy, project output $\pi_0 \equiv \pi(0)$ is deterministic and common knowledge among all agents. But if $p^w \neq 0$, then the winning party offers voters a new, untried, policy. Under this policy, $\pi(p^w)$ is a random variable.

[4] In Section 5.3 we consider the case where investors also vote. We recover the results of the main model in the limit that investors are an arbitrarily small share of the overall population and so their voting has no bearing on the election outcome.

Following **?**, the mapping from policies to output is chosen by Nature and is the realized path of a Brownian motion. A change in policy equally affects the outcomes for all projects, i.e. it induces aggregate shock on project outcomes and we abstract from idiosyncratic shocks. The drift $\mu > 0$ and variance $\sigma^2 > 0$ of the Brownian motion are known to the agents. The further an untried policy is away from the status quo, the more uncertain its outcome. For any policy, $p^w \neq 0$, project output is normally distributed with

$$\text{mean: } \mathbb{E}\left[\pi\left(p^w\right)\right] = \pi_0 + \mu p^w \quad \text{and} \quad \text{variance: } \operatorname{Var}\left[\pi\left(p^w\right)\right] = \sigma^2\left|p^w\right| .$$

The drift measures the marginal impact of a change in policy on expected output, while the variance captures how predictable policy changes are.[5] Following **?**, the ratio $\chi \equiv \sigma^2/\mu$ is a measure of policy complexity. It measures by how much a marginal deviation in policy increases the variance of the outcome relative to its expected gain. If, for example, the ratio χ is small, then the uncertainty from deviating from the (deterministic) status quo is small compared to its expected gain and vice versa. As such, χ provides a measure of the difficulty (complexity) in predicting the gain of marginal policy shifts away from the status quo.

Payoffs and preferences. Payoffs are determined after the election, once the winning party has implemented its policy, p^w, and projects' outputs are realized. We assume that political parties do not have ideological preferences and obtain a payoff only when they win the election and come to power. The payoff from losing the election is normalized to zero, while the payoff from winning is set to unity.

Investors obtain payoffs from either investing in domestic projects or in their safe

[5] In Section 5.4 we explore how knowledge of two points on the mapping between policies and outcomes, i.e., "Brownian Bridges", influences the behavior of voters.

outside option. The outside option yields $\omega > 1$, which is independent of government policy. From investing in a domestic project, investor j receives a share $\alpha_j \in (0,1)$ of the realized project output $\pi(p^w)$. Because there are more investors than domestic resources, competition drives down the share of output that accrues to investors so that their expected utility from investing domestically just equals the safe payoff from their outside option. Without loss of generality, we suppose that investors $j \in [0,1]$ invest in domestic projects, while the remaining, $j' \in (1, \lambda^I]$, invest in the outside option. The total compensation, $\alpha_j \pi(p)$, received by investor j can be thought of as project returns net of wage payments, rental costs for land and infrastructure or tax payments. The remaining output is equally distributed among the voters, e.g., in the form of wages and subsidies. Each voter therefore obtains $(1-\alpha)\pi(p^w)/\lambda$, where $\alpha = \int_0^1 \alpha_j dj$.

Investors and voters are risk-averse with mean-variance preferences.[6] The utility obtained by investor j from investing in a domestic project is

$$u_j^I(\alpha_j, p) = \mathbb{E}[\alpha_j \pi(p)] - \gamma \text{Var}[\alpha_j \pi(p)]\,, \tag{1}$$

where $\gamma > 0$ is the coefficient of absolute risk aversion. The utility obtained from investing into the outside option is ω. Finally, voter i's utility is

$$u_i(\alpha, p) = \mathbb{E}\left[\frac{(1-\alpha)}{\lambda}\pi(p)\right] - \gamma \text{Var}\left[\frac{(1-\alpha)}{\lambda}\pi(p)\right] - \frac{1}{2}(p - b_i)^2\,. \tag{2}$$

[6]The assumption that voters have preferences with constant absolute risk aversion (CARA) is made for tractability. The results remain unchanged for preferences with increasing absolute risk aversion (for example, quadratic utility). Moreover, as long as the utility function is not 'too concave' (i.e., the absolute prudence and the absolute temperance coefficients (**?**) are sufficiently small), the behavior of the median voter is qualitatively the same as under CARA preferences.

In contrast to investors, voters not only care about consumption but also have ideological preferences that may be thought as stemming from, for example, deeper (unmodelled) cultural predilections (?). These preferences are reflected by bliss points $b_i \in \mathbb{R}$ for the policy, with deviations of policy from the bliss point generating disutility for voter i. The bliss points are identically and independently drawn from a standard normal probability distribution function $\phi(b)$. We denote the cumulative distribution function $\Phi(b)$.[7]

Elections and policy choice. The incumbent and an opposition contest the election. They compete by offering policy platforms, $p_k \in \mathbb{R}$, where $k \in \{I, O\}$. Since the parties only care about winning the election, they do not have a preference over policies. Given the platform of the opponent, p_{-k}, party k chooses p_k to maximise the probability of winning, $\beta_k(p_k, p_{-k})$. Voters vote for the party whose platform delivers the highest utility. In case of a tie, a voter is indifferent between the two parties and is equally likely to vote for either one. Upon winning the election, a party immediately assumes office and implements the policy on which it campaigned.

Note that the political parties face a commitment problem: the incumbent party cannot credibly pledge that, following the election, a newly elected government will retain the status quo. So while the sharing rule over domestic output cannot be changed after the investment is made, voters can still influence the payoffs they obtain by voting for the party that proposes a shift in the policy away from the status quo. Since investors invest before the policy choice is made, their required output

[7] This assumption implies that voters, on average, hold an ideological preference for the status quo. In Section 5.1 we discuss the consequences of relaxing this assumption. On the one hand, if the bliss point mean is not too large, then our results remain qualitatively unchanged. On the other hand, sufficiently large ideological shifts can lead to a breakdown of the equilibrium and result in no investment.

share depends on their beliefs about the future policy choice.

Timing. First, investors observe the returns from investing in their safe outside option, ω, and decide on the shares of domestic project output they require to invest. Second, the incumbent and opponent political parties contest in an election where voters can vote. The parties choose policy platforms that influence the riskiness and output from domestic projects to win votes. The winning party then implements its winning policy. Finally, projects' outputs are realized and agents obtain their payoffs.

2.1 Politico-economic equilibrium

Marginal changes in policy away from the status quo induce three countervailing effects on voters' utility:

$$\frac{\partial u_i(\alpha,p)}{\partial p} = \underbrace{\mu\left(\frac{1-\alpha}{\lambda}\right)}_{\text{growth effect}} - \underbrace{\gamma\,\sigma^2\left(\frac{1-\alpha}{\lambda}\right)^2\frac{\partial|p|}{\partial p}}_{\text{risk effect}} - \underbrace{(p-b_i)}_{\text{ideology effect}} \quad . \tag{3}$$

A marginal increase in p leads to an increase in expected project output, which increases the voter i's utility. Voters benefit from this *growth effect* if their share in output is larger. A marginal increase in p also increases the variance of output, which voters are averse towards. The larger the coefficient of risk aversion, γ, or voters' share in output, the stronger is this *risk effect*. Finally, there is also an *ideology effect*. Since voter i's expected utility depends negatively on the difference between the policy, p, and the bliss point, b_i, a marginal increase in policy away from the status quo reduces expected utility if $p > b_i$ and increases it if $p < b_i$.

Voter i casts a vote for the incumbent whenever $u_i(\alpha,p_I) > u_i(\alpha,p_O)$. Conversely, if $u_i(\alpha, p_I) < u_i(\alpha, p_O)$, she votes for the opposition. If $u_i(\alpha, p_I) = u_i(\alpha, p_O)$, then voter i is indifferent between the two parties and is equally likely to vote for either one. For party k, the probability of winning the election when it chooses policy p_k, given that the opponent chooses policy p_{-k}, is given by:

$$\beta_k(p_k, p_{-k}) = \begin{cases} 1 & \text{if} \quad \nu_k > \nu_{-k} \\ 0.5 & \text{if} \quad \nu_k = \nu_{-k} \\ 0 & \text{if} \quad \nu_k < \nu_{-k} \end{cases}, \tag{4}$$

where $\nu_k = \left|\left\{i \in [0, \lambda] \,|\, u_i(\alpha, p_k) \geq u_i(\alpha, p_{-k})\right\}\right|$ is the mass of voters voting for k.

Political parties choose their policy platforms in order to maximize their probabilities of winning the election, i.e.,

$$p_k = \underset{p'_k}{\arg\max}\, \beta_k(p'_k, p_{-k}). \tag{5}$$

The winning policy is thus

$$p^w = \begin{cases} p_I & \text{if} \quad \beta_I(p_I, p_O) \geq \beta_O(p_I, p_O) \\ p_O & \text{if} \quad \beta_I(p_I, p_O) < \beta_O(p_I, p_O) \end{cases}.$$

We consider a sub-game perfect politico-economic equilibrium where political choices and economic outcomes are mutually consistent. The equilibrium is defined by (α^*, p_I^*, p_O^*): the incumbent and opponent choose their policy platforms, p_I^* and p_O^*, to maximize their probabilities of winning the election, given the shares of project output that accrue to the investors; and competition amongst the investors drives down their project share, α^*, to a level where they are just indifferent between investing in the domestic project or their outside option. Since an incumbent government cannot commit to the status quo when output shares are determined, the investors form rational expectations, p^e, about the policy that is chosen in equilibrium. So the output share that ensures investment depends on the policy that they expect voters to support.

To ensure that investors invest in domestic projects under the status quo policy, we impose the following assumption.

Assumption 1. *The outcome of the status quo policy and the safe outside option satisfy:*

$$\frac{\omega}{\pi_0} \in \left(\frac{1}{1+\lambda}, 1 \right).$$

Assumption 1 is a sufficient condition to guarantee the existence and uniqueness of a socially optimal policy. It further implies that to attract investment under the status quo policy, the share of output required to compensate investors must at least be as large as the "fair split", $1/(1+\lambda)$.

3 Analysis

We begin by first considering the benchmark case without policy uncertainty where the risk effect is not present. We then study how policy uncertainty and the resulting risk effect affect the equilibrium policy choice.

3.1 Predictable policies

Consider the limiting case $\sigma \to 0$ where project outcomes are certain for all policies, not just the status quo. The policy that maximizes the expected utility of the voter i' is $b_i + \left(\frac{1-\alpha}{\lambda}\right)\mu$. As the voter's share of project output increases, so too does the influence of the growth effect on her preferred policy. When this share declines, however, the weight placed on the ideology effect increases.

The assumption that bliss points follow a standard normal distribution implies that voters' preferred policies are also normally distributed with mean (and median) $\left(\frac{1-\alpha}{\lambda}\right)\mu$ and variance λ (see Figure 1). The median voter theorem (**??**) implies that the policy platforms of the two parties converge, $p_I = p_O = p^w(\alpha)$, and the winning policy is the median preferred policy

$$p^w(\alpha) = \left(\frac{1-\alpha}{\lambda}\right)\mu\,.$$

Since the median bliss point is zero, the winning policy is strictly non-negative.

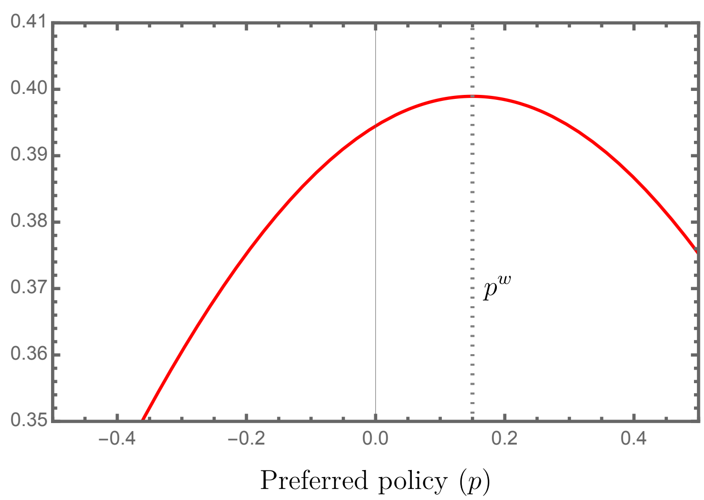


Figure 1: Distribution of preferred policies with predictable policy outcomes.

As the payoff from investing in a domestic project must be the same as the certain payoff from the outside option, competition among the investors implies that

$$\alpha^*(p^e) = \frac{\omega}{\pi_0 + \mu p^e} \, ,$$

where p^e is the representative investor's belief over the policy that will be implemented following the election. Under rational expectations, $p^e = p^w$, and subject to $p^w > 0$, there is a unique politico-economic equilibrium.

Proposition 1. *The unique equilibrium policy chosen by both parties, $p_I^* = p_O^* = p^* > 0$, and the share of project output accruing to investors, $\alpha^* \in \left[\frac{\omega}{\pi_0}, 1\right)$, are*

$$p^* \, = \, \frac{\mu}{2\lambda}\left(1 - \Lambda\right) \quad \textit{and} \quad \alpha^* \, = \, \frac{1}{2}\left(1 + \Lambda\right), \tag{6}$$

where $\Lambda \equiv \frac{\lambda}{\mu^2}\left(\pi_0 - \left[\sqrt{\left(\frac{\mu^2}{\lambda} - \pi_0\right)^2 + \frac{4\mu^2\pi_0}{\lambda}\left(1 - \frac{\omega}{\pi_0}\right)}\right]\right)$.

Figure 2 illustrates the equilibrium by plotting the winning policy, $p^w(\alpha)$, against the required share of investors in equilibrium, $\alpha^*(p^e)$. Proposition 1 provides the closed-form equilibrium solutions.

In the absence of risk about the policy outcome, voters always benefit from the growth effect, irrespective of the size of their stake, so the status quo policy is never selected in equilibrium. The deterministic nature of the mapping from policies to outcomes also ensures that, for any α, there is always a unique median policy. The compensation sought by the investors does not interfere with the efforts of political parties to adopt policies that satiate the median voter.

Importantly, as we show in the next section, once we allow $\sigma > 0$, the riskiness inherent in policy shifts creates uncertainty about voter behavior. And forwardlooking investors, who anticipate this uncertainty, may engender circumstances where voters indeed favor risky policy shifts. It is, thus, the existence of uncertainty about voter behavior rather than the risk surrounding the policy outcomes, per se, that leads to welfare losses.

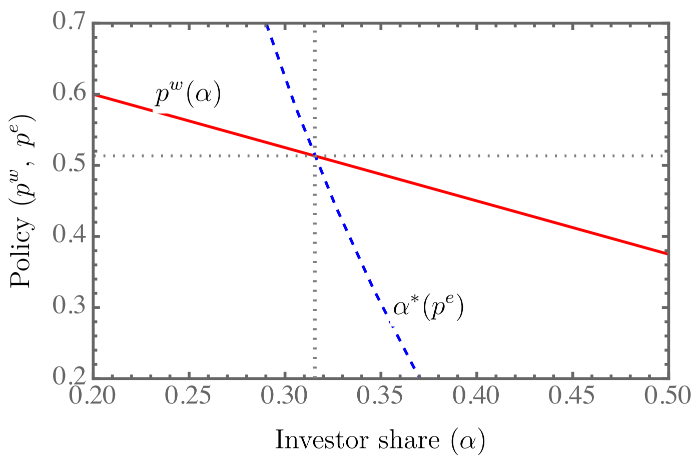


Figure 2: Equilibrium with predictable policy outcomes.

3.2 Policy gambles

When $\sigma > 0$, the mapping from policy to project output is not perfectly known. Departures from the status quo policy – *policy gambles* – now elicit a risk effect. As a result, voters who might have preferred to deviate from the status quo when $\sigma = 0$ become averse to policy gambles. Aversion to deviations from the status quo gives rise to an endogenous voting bloc that favors the status quo policy.

Definition 1. *A (P, Q) voting bloc is a mass $Q > 0$ of voters whose preferred policy is $P \geq 0$ that has a deterministic outcome.*

Proposition 2. *The probability distribution function of voters' preferred policies is* *a piecewise function,*

$$\widehat{\phi}(p) = \begin{cases} \phi\left(\frac{p-\underline{b}}{\sqrt{\lambda}}\right) & \text{if} \quad p < 0 \\ \phi\left(\frac{p-\bar{b}}{\sqrt{\lambda}}\right) & \text{if} \quad p > 0 \end{cases}, \tag{7}$$

with a status quo voting bloc $\left(0, \Phi(-\bar{b}/\lambda) - \Phi(-\underline{b}/\lambda)\right)$, *where:*

$$\bar{b} = \mu\left(\frac{1-\alpha}{\lambda}\right)\left[1 - \gamma\chi\left(\frac{1-\alpha}{\lambda}\right)\right], \quad \text{and} \quad \underline{b} = \mu\left(\frac{1-\alpha}{\lambda}\right)\left[1 + \gamma\chi\left(\frac{1-\alpha}{\lambda}\right)\right]. \tag{8}$$

Figure 3 plots the distribution of preferred policies across voters when policy outcomes are uncertain. To the right of the status quo policy, preferred policies are normally distributed with mean $\bar{b}$. To the left of the status quo, preferred policies follow a normal distribution with mean $\underline{b}$. The shift in the mean around the status quo policy reflects the influence of the risk effect on voters' preferences, which biases them to the status quo. Under the assumption that the median bliss point is zero, it follows that the median preferred policy is non-negative.

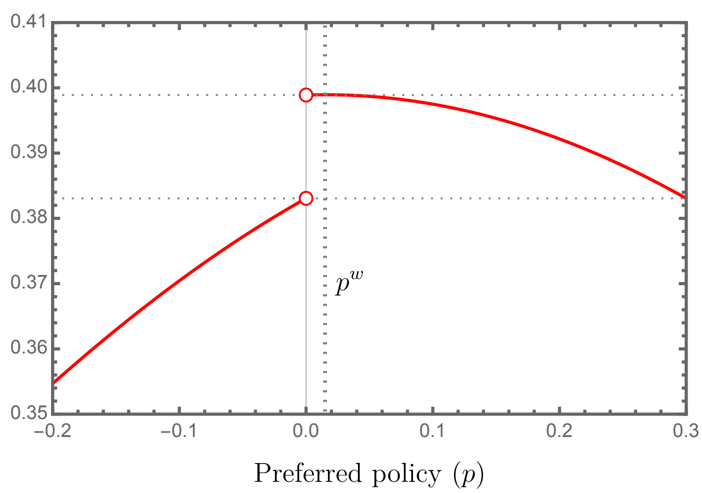


Figure 3: Distribution of preferred policies with unpredictable policy outcomes.

Proposition 3. *The policy platforms of both parties converge, $p_I = p_O = p^w(\alpha)$, and the winning policy is*

$$p^w(\alpha) = \max\left\{0,\, \mu\left(\frac{1-\alpha}{\lambda}\right)\left[1 - \gamma\chi\left(\frac{1-\alpha}{\lambda}\right)\right]\right\}. \tag{9}$$

Proposition 3 characterizes the political subgame equilibrium of the model. The winning policy depends non-linearly on voters' stake in aggregate project output. When this stake is large, $1 - \alpha \geq \frac{\lambda}{\gamma\chi}$, the risk effect of policy shifts dominates the growth effect since voters have more to lose. In this case, the median preferred policy is the status quo. For intermediate stakes, $1 - \alpha \in \left(\frac{\lambda}{2\gamma\chi}, \frac{\lambda}{\gamma\chi}\right)$, the growth effect dominates the risk effect and so the median preferred policy decreases in $1-\alpha$. Finally, if the stake of voters is small, so that $1 - \alpha < \frac{\lambda}{2\gamma\chi}$, the impact of the growth effect is also diminished. Following a marginal decrease in $1 - \alpha$, the ideology effect drives the median preferred policy towards the status quo.

Given a representative investor's belief, p^e, over future policy, the share of the output accruing to the investor, α^*, is given by the solution to

$$A(\alpha^*) \equiv \alpha^*\, \mathbb{E}[\pi(p^e)] - \gamma\big(\alpha^*\big)^2 \mathrm{Var}[\pi(p^e)] - \omega = 0\,. \tag{10}$$

Investor utility and the required share α^* are influenced by both the growth and risk effects. Given the belief, p^e, there are two feasible solutions for α^*. Since investors are subject to perfect competition, the smaller root of Equation (10) is the relevant solution.[8]

Lemma 1. *There exists a threshold, $\hat{\gamma} > 0$, such that the share of a representative*

[8] In the proof of Lemma 1, we show that this root indeed lies within the unit interval.

investor in the domestic project is decreasing in the belief, p^e, i.e., $\frac{\partial\alpha^*}{\partial p^e} < 0$, if and only if $\gamma \leq \hat{\gamma}$.

In forming a belief about future policy, an individual investor must form a belief about the behavior of other investors. This is because equilibrium policy is a direct response to the distribution of aggregate output between the investors and the voters. Lemma 1 implies that if their risk aversion is sufficiently low, investors place a greater weight on the growth effect when expecting a policy shift. So α^* decreases in p^e. If an individual investor expects that the choices of all others will induce a large aggregate α^*, then she also expects that a policy departure from the status quo will increase expected output. As a consequence, she is willing to invest even in exchange for a lower share of project output.

If, however, risk aversion exceeds $\hat{\gamma}$, more emphasis is placed on the risk effect induced by policy shifts. In this case, investors expect that the choices of others will result in a large aggregate α^*, thereby giving voters only a small share of output. Since this elicits a large policy shift, individually, investors therefore require a greater share of project output in order to invest, implying that their actions are strategic complements.

Assumption 2. *The risk-aversion coefficient satisfies $\gamma > \hat{\gamma}$.*

Proposition 4. *There exist two bounds, $\underline{\omega}$ and $\bar{\omega}$, where $\underline{\omega} < \bar{\omega}$, such that*

1. *if $\omega < \underline{\omega}$, there is a unique equilibrium at the status quo, $p_I^* = p_O^* = 0$, and the share of projects' output that accrues to the investors is $\alpha^* = \frac{\omega}{\pi_0}$;*

2. *for $\omega \in [\underline{\omega}, \bar{\omega}]$, there are multiple equilibra; in one equilibrium the status quo policy is selected, $p_I^* = p_O^* = 0$ and $\alpha^* = \frac{\omega}{\pi_0}$, while in any other equilibrium a risky policy, $p_I^* = p_O^* = p^* > 0$ and $\alpha^* > \frac{\omega}{\pi_0}$ is selected;*

3. *finally, for $\omega > \bar{\omega}$, there is a unique equilibrium with a risky policy, $p_I^* = p_O^* = p^* > 0$ and $\alpha^* > \frac{\omega}{\pi_0}$.*

Figure 4 illustrates Proposition 4. The solid curve depicts the winning policy schedule as a function of aggregate claims of investors, while the upward sloping dashed curves show combinations of p^e and α along which the representative investor breaks even. When the outside option is small, $\omega < \underline{\omega}$, investors only require a relatively small share of output as compensation. Since voters obtain a correspondingly large share of output, the growth effect of a marginal policy shift is small relative to the risk effect. In this case, the status quo policy is campaigned upon by both parties. But when $\omega > \bar{\omega}$, investors demand a much larger share of project output in return for investing. Voters, who must therefore contend with a relatively small share, are less inhibited by the risk effect of policy shifts and vote for risky gambles.

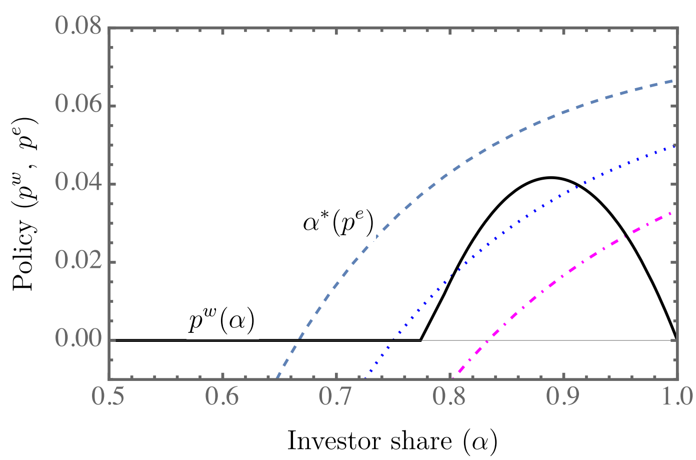


Figure 4: Equilibrium with unpredictable policy outcomes. As the outside option, ω, increases, the $\alpha^*(p^e)$ curve shifts to the right.

For $\omega \in [\underline{\omega}, \bar{\omega}]$, there are multiple self-fulfilling equilibria. In one equilibrium, the investors' beliefs coordinate on the status quo policy. If each investor believes that all other investors act on the belief that the median preferred policy is at the status quo, their output share becomes $\alpha^* = \omega/\pi_0$. This value of α^* leaves voters with a sufficiently large share of aggregate output under the status quo policy and the median preferred policy is indeed the status quo, vindicating initially held beliefs.

If, however, each investor believes that all others expect a policy shift, then their individually optimal response is to demand greater compensation, i.e., the share α^* increases above its status quo value. Since this lowers the aggregate stake for voters, the relative impact of the risk effect on their policy preferences is reduced. Voters vote in favor of policy shifts, thereby vindicating the investors' initial beliefs. Our analysis suggests, therefore, that the same fundamental parameters that support a status quo equilibrium can also support a politico-economic equilibrium with an unpredictable, risky policy.[9]

3.3 Incidence and size of policy gambles

We derive implications on how the incidence and size of (self-fulfilling) policy gambles depend on characteristics of the economy and the policy process. In particular, we focus on the effects of changes in the size of the status quo, π_0, and the degree of policy complexity, χ.

Proposition 5. *An increase in the value of the status quo, π_0:*

- *decreases the incidence of policy gambles: $\frac{\partial \bar{\omega}}{\partial \pi_0} > 0$, and $\frac{\partial(\bar{\omega}-\omega)}{\partial \pi_0} < 0$;*
- *but increases the size of policy gambles: $\frac{\partial p^*}{\partial \pi_0} > 0$.*

An increase in the degree of policy complexity, χ:

[9] In Section 5.2, we show that if the incumbent is forced to run on its record of the status quo policy that was initially in place, this leads to policy divergence under the policy gamble equilibrium.

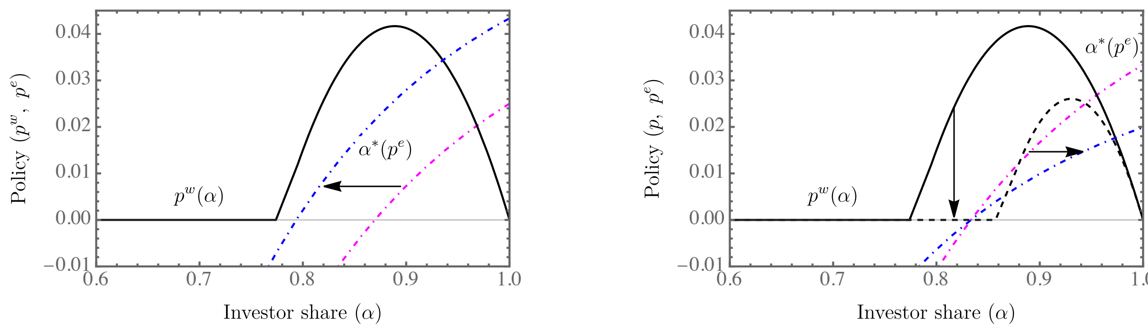
- *increases the incidence of self-fulfilling policy gambles:* $\frac{\partial \bar{\omega}}{\partial \chi} > 0$*, and* $\frac{\partial (\bar{\omega} - \underline{\omega})}{\partial \chi} > 0$;
- *but decreases the size of any policy gamble:* $\frac{\partial p^*}{\partial \chi} < 0$.

The value π_0 can be interpreted as reflecting a country's level of technological and economic development or its (per-capita) wealth. As such, Proposition 5 implies that, on the one hand, policy gambles occur less often in more advanced-economy countries. But, on the other hand, conditional on a winning party implementing a policy gamble, this deviation from the status quo is larger in size. This is because an increase in π_0 decreases the shares required by investors to invest. Accordingly, the participation constraint of investors shifts inwards and voters consider it relatively less risky to support larger policy gambles (Figure 5a).

The degree of policy complexity is a key variable in our model. It can be interpreted as representing the characteristics of the policy process that eventually shapes the outcome of the policy gamble. Following **?**, the parameter χ reflects the difficulties individuals face in mapping policies to expected outcomes. These difficulties may reflect concerns over the competence of political and bureaucratic institutions in implementing new policies.[10] Proposition 5 shows that, on the one hand, in an economy with less capable bureaucratic and political institutions, the economy is more exposed to self-fulfilling gambles, implying greater uncertainty about the election outcome. On the other hand, in such economies, policy deviations from established status quo, to the extent they occur, are generally smaller in size. This

[10] Drawing on our initial motivation, as a stylized example, consider a country where political parties are considering altering the status quo trade relationship with its neighbors. A small deviation from the status quo may reflect changes to existing treaties on the amount of goods to exempt from tariffs. An intermediate deviation may reflect introducing new barrier to trade. Finally, large deviations may reflect the tearing up of existing treaties and having to resort to trade wars. In this example, χ would reflect the country's diplomatic strength to push through what it wants, its expertise in negotiating trade deals and helping its firms cope with the policy changes.

is because an increase in χ implies that voters are less sure about the gains from a policy gamble. At the same time, greater unpredictability about the outcome of policy induces the investors to require a larger output share, with the effect that the participation constraint shifts outwards. The net effect is to reduce the size of the policy gamble (Figure 5a).



(a) Change in π_0 (b) Change in χ

Figure 5: Comparative statics for equilibrium with unpredictable policy outcomes.

4 Welfare and consensus politics

Our analysis shows that policy gambles can arise, when (i) policy outcomes are unpredictable ($\sigma > 0$); (ii) agents are sufficiently risk-averse ($\gamma > \hat{\gamma}$), thereby inducing strategic complementarities into investors' choices ($d\alpha/dp^e > 0$); and (iii) when the outside option facing investors is sufficiently large ($\omega \geq \underline{\omega}$). Moreover when $\omega \in [\underline{\omega}, \bar{\omega}]$, both, a policy gamble equilibrium and a status quo equilibrium are feasible outcomes. In this case, the policy gamble is self-fulfilling in the sense that the investors' beliefs about a deviation from status quo induces a distribution of output that leads voters to vote for the policy gamble. A crucial assumption for the self-fulfilling gamble to occur is that the incumbent government, at the time when the investors make investment decisions, cannot pre-commit to maintaining the status quo equilibrium into the future. The commitment problem creates a welfare cost for voters since the self-fulfilling gamble leads to lower aggregate welfare for voters compared to the status quo equilibrium.

To see this, we define social welfare in terms of voters' aggregate utility, i.e.,

$$W(p) \,=\, \int_0^{\lambda} u_i^C(\alpha^*(p),\, p)\,\mathrm{d}i\,, \tag{11}$$

where $\alpha^*(p)$ is the smallest solution to the investors' participation constraint.[11]

Proposition 6. *In the region $\omega \in [\underline{\omega}, \bar{\omega}]$, social welfare is strictly maximized under the status quo policy.*

The self-fulfilling policy gamble can be eliminated if investors can be convinced that future policy will not deviate from the status quo. Such behavior can be interpreted as a form of *consensus politics*, wherein the entire "political class" credibly pledges ex ante to a policy path into the future. For example, specific political institutions may foster consensus between political parties to pursue the status quo policy after the election.

In practice, achieving such political consensus requires government decision-making bodies to be non-adversarial and civil institutions to protect minority rights. For example, **?** highlights how, until the 1970s Anglican bishops actively worked in the House of Lords to promote consensus between legislatures and political parties. Moreover, attitudes towards 'fair-play' were enshrined in British public life through institutions or individuals acting as umpire or referee, e.g., judges, royal commissioners, the Speaker of the House of Commons, or even the Monarch. **?** and **?** argue that

[11] Including the aggregate utility of investors would amount to a shift of the welfare by ω without altering any of the trade-offs.

in Dutch and Belgian political systems, electoral losers are endowed with significant rights to participate in governmental decision making. These include electoral rules based on proportional representation and written constitutions that include minority vetos.

5 Extensions

In this section, we discuss four extensions to the model. In particular, we first consider the possibility of an equilibrium break-down due to a shift in the voters' bliss point distribution; second, we consider a change in political preferences whereby the incumbent derives an additional benefit from campaigning on the status quo (incumbency); third, we discuss the implication of allowing investors to vote; and fourth, we show how the electorate can become polarized following a policy gamble.

5.1 Ideology induced equilibrium breakdown

The analysis in the main text proceeded on the basis that the mean of voters' bliss point distribution is at the status quo policy, $p = 0$. As a result, the ideology effect induced, on average, a bias towards preferring the status quo. But if the bliss point distribution had a positive mean, $M > 0$, voters can become ideologically inclined to support policy gambles, despite the associated negative risk effects of such gambles. A sufficiently large ideological shift by voters can completely cut off any investment by investors and lead to the breakdown of equilibrium.

Proposition 7. *Given a mean of the bliss point distribution, $M > 0$, there exists a unique threshold $\hat{\omega}(M) > \bar{\omega}$ such that for all $\omega \leq \hat{\omega}(M)$, there exists at least one well* *defined equilibrium; while for $\omega > \hat{\omega}(M)$, there is no equilibrium with investment.*

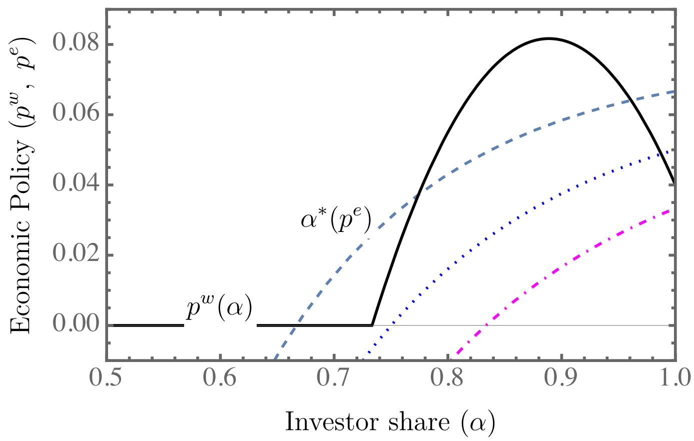


Figure 6: Ideology induced equilibrium breakdown. As the participation constraint shifts to the right, investment ceases when voters' ideological stance exceeds the investors' tolerance for policy gambles.

Figure 6 illustrates Proposition 7. For large ω and positive mean bliss point, $M > 0$, there is a breakdown of equilibrium. Intuitively, as investors entertain beliefs of large policy deviations, they require greater project shares as compensation. Their maximum tolerance for policy shifts is defined by the policy for which they obtain the entire project for themselves. In this situation, voters receive no share in output and so their policy choice is driven entirely by ideology. If the mean of voters' bliss points exceeds the maximum tolerance of investors for policy gambles, there cannot be an equilibrium. Moreover, since the participation constraint is decreasing as α is reduced from unity, and crosses zero without intersecting the winning policy schedule (since $\omega > \bar{\omega}$), while the winning policy schedule is increasing as α is reduced from unity, no further equilibrium can be obtained.

5.2 Incumbency and policy divergence

Our analysis thus far has assumed that both parties are free to choose their policy platforms. As a consequence, their policy platforms always converge in equilibrium. In what follows, we relax this assumption by drawing on the notion of *incumbency* as introduced by (**?**), wherein the incumbent's policy platform is fixed at the status quo. This may be motivated by stipulating that the incumbent always campaigns on its established record. Consequently, the incumbent would never entertain campaigning on any other policy. Moreover, to the extent that the status quo policy is built into existing frameworks and institutions, a departure from it would entail wholesale societal-level changes that engender an extremely (infinitely) large disutility from the incumbent.

Proposition 8. *If the median preferred policy is $p^w > 0$ and the incumbent is fixed at the status quo policy, $p_I = 0$, then the opposition party will win the election for sure by choosing any risky policy $p_O^* \in (0, p^w)$.*

If the median preferred policy is at the status quo, then the opposition party would also campaign on the status quo policy. In this case, the platforms of both the incumbent and opponent coincide. But, once the median preferred policy is $\widehat{p} > 0$, the equilibrium policy platforms diverge. While the incumbent captures all voters in the status quo voting bloc, the opposition party obtains a strictly larger share by campaigning on any risky policy, $0 < p_O^* < \widehat{p}$, that is smaller than the median preferred policy and always wins the election.

5.3 Allowing investors to vote

We can extend the above exercise to one where investors also participate in the election. Let each investor, $j \in [0, \lambda^I]$, have an ideological bliss point, $b_j^I \in \mathbb{R}$. The bliss points are drawn from a standard normal distribution. Conditional on investing, investor j's utility function is $u_j^I(\alpha, p) = \alpha \mathbb{E}[\pi(p)] - \gamma\, \alpha^2\, \sigma^2 \mathrm{Var}[\pi(p)] - \frac{1}{2}(p - b_j^I)^2$. Hence, if $b_j^I \leq -\bar{b}^I \equiv -\mu\alpha(1 - \gamma\chi\alpha)$, the investor prefers a policy $p \leq 0$. While, if $b_j^I \geq -\underline{b}^I \equiv -\mu\alpha(1 + \gamma\chi\alpha)$, the investor prefers a policy $p \geq 0$.

If, however, domestic investment does not take place (since $\lambda^I > 1$), investor j, invests in the outside option and obtains $\omega - \frac{1}{2}(b_j^I - p)^2$. In this case, the investor's preferred policy is simply given by their bliss point, and is not affected by how policy affects the economy's overall output.

Exploiting the normal distribution for the investors' bliss points, it follows that the probability distribution function of preferred policies amongst investors is $\hat{\phi}^I(p) = \phi\left(\frac{p - \underline{b}^I}{\sqrt{\lambda}^I}\right) 1_{p<0} + \phi\left(\frac{p - \bar{b}^I}{\sqrt{\lambda}^I}\right) 1_{p>0} + (\lambda^I - 1)\phi\left(\frac{p}{\sqrt{\lambda}^I}\right)$, with a mass of investors, $\phi\left(\frac{\bar{b}^I}{\sqrt{\lambda}^I}\right) - \phi\left(\frac{\underline{b}^I}{\sqrt{\lambda}^I}\right) + (\lambda^I - 1)\phi(0)$, who strictly prefer the status quo. Finally, given the masses λ and λ^I of voters and investors, the distribution of preferred policies across both groups is given by the mixture distribution $\frac{\lambda}{\lambda + \lambda^I}\hat{\phi}(p) + \frac{\lambda^I}{\lambda + \lambda_I}\phi^I(p)$, and the winning policy is $p^w = \max\{0, \frac{\lambda}{\lambda + \lambda^I}\bar{b} + \frac{1}{\lambda + \lambda^I}\bar{b}^I\}$, where $\frac{\lambda}{\lambda + \lambda^I}\bar{b} + \frac{1}{\lambda + \lambda^I}\bar{b}^I$ is quadratic in α with an inverted-U shape.

When making their investment decision, investors form rational expectations about the winning policy. The share of output that accrues to investors is determined as in the main text, implying that the qualitative nature of the equilibrium (as characterized in Proposition 4) remains unaffected. Finally, note that for sufficiently large λ and sufficiently small $\frac{\lambda^I}{\lambda + \lambda^I}$, the influence of the investors on the outcome of the election becomes negligible. Thus, one may interpret the situation in main text as one where the endowment needed to make the investment is owned by a rather small part of the overall population whose voting decisions are not important for the overall outcome of the election.

5.4 Polarizing nature of policy gamble

The main model proceeded from the assumption that only one point of the policy schedule is known to agents, namely the existing status quo. We now show that if more than one such point on the policy mapping is known, then policy gambles can lead to a polarization of the electorate. Suppose that two points of the policy schedule are known – the initial status quo $(0, \pi_0)$ and (g, π_g). Since the mapping from policies to outcomes is represented by the realized path of a Brownian motion, beliefs are no longer open-ended and anchored by one known point in the mapping, as in the core model. Instead, a *Brownian bridge* forms and beliefs are anchored by the two known points at either end of the bridge (**?**). On the flanks of the two known points, beliefs are open-ended, so that the expected outcome of a policy chosen following the election is

$$\mathbb{E}[\pi(p)] = \begin{cases} \pi_0 + \mu p & \text{if } p \in (-\infty, 0), \\ \pi_0 + \tilde{\mu}\, p & \text{if } p \in [0, g], \\ \pi_g + \mu(p - g) & \text{if } p \in (g, \infty), \end{cases}$$

where $\tilde{\mu} = (\pi_g - \pi_0)/g$ is the increase in output due to the gamble compared to the status quo, measured relative to the magnitude of the deviation from the status quo. Henceforth, we refer to $\tilde{\mu}$ as the 'bang for the buck' of policy g. The variance of policy outcomes is

$$\mathrm{Var}[\pi(p)] = \begin{cases} |p|\sigma^2 & \text{if } p \in (-\infty, 0), \\ \left|\frac{p(g-p)}{g}\right| \sigma^2 & \text{if } p \in [0, g], \\ |p-g|\sigma^2 & \text{if } p \in (g, \infty). \end{cases}$$

Along the Brownian bridge, i.e. for policies $p \in [0, g]$, the variance of policy outcomes is quadratic in p. This is in contrast to situations where beliefs are open-ended and the variance is linear in p.

Since the two points on the policy mapping are known, it follows that the distribution of preferred policies will exhibit two voting blocs – one around the $p = 0$ and another around $p = g$.

Abstract from the role of investors and setting $\alpha = 0$, the bliss-point thresholds for the $p = 0$ voting bloc are $\underline{b}$ and $\bar{b}$ (given in Equation (8) for $\alpha = 0$) while the thresholds for the voting bloc at $p = g$ are

$$\underline{b} \equiv \frac{\tilde{\mu}}{\lambda}\left[1 + \frac{\gamma\tilde{\chi}}{\lambda}\right] \quad \text{and} \quad \tilde{b} \equiv \frac{\tilde{\mu}}{\lambda}\left[1 - \frac{\gamma\tilde{\chi}}{\lambda}\right],$$

where $\tilde{\chi} = \sigma^2/\tilde{\mu}$.[12] Along the Brownian Bridge, a marginal change in the policy induces (i) a growth effect that is proportional to $\tilde{\mu} > 0$; (ii) a risk effect of size $-\gamma\sigma^2\left(1 - \frac{2p}{g\lambda^2}\right) \lessgtr 0$, and (iii) an ideology effect that is proportional to $-p < 0$. Since both the risk and ideology effects depend on p, their net effect determines how voters treat policies across the Brownian Bridge. We make the following assumption to ensure that there is no overlap between the two voting blocs.

[12]Taking investors reactions into account will strengthen our results.

Assumption 3. *The 'bang for the buck' of policy g satisfies:*

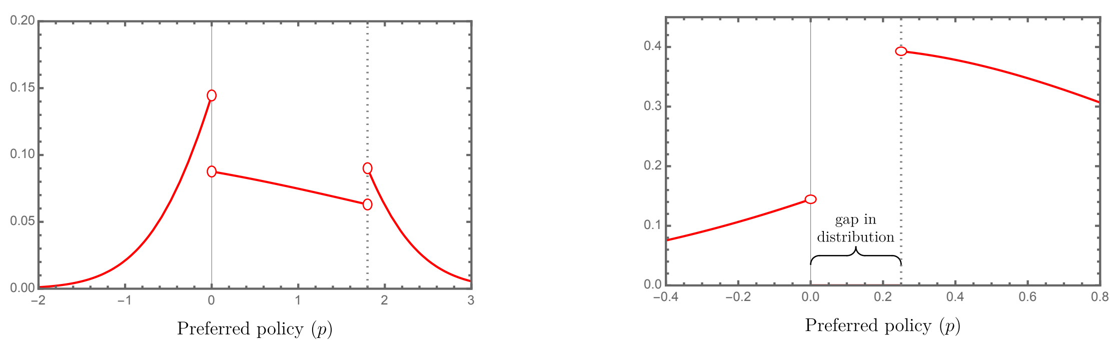
$$\tilde{\mu} \in \left(\mu - \frac{2\gamma\sigma^2}{\lambda}, \mu + \frac{2\gamma\sigma^2}{\lambda}\right).$$

Proposition 9. *Under Assumption 3 and if policy unpredictability is low, $\tilde{\chi} < \frac{g\lambda^2}{2\gamma\tilde{\mu}}$, then the distribution of preferred policies is a piecewise function,*

$$\widehat{\phi}(p) = \begin{cases} \phi\left(\frac{p-\underline{b}}{\lambda}\right) & \text{if} \quad p < 0 \\ \phi\left(\left(\frac{p-\hat{b}}{\lambda}\right)\left(1 - \frac{2\gamma\sigma^2}{g\lambda^2}\right)\right) & \text{if} \quad p \in (0, g) \\ \phi\left(\frac{p-\bar{b}}{\lambda}\right) & \text{if} \quad p > g \end{cases} \tag{12}$$

where $\hat{b} \equiv \left(\frac{\tilde{\mu}}{\lambda} - \frac{\gamma\sigma^2}{\lambda^2}\right) / \left(1 - \frac{2\gamma\sigma^2}{g\lambda^2}\right)$, and the two voting blocs are

$$(0, \Phi(-\tilde{b}/\lambda) - \Phi(-\underline{b}/\lambda)) \quad \textit{and} \quad \left(g, \Phi\left(\frac{g-\bar{b}}{\lambda}\right) - \Phi\left(\frac{g-\underline{b}}{\lambda}\right)\right).$$



(a) $\tilde{\chi} < \frac{g\lambda^2}{2\gamma\tilde{\mu}}$.

(b) $\tilde{\chi} > \frac{g\lambda^2}{2\gamma\tilde{\mu}}$.

Figure 7: Distribution of preferred policies under Brownian bridges

Figure 7a illustrates the distribution of preferred policies described in Proposition 9. If policy unpredictability is large, however, voters' sensitivity to the risk effect of a marginal changes in policy over the Brownian Bridge is greater than that of the ideology effect. And so the distribution of voters' preferred policies becomes polarized over the Brownian Bridge as Proposition 10 and Figure 7b make clear.

Proposition 10. *Under Assumption 3 and if policy unpredictability is large,* $\tilde{\chi} > \frac{g\lambda^2}{2\gamma\tilde{\mu}}$*, the distribution of preferred policies is given by*

$$\widehat{\phi}(p) = \begin{cases} \phi\left(\frac{p-\underline{b}}{\lambda}\right) & \text{if} \quad p < 0 \\ 0 & \text{if} \quad p \in (0, g) \\ \phi\left(\frac{p-\bar{b}}{\lambda}\right) & \text{if} \quad p > g \end{cases} \tag{13}$$

where the two voting blocs are

$$(0, \Phi(-\tilde{b}/\lambda) - \Phi(-\underline{b}/\lambda)) \quad \textit{and} \quad \left(g, \Phi\left(\frac{g-\bar{b}}{\lambda}\right) - \Phi\left(\frac{-\tilde{b}}{\lambda}\right)\right).$$

Figures 8a and 8b illustrate the ordering of the bounds of voters' bliss points and the corresponding voting blocs implied by Propositions 9 and 10. The panels make clear that when policy unpredictability is large, voters who would have supported a small departure from the status quo (between 0 and g) now all prefer to move to the voting bloc that favors the gamble at $t = 1$.

Figure 8 illustrates that when policy unpredictability is large, voters become 'polarized, in that their preferred policies coalesce around the two ends of the Brownian Bridge. Even small deviations in policy from either the status quo or the initial gamble are too uncertain for risk-averse voters who therefore prefer policies with certain outcomes. Whether voters who preferred $p \in (0, g)$ when policy unpredictability was smaller, now choose the status quo policy or the initial gamble, depends on the relationship of the growth and their ideology effects. To the extent that support shifts towards the initial gamble ahead of future elections, policy gambles can become serial in nature.

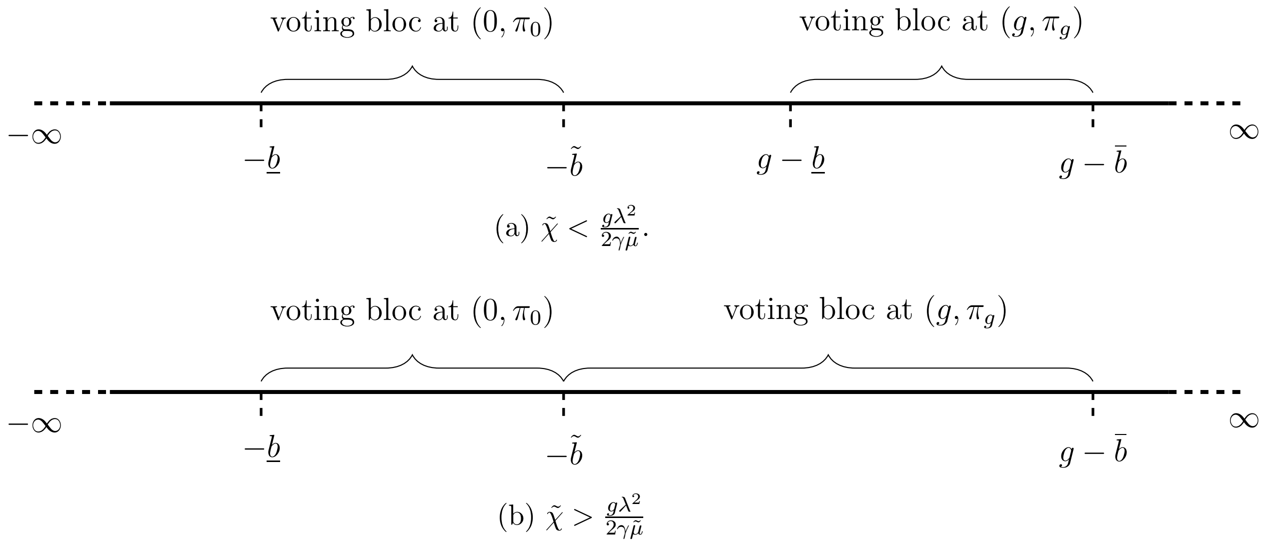


Figure 8: Ordering of bliss-point thresholds for voting blocs.

6 Discussion

Our model provides a theoretical framework to analyze policy gambles. It suggests that rational agents' support for policy gambles can be driven by self-fulfilling beliefs about future policy. Central to our view on policy gambles are three key assumptions: (i) an inability of the incumbent government to pre-commit to the status quo policy; (ii) an unpredictable mapping from policies to outcomes, and (iii) a conflict over the division of economic output in society. In what follows, we re-visit the roles played by the key elements of our framework and their possible relevance in Brexit. A thorough account of Brexit and its different driving factors is beyond the scope of this paper. Instead, our high-level goal is to describe how some of the events surrounding Brexit map into the three key factors for a policy gamble.

Incumbent's inability to pre-commit to the status quo policy. In our model, investors are confronted with a commitment problem. When investment decisions are made, the incumbent government cannot credibly pledge that the status quo policy will be retained into the future. The policy is instead determined during subsequent elections where voters' support for policy shifts are shaped by their share of aggregate output. Importantly, since both political parties only care about winning the election, they are not beholden to pledge maintaining the status quo. In fact, our results would also hold if the incumbent pledged to stick with the status quo, while the opponent would not.

The commitment problem was a key element in the process that predated the Brexit referendum. Deep skepticism about the benefits of EU membership has been a central feature of British politics ever since the UK joined the European Community in 1973 and voted to "remain" in the referendum of 1975. Strident opposition to European integration within the Conservative Party and the fear of being ousted as Prime Minister prompted then Prime Minister David Cameron to initiate a referendum on EU membership in 2016 (**?**).

The decision to hold the referendum also stemmed from a breakdown of consensus-style politics that came to dominate the post-war period, from 1945-79, where there was broad willingness to compromise between social welfare provision and market forces (**?**). The election of Margret Thatcher in 1979 set a tone that broke increasingly with the consensual note of the past. By braving short-term dissension she was able to shift the political agenda and revive economic individualism, bringing the benefits of international capital and transforming British politics in the process (**??**). **?** suggests that Thatcher-style 'conviction' politics came at the expense of ethics, namely the duty of responsibility of politicians to care about the consequences (intended or unintended) of their actions.

Unpredictable mapping from policy to outcomes. Following ??, the mapping from policies to outcomes is uncertain. The further that policy deviates from the status quo, the greater the uncertainty in the output. Voters are sensitive to shifts in the riskiness of aggregate output and, especially when they command a large output share, can become averse to policy shifts. In this case, a voting bloc forms around the status quo policy. investors are also sensitive to shifts in the riskiness of output, which is why they demand larger shares of output when they expect policy shifts. If, however, all policy outcomes were predictable, voters would not be subject to the risk effect and there would be no voting blocs. Similarly, investors would react to policy shifts by requiring smaller shares of output instead.

The Brexit debate also showed how the mapping from policy to outcomes can be both complex and far from clear-cut.[13] The policy space spanned a range of withdrawal options – from a no-deal Brexit to a variety of schemes for accessing the European market. These schemes ranged from the "Norway model", entailing membership of the European Economic Area and granting British firms full access to the single market, to a "Canada-style" deal, with preferential access to the single market but with some exceptions (e.g. to financial services). To the extent that some of those schemes were closer to the preexisting arrangement with the EU, their outcomes were clearly better predictable than that of more distinct proposals.

Conflict over the division of output in society. At root, our framework illustrates how the sharing of economic output (between investors and voters) and growing output by means of risky policy shifts (through government policy) are intertwined

[13]In a statement to the House of Commons on 22 February 2016, Prime Minister David Cameron argued that, "*if the British people vote to leave...this cannot be described as anything other than risk, uncertainty and a leap in the dark that could hurt working people in our country for years to come.*"

in equilibrium. While a larger share of output compensates investors and ensures their continued participation, it comes at the expense of reducing the share of output available to voters.

To the extent that this reduced share of output translates into reduced social outcomes, such as public services, it can be interpreted as fiscal austerity. **?** provides evidence to suggest that the austerity-induced withdrawal of the welfare state since 2010 was a key factor behind the Brexit referendum result and, hence, the decline of the pro-status quo voting bloc. Related empirical evidence is also provided by **?** and **?**. The **?** documents that those who self-identify themselves as being in the 'working class' (approximately 60% of respondents), see society as divided between a large disadvantaged group and a small privileged elite. Politicians supporting Brexit also emphasized how the status quo advocated by the incumbent government responsible for this austerity was "...overwhelmingly in the interests of big business and against the interests of workers".[14]

7 Concluding Remarks

Our model offers a novel explanation for why voters sometimes support risky and untested policy shifts away from a well-established status quo. When policies are unpredictable, a simple political friction – the inability of an incumbent politician to commit to a policy stance – interacts with the behavior of investors and voters, who face a conflict over the distribution of economic output, to endogenously give rise to (self-fulfilling) policy gambles.

The median voter model adopted in our framework has limitations. In partic-

[14] Advertisement by the Vote Leave campaign: https://goo.gl/UtX2QG.

ular, future research might usefully explore the role of political competition, in the form of third parties and political entrepreneurs, in provoking policy gambles. Our model also supposes that agents are certain about the drift and slope parameters of the (stochastic) policy process. Imperfect information about these allows for possible disagreements about the nature of the policies rather than the outcomes. Allowing for richer dynamics may also inform our understanding of policy experimentation – governments may be able to gamble with policy and learn from the information generated before deciding whether to change course mid-way. We leave exploration of these topics for future work.

References

Appendix

A Proofs

A1 Proof of Proposition 1

The policy that maximizes the median voter's utility, given the investors' share α, can be derived from equation (3) in the main text for $\sigma^2 \to 0$, taking into account that the median bliss point $b_m = 0$. Hence, the median voter's preferred policy is given by

$$p^w(\alpha) = \frac{1-\alpha}{\lambda}\mu.$$

Consider the investor's choice of α at $t = 0$ for given expectations about the policy outcome, p^e. The representative investor's participation constraint, for $\sigma^2 - \to 0$, is given by:

$$\alpha \mathbf{E}[\pi(p^e)] = \omega.$$

The latter can be solved for α:

$$\alpha^*(p^e) = \frac{\omega}{\pi_0 + \mu p^e}.$$

By imposing rational expectations, $p^e = p^*$, the policy p^* and the investor's share α^* are the solution to the system of two equations:

$$\alpha = \frac{\omega}{\pi_0 + \mu p} \quad \text{and} \quad \alpha = 1 - \frac{\lambda}{\mu}p.$$

Thus, combining the last two equations, it follows that p^* satisfies the quadratic equation:

$$\mu p^2 + \left(\pi_0 - \frac{\mu^2}{\lambda}\right) p - \frac{\mu\pi_0}{\lambda}\left(1 - \frac{\omega}{\pi_0}\right) = 0.$$

Because $\alpha = 1 - \lambda p/\mu \in [0,1]$, the relevant solution must be positive. Since $-\frac{\pi_0}{\lambda}\left(1 - \frac{\omega}{\pi_0}\right) < 0$, the quadratic equation has a unique positive root given by

$$p^* = \frac{\frac{\mu^2}{\lambda} - \pi_0}{2\mu} + \frac{\sqrt{\left(\frac{\mu^2}{\lambda} - \pi_0\right)^2 + \frac{4\pi_0\mu^2}{\lambda}\left(1 - \frac{\omega}{\pi_0}\right)}}{2\mu}.$$

Defining Λ as in the Proposition allows to write $p^* = \frac{\mu}{2\lambda}(1 - \Lambda)$ and substituting p^* into $\alpha^* = 1 - \lambda p/\mu$ yields $\alpha^* = \frac{1}{2}(1 + \Lambda)$.

□

A2 Proof of Proposition 2

Consider a voter with bliss point b_i. This voter prefers a non-positive policy $p \leq 0$ if and only if

$$\left.\frac{\partial u_i(\alpha, p)}{\partial p}\right|_{p \downarrow 0} \leq 0.$$

Using equation (3) in the main text, this implies that any voter with bliss point

$$b_i \leq -\bar{b} \equiv -\mu\left(\frac{1-\alpha}{\lambda}\right)\left(1 - \gamma\chi\left(\frac{1-\alpha}{\lambda}\right)\right)$$

prefers a policy $p \leq 0$ over any positive policy. Similarly, a voter with bliss point b_i prefers a policy $p \geq 0$ over any negative policy if and only if:

$$\left.\frac{\partial u_i(\alpha, p)}{\partial p}\right|_{p\uparrow 0} \geq 0 \;\Leftrightarrow\; b_i \geq -\underline{b} \equiv -\mu\left(\frac{1-\alpha}{\lambda}\right)\left(1+\gamma\chi\left(\frac{1-\alpha}{\lambda}\right)\right).$$

For any policy $p < 0$, it follows from the first-order condition for a voter with bliss point $b_i < p - \underline{b}$ that he prefers any policy $p' < p$ over p. Similarly, for any $p > 0$, a voter with bliss point $b_i > p - \bar{b}$ prefers any $p' > p$ over p. Since bliss points are standard-normally distributed, the mass of voters who prefer a policy $p < 0$ is given by $\phi(p - \underline{b})$. Similarly, the mass of voters how prefer a policy $p > 0$ is $\phi(p - \bar{b})$. The distribution of preferred policies is therefore equivalent to a piecewise normal distribution composed of a distribution with mean / median $\underline{b}$, $\phi(p - \underline{b})$, for $p < 0$, a distribution with mean / median $\bar{b}$, $\phi(p - \bar{b})$, for $p > 0$. The mass of voters who prefer the status quo over any policy $p \neq 0$ is thus $\Phi(-\bar{b}) - \Phi(-\underline{b})$. Since $\underline{b} > 0$, the median of $\hat{\phi}$ must be non-negative and thus equals $p^m = \max\left\{0, \bar{b}\right\}$. □

A3 Proof of Proposition 3

Fix $\alpha \in (0,1)$ and let $p^m = p^m(\alpha) \in \mathbb{R}$ denote the median of the distribution of preferred policies. Denote the parties' policies by p_I and p_O. Note that the distribution of preferred policies can be used to express the share of voters who prefer policy p' over any larger policy $p > p'$ as $\hat{\Phi}(p')$. We can thus express the number of votes in favour of I in terms of p_I and p_O as:

$$\nu_I(p_I, p_O) = \begin{cases} \frac{\lambda}{2}\left(\hat{\Phi}(p_I) + \hat{\Phi}(p_O)\right) & \text{if } p_I \leq p_O \\ \lambda - \frac{\lambda}{2}\left(\hat{\Phi}(p_I) + \hat{\Phi}(p_O)\right) & \text{if } p_I > p_O \end{cases}$$

while the number of votes for O equal $\nu_O = \lambda - \nu_I(p_I, p_O)$. Suppose without loss of generality that $p_I < p_O$ and assume that $\nu_I(p_I, p_O) < \lambda/2$. It follows that $p_I < p^m$ and $\nu_I(p_I, p_O) < \nu_O(p_I, p_O)$. By equation (4) in the main text, O wins the election with probability 1. To flip the election outcome, I must increase its policy to $p'_I \in [p^m, p_O)$ which implies that I obtains a number of votes $\nu_I(p'_I, p_O) \geq \lambda/2$ and wins the election. O best-replies to I's new policy p'_I by lowering its policy to $p'_O \in [p^m, p'_I)$. I, in turn, best-replies to p'_O with $p''_I \in [p^m, p'_O)$ and so on. This best-reply iteration continues until $p^*_I = p^m = p^*_O$ and, by equation (4) in the main text, both parties have an equal chance of winning the election with votes $\nu_I(p^m, p^m) = \lambda/2 = \nu_O(p^m, p^m)$. Neither I nor O have an incentive to deviate from $p^*_I = p^m = p^*_O$. If either party increases (decreases) its policy, then the other party obtains a vote share larger than 1/2 and clearly wins the election. Thus, $p^w(\alpha) = p^m = \max\{0, \bar{b}\}$. $\square$

A4 Proof of Lemma 1

The representative investor's share in a project is given by the solution to

$$A(\alpha, p^e) \equiv \alpha\left(\pi_0 + \mu p^e\right) - \gamma\alpha^2\sigma^2|p^e| - \omega = 0$$

Since investors compete for investing into the project we can restrict attention to the smaller of the two roots. Note that both roots are strictly positive since $A(0, p) < 0$. However, it is possible that both roots are strictly larger than unity, implying that no solution exists. We return to this case below. Thus, suppose first that the smaller root, α^*, lies in the unit interval. Then, we must have $\partial A/\partial\alpha > 0$. By the implicit function theorem,

$$\frac{\partial\alpha^*}{\partial p^e} < 0 \;\Leftrightarrow\; \gamma < \frac{1}{\alpha^*\chi}.$$

Suppose that $\gamma < \frac{\pi_0}{\omega\chi}$. Then $\left.\frac{\partial\alpha^*}{\partial p^e}\right|_{p^e=0} < 0$ and therefore $\gamma < \frac{1}{\alpha^*\chi}$ for all $\alpha^* > \alpha^*(0)$. Conversely, suppose that $\gamma > \frac{\pi_0}{\omega\chi}$. Then $\left.\frac{\partial\alpha^*}{\partial p^e}\right|_{p^e=0} > 0$ and therefore $\gamma > \frac{1}{\alpha^*\chi}$ for all $\alpha^* > \alpha^*(0)$. Thus, α^* increases in p^e if and only if $\gamma > \hat{\gamma} = \frac{\pi_0}{\omega\chi}$.

To ensure that $\alpha^* \in [0,1]$, we must ensure that $A(1) \geq 0$. The latter condition is equivalent to $\pi_0 + \mu p^e - \gamma\sigma^2|p^e| - \omega$. Since $p^* \geq 0$, whenever $\gamma < \hat{\gamma}$, a sufficient condition for $A(1) \geq 0$ is $\pi_0 - \omega \geq 0$ which is satisfied by assumption. If, however, $\gamma > \hat{\gamma}$, then an equilibrium only exists whenever $p \leq \bar{p} \equiv \frac{\pi_0 - \omega}{\gamma\sigma^2 - \mu}$. For any policy $p > \bar{p}$, investors never invest in domestic projects but always into their outside option. Thus, a policy $p > \bar{p}$ cannot constitute an equilibrium with investment. □

A5 Proof of Proposition 4

We consider the case where $\gamma > \hat{\gamma}$. An equilibrium is given by the intersection between the investor's required share $\alpha^*(p^e)$, which is the solution to $A(\alpha, p^e) = 0$, and the policy schedule $p = p^w(\alpha)$ under the assumption of rational expectations, $p^e = p$. Note first that the status quo cannot be an equilibrium whenever

$$p^w\left(\frac{\omega}{\pi_0}\right) > 0 \quad \Leftrightarrow \quad \omega > \bar{\omega} \equiv \pi_0\left(1 - \frac{\lambda}{\gamma\chi}\right).$$

Thus, for $\omega > \bar{\omega}$, the winning policy $p^w(\alpha)$ is strictly positive and $\alpha^* > \omega/\pi_0$.

Next, suppose that $\omega \leq \bar{\omega}$. Then, the status quo is always an equilibrium.

Denote by $\hat{\alpha}$ the value of α that maximizes $p^w(\alpha)$:

$$\hat{\alpha} = 1 - \frac{\lambda}{2\gamma\chi} \quad \text{and} \quad \hat{p} \equiv p^w(\hat{\alpha}) = \frac{\mu}{4\gamma\chi}.$$

Whenever $A(\hat{\alpha}, \hat{p}) > 0$, then the status quo is the only equilibrium (see Figure (4) in the main text). The respective condition becomes:

$$\omega < \underline{\omega} \equiv \left(1 - \frac{\lambda}{2\gamma\chi}\right)\left(\pi_0 - \frac{\mu}{4\gamma\chi}\left(\sigma^2\gamma\left(1 - \frac{\lambda}{2\gamma\chi}\right) - \mu\right)\right).$$

Thus, for $\omega \in (\underline{\omega}, \bar{\omega})$, there are multiple equilibria, depending on the beliefs of investors about the aggregate behavior of other investors and therefore about future policies. In particular, if investors believe that $p^w = 0$, then they all accept a share ω/π_0 and the equilibrium policy will be status quo. If, however, investors believe that a deviation from the status quo occurs, they require a share $\alpha^* > \omega/\pi_0$ to invest. As a consequence, voters are not content with the status quo policy and the equilibrium policy will be $p^* > 0$. □

A6 Proof of Proposition 5

Differentiating the expressions for $\bar{\omega}$ and $\underline{\omega}$ (see Proof of Proposition 4) shows that both thresholds are strictly increasing in π_0. Moreover, $\underline{\omega}$ increases in π_0 at a faster rate than $\bar{\omega}$, implying that the difference $\bar{\omega} - \underline{\omega}$ strictly decreases in π_0.

Furthermore, note that an increase in π_0 only affects the investors' break-even condition, but has no effect on the voters' preferred policy. If π_0 increases, α^* decreases, i.e., the $\alpha^*(p^e)$ curve shifts to the left along the optimal policy curve (see Figure 5a), implying that the size of any policy gamble increases.

Next, consider the derivatives with respect to χ. From the expression for $\bar{\omega}$ follows immediately that $\bar{\omega}$ strictly increases in χ. To consider how $\bar{\omega} - \underline{\omega}$ changes with χ, it is useful to write $\underline{\omega}$ in terms of $\hat{\alpha}$.

$$\underline{\omega} = \hat{\alpha}(\pi_0 - \frac{\hat{\alpha}\mu^2}{4\gamma\chi}(\gamma\chi - 1)).$$

Differentiating with respect to χ yields:

$$\frac{\partial \underline{\omega}}{\partial \chi} = \frac{\partial \hat{\alpha}}{\partial \chi}\left(\frac{\underline{\omega}}{\hat{\alpha}\pi_0} - \frac{\hat{\alpha}\mu^2}{4\gamma\chi}(\gamma\chi - 1)\right) - \frac{\hat{\alpha}^2\mu^2}{4\gamma\chi^2}.$$

Moreover, we can write $\bar{\omega} = \hat{\alpha}\pi_0 - \frac{\lambda\pi_0}{2\gamma\chi}$ with derivative

$$\frac{\partial \bar{\omega}}{\partial \chi} = \frac{\partial \hat{\alpha}}{\partial \chi} + \frac{\lambda\pi_0}{2\gamma\chi^2}.$$

And therefore we obtain:

$$\frac{\partial(\bar{\omega} - \underline{\omega})}{\partial \chi} = \frac{\partial \hat{\alpha}}{\partial \chi}\left(\frac{\hat{\alpha}\pi_0 - \underline{\omega}}{\hat{\alpha}\pi_0} + \frac{\hat{\alpha}\mu^2(\chi\gamma - 1)}{4\gamma\chi}\right) + \frac{\lambda\pi_0}{2\gamma\chi^2}\left(1 + \frac{\hat{\alpha}^2\mu^2}{2\lambda\pi_0}\right) > 0$$

which is strictly positive because $\hat{\alpha}\pi_0 > \underline{\omega}$, $\gamma\chi > 1$ and $\frac{\partial \hat{\alpha}}{\partial \chi} > 0$.

Finally, consider the effect of an increase in ξ on the investors' break-even condition. If χ increases (either because σ^2 increases or μ decreases), the break-even constraint shifts to the right and $\alpha(p^e)$ increases. At the same time, an increase in χ decreases voters' preferred policy. As a consequence, α^* must increase and any $p^* > 0$ must decrease.

□

A7 Proof of Proposition 6

We first show that the welfare function is strictly concave in p, taking into account the dependency of α on p through the participation constraint. Second, we show that the welfare function peaks at $p = 0$. Together, the first and the second point imply that welfare is maximized at the status quo.

Abusing notation, we write α for $\alpha(p)$ in the following derivations. The first derivative of the welfare function is given by:

$$W'(p) = (1-\alpha)\mu - \gamma\sigma^2 \left(\frac{(1-\alpha)^2}{\lambda}\right)\frac{\partial|p|}{\partial p} - \lambda p + \frac{d\alpha}{dp}\left(-\mathbf{E}[\pi(p)] + \frac{2\gamma\sigma^2|p|(1-\alpha)}{\lambda}\right).$$

The second derivative is given by:

$$W''(p) = -\lambda - 2\left(\mu - \frac{2\sigma^2\gamma(1-\alpha)}{\lambda}\frac{\partial|p|}{\partial p}\right)\frac{d\alpha}{dp} - \Psi(\alpha,p)\frac{d^2\alpha}{dp^2} - \frac{2\sigma^2\gamma|p|}{\lambda}\left(\frac{d\alpha}{dp}\right)^2 \tag{A1}$$

where $\Psi(\alpha, p) \equiv \mathbf{E}[\pi(p)] - \frac{2\sigma^2\gamma(1-\alpha)|p|}{\lambda}$.

From the proof of Proposition 3:

$$\frac{d\alpha}{dp} = \frac{\alpha\left(\alpha\gamma\sigma^2\frac{\partial|p|}{\partial p} - \mu\right)}{\Gamma(\alpha,p)}, \tag{A2}$$

where $\Gamma(\alpha, p) =\equiv \mathbf{E}[\pi(p)] - 2\sigma^2\gamma\alpha|p|$. An application of the implicit function theorem to $\frac{d\alpha}{dp}$ yields:

$$\begin{aligned}\frac{d\alpha^2}{dp^2} &= \frac{1}{\Gamma(\alpha,p)^2}\left[2\left(2\gamma\sigma^2\alpha\frac{\partial|p|}{\partial p}-\mu\right)\left(\alpha\gamma\sigma^2\frac{\partial|p|}{\partial p}-\mu\right)\alpha+\frac{d\alpha}{dp}\left(\gamma\sigma^2\alpha-\mu\right)2\gamma\sigma^2|p|\alpha\right]\\ &= \frac{1}{\Gamma(\alpha,p)}\left[2\frac{d\alpha}{dp}\left(2\gamma\sigma^2\alpha\frac{\partial|p|}{\partial p}-\mu\right)+2\left(\frac{d\alpha}{dp}\right)^2\gamma\sigma^2|p|\alpha\right] \qquad \text{(A3)}\end{aligned}$$

Substituting expression (A3) into (A1), we can write the second derivative of the welfare function as:

$$\begin{aligned}W''(p) &= -\lambda-2\left(\mu-\frac{2\sigma^2\gamma(1-\alpha)}{\lambda}\frac{\partial|p|}{\partial p}\right)\frac{d\alpha}{dp}-\Psi(\alpha,p)\frac{d^2\alpha}{dp^2}-\frac{2\sigma^2\gamma|p|}{\lambda}\left(\frac{d\alpha}{dp}\right)^2\\ &= -\lambda-2\left(\mu-\frac{2\sigma^2\gamma(1-\alpha)}{\lambda}\frac{\partial|p|}{\partial p}\right)\frac{d\alpha}{dp}-\frac{2\Psi(\alpha,p)}{\Gamma(\alpha,p)}\frac{d\alpha}{dp}\left(2\gamma\sigma^2\alpha\frac{\partial|p|}{\partial p}-\mu\right)\\ &\quad -\frac{2\Psi(\alpha,p)}{\Gamma(\alpha,p)}\frac{2\sigma^2\gamma|p|}{\lambda}\frac{d\alpha}{dp}\\ &= \Omega(\alpha,p)+\frac{2\frac{d\alpha}{dp}}{\Gamma(\alpha,p)}\left(\Gamma(\alpha,p)\left(\frac{2(1-\alpha)\sigma^2\gamma\frac{\partial|p|}{\partial p}}{\lambda}-\mu\right)-\Psi(\alpha,p)\left(2\gamma\sigma^2\alpha\frac{\partial|p|}{\partial p}-\mu\right)\right)\\ &= \Omega(\alpha,p)+\frac{4\sigma^2\gamma\pi_0\frac{d\alpha}{dp}}{\Gamma(\alpha,p)}\left(\frac{1-\alpha}{\lambda}-\alpha\right)<0 \qquad \text{for all } p>0,\end{aligned}$$

where the inequality follows because the last term is negative since $\omega/\pi_0 > 1/(1+\lambda)$ and

$$\Omega(\alpha,p)\equiv -1-\left(\frac{2\sigma^2\gamma|p|}{\lambda}+\frac{\Psi(\alpha,p)}{\gamma(\alpha,p)}2\gamma\sigma^2|p|\right)\left(\frac{d\alpha}{dp}\right)^2 < 0 \qquad \text{for all } p>0.$$

For the second step, consider $\omega \in (\underline{\omega}, \bar{\omega})$. As $\omega < \bar{\omega}$, the status quo is an equilibrium, implying that

$$(1-\alpha(0))\mu\left(1-\lim_{p\downarrow 0}\left(\frac{\gamma\chi(1-\alpha(0))}{\lambda}\frac{\partial|p|}{\partial p}\right)\right)<0.$$

Thus, the limit of $W'(p)$, when p approaches 0 from the right is

$$\lim_{p\downarrow 0} W'(p) = (1-\alpha(0))\mu\left(1 - \lim_{p\uparrow 0}\left(\frac{\gamma\chi(1-\alpha(0))}{\lambda}\frac{\partial|p|}{\partial p}\right)\right) - \pi_0 \lim_{p\downarrow 0}\frac{d\alpha}{dp} < 0.$$

Consider the limit of $W'(p)$ when p approaches 0 from the left. Note that, from expression (A2), $\lim_{p\uparrow 0}\frac{d\alpha}{dp} < 0$. Hence, we have

$$\lim_{p\uparrow 0} W'(p) \;=\; (1-\alpha(0))\mu\left(1 - \lim_{p\uparrow 0}\left(\frac{\gamma\chi(1-\alpha(0))}{\lambda}\frac{\partial|p|}{\partial p}\right)\right) - \pi_0 \lim_{p\uparrow 0}\frac{d\alpha}{dp} > 0.$$

Thus, whenever $\omega \in (\underline{\omega}, \bar{\omega})$, the welfare function has a peak at the status quo policy $p = 0$ and is strictly concave in p for $p > 0$. Therefore, welfare is maximized at $p = 0$. □

A8 Proof of Proposition 7

With a positive mean, $M > 0$ for the bliss-point distribution, it follows that the winning policy, if investors demand the entire project output as compensation, $\alpha = 1$, is given by $p^w = M$. From the representative investor's participation constraint, we obtain that it is feasible for the investor to invest, $\alpha \leq 1$, as long as their expectation for the policy shift, i.e., their maximum tolerance, satisfies $p^e \leq \frac{\pi_0 - \omega}{\mu(\gamma\chi - 1} > 0$. Thus, as long the maximum tolerance is less than the winning policy when voters solely base their decisions based on ideology, then we obtain at least one well defined equilibrium. This requires that $\frac{\pi_0-\omega}{\mu(\gamma\chi-1)} > M$, or

$$\omega < \hat{\omega}(M) \equiv \pi_0 + M\mu(1-\gamma\chi)\,.$$

A9 Proof of Proposition 8

The proposition follows immediately from the discussion in section 5.3.

A10 Proof of Propositions 9 and 10

We begin by considering the preferred policy of a voter with bliss point b_i. For $p < 0$, the marginal utility of policy p for voter i is given by:

$$u_i'(p) \;=\; \frac{\mu}{\lambda} + \frac{\gamma\sigma^2}{\lambda^2} - p + b_i$$

Note that, due to single-peakedness of preferences, voter i prefers a non-negative policy if and only if

$$\lim_{p\uparrow 0} u_i'(p) \;= \frac{\mu}{\lambda} + \frac{\gamma\sigma^2}{\lambda^2} + b_i \;\geq\; 0 \quad\Leftrightarrow\quad b_i \geq -\underline{b}.$$

For $p \leq 0$, the first-order condition induces a distribution over preferred policies that is normal with mean $\underline{b}$ and unit variance.

For $p \in (0, g)$, the marginal utility is given by:

$$u_i'(p) \;=\; \tilde{b} + b_i - p\left(1 - \frac{2\gamma\sigma^2}{\lambda^2 g}\right)$$

Voter i prefers a non-positive policy if and only if

$$\lim_{p\downarrow 0} u_i'(p) \;\leq 0 \quad\Leftrightarrow\quad b_i < -\tilde{b}.$$

Suppose that $g > \frac{2\gamma\sigma^2}{\lambda^2}$. Then, for $p \in (0, g)$, the first-order condition yields a well-defined preferred policy for voter i:

$$p_i^* = \frac{\tilde{b} + b_i}{\left(1 - \frac{2\gamma\sigma^2}{\lambda^2 g}\right).}$$

For $p \in (0, g)$, the distribution of preferred policies follows a normal distribution with mean $\hat{b}$ and variance $\left(1 - \frac{2\gamma\sigma^2}{\lambda^2 g}\right)^{-2}$. Note that voter i prefers a policy that is at least as large as g if and only if

$$\lim_{p \uparrow g} u_i'(p) \; > 0 \quad \Leftrightarrow \quad b_i > g - \underline{b}.$$

Next, consider the voter's marginal utility for $p > g$,

$$u_i'(p) \; = \; \bar{b} + b_i - p.$$

Voter i prefers a policy that is at most g if and only if

$$\lim_{p \downarrow g} u_i'(p) \; \leq 0 \quad \Leftrightarrow \quad b_i < g - \bar{b}.$$

The first-order condition induces a distribution of preferred policies for $p > g$ that is normal with mean $\bar{b}$ and unit variance.

Taken together, for $g > \frac{2\gamma\sigma^2}{\lambda^2}$, the distribution of preferred policies is piecewise normal (as stated in the Proposition) and admits two voting blocs. The first voting bloc is around the status quo policy. The mass of agents who prefer the status quo policy $p = 0$ over any other policy, regardless of their bliss point is given by $\Phi(-\tilde{b}/\lambda) - \Phi(\underline{b}/\lambda)$. The second voting bloc occurs around the initial gamble, given its now-known outcome. The mass of voters who prefer g, regardless of their bliss point is given by $\Phi((g-\overline{b})/\lambda) - \Phi((g-\underline{b})/\lambda)$.

Next, consider the case where $g \leq \frac{2\gamma\sigma^2}{\lambda^2}$. Note first that this case does not change the distribution of preferred policies for $p < 0$ and $p > g$. However, the first-order condition for $p \in (0, g)$ does not admit a well-defined maximum in $(0, g)$ anymore. In fact, the marginal utility is strictly positive (since the coefficient that multiplies into p is strictly negative). As a consequence, any voter with bliss point $b_i \in (-\tilde{b}, g - \underline{b})$ strictly prefers g over any smaller policy. Thus, the distribution of preferred policies puts zero probability mass on $p \in (0, g)$. The voting bloc around g stretches out; the mass of voters who prefer g over any other policy, regardless of their bliss point is now given by: $\Phi((g-\overline{b})/\lambda) - \Phi(-\tilde{b}/\lambda)$. □