Evolution of Risk and Political Regimes*

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Abstract

We analyze the interaction between a government and citizens in which, in each period, the government has an option to predate. Citizens prefer a government that is competent and non-predatory and strive to replace ones that are not. Regimes differ in the degree to which citizens can succeed in doing so. In pure democracies, citizens can displace incumbent governments; in pure autocracies, they cannot; and in intermediate cases, they can do so in probability. After economic downturns, the posterior probability that the government is competent and benevolent declines. According to the model, in intermediate regimes, but not in others, governments can separate by type. The implication, then, is that these regimes are politically and economically more volatile, with higher levels of variation in assessments of political risk and in economic performance. We test our argument by measuring the impact of economic downturns on the perceived risk of political expropriation in different regime types, using as instruments the incidence of natural disasters and unexpected terms of trade shocks.

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1 Introduction

The "Third Wave" refers to the process of democratization that began with the transition from authoritarian rule in Iberia, culminated in the fall of the Soviet Union, and inspired political reform in late-century Africa (Huntington 1991). As noted by Geddes (2003), what resulted was not the creation of democracies; it was the creation of intermediate or mixed regimes. As shown in Figure 1, in the mid-1970's, these regimes prevailed in less than 4% of the world's states; by the year 2000, they prevailed in more than one quarter.

The behavior of intermediate regimes appears erratic. Focusing on political outcomes, Goldstone, Marshall et al. (2003) and Hegre (2004) and Gates, Hegre et al. (2001) demonstrate that they are less stable politically than are full democracies or autocracies (see also Fearon and Laitin, 2003). Kenyon and Naoi (2010) demonstrate that policy uncertainty is also greater in such regimes. And Epstein et al. (2006) find that while *pace* (Przeworski, Alvarez et al. 2000), a variety of modernization variables, including per capita income, systematically relate to the transition from authoritarian to democratic regimes, none bears a systematic relationship to transitions into or out of the category of intermediate regimes. Epstein et al. (2006) therefore appear to be speaking for the generation of scholars who first addressed this new category of political system when they write: "These are 'fragile' democracies, or perhaps 'unconsolidated democracies.' Whatever one wishes to call them, they emerge .. as [m]ore volatile than either straight autocracies or democracies. Their [behavior] seems at the moment to be largely unpredictable" (p. 24).

Common sense and economic reasoning (North and Weingast 1989; Acemoglu et al. 2003) posit a relationship between political restraint and economic performance. When those who possess capital face the prospect of confiscation, they will refrain from investing; and entrepreneurs will be more willing to innovate when they stand to reap the fruits of their labor. On the basis of such reasoning, scholars expected to find that democracies would achieve higher growth rates than did authoritarian regimes. However, they did not. As documented by Boix and Svolik (2008), Haber (2006), Haber et al. (2006) and Gelbach and Keefer (2008 2009), some authoritarian regimes appear to be able credibly to signal political restraint and to attract capital. As a result, their economic performance approximates that of democracies.[1] As scholars have probed the structure of non-democratic regimes, they have noted the existence of institutional checks, such as legislatures, opposition parties, and elections (Gandhi 2008,

[1] See also the literature on weak institutions, e.g. Acemoglu et al. (2004), Padro i Miguel (2007), and Bueno de Mesquita et al. (2003), and on the political origins of economic instability, i.e. Acemoglu et al. (2003), Rodrik (2000), Cuberes and Jerzmanowski (2009).

Gandhi and Przeworski 2006 and 2007, Cox 2009, Collier and Levitsky 1997, Levitsky and Way 2002, Magaloni 2006 and others, such as Boix and Svolik 2008 Pop-Eliches and Robinson 2009). Given a relationship between political restraint and economic performance, and given the institutional heterogeneity of autocracies, that the economies of some outperform those of the democracies is less surprising. For, as noted by Besley and Kudamatsu (2008), while the mean rate of growth among autocracies may have been lower than that for democracies, "the distribution has fatter tails ...." (p. 453)

This article represents an attempt to model the major characteristics of intermediate regimes so as to account for their economic behavior. While we are unable to test our model directly, we do exploit one of its basic implications: that under well-specified conditions, economic performance is politically informative. In particular, the model implies that at intermediate levels of political restraint, assessments of political risk should vary with the state of the economy. To test this implication, we use panel country data. Measures of country risk, such as "expropriation risk" variable of Knack and Keefer (1998), offer proxies for the risk of predation. To identify the effect of economic downturns, we instrument them with an incidence of natural disasters and unexpected terms-of-trade shocks. To deal with unobserved heterogeneity, we control for country fixed effects.

Informal Argument

The polity is populated by a government and the citizens. The government derives utility from being in office and the benefits of political predation.[2] The citizens derive utility from an outcome, y, which we will interpret as economic growth. At the end of each period, citizens can seek to replace the government. They succeed with some probability, which depends on the nature of political institutions.

Governments differ in their type. Some are competent: they do no harm to their citizens and, upon occasion, deliver positive policy outcomes. Others are incompetent: they are incapable of doing good for their citizens and, upon occasion, do them harm. In addition, some governments are impatient and care only about current payoffs;

[2] By predatory policies we mean the policies that may be profitable for the government but harmful for the the long run welfare of citizens. Expropriation can be blatant, as in the case of Zimbabwe, where the government seized the land of farmers, the assets of firms, and the foreign exchange deposited with banks. It can also result from the manipulation of the interest and exchange rates, the regulation of product or factor markets. The possibility of policy changes in the future increase uncertainty and risks for potential investors. And inflation offers a way in which governments can seize cash balances from private agents, even when not overtly endorsing policies of expropriation.

others possess longer time horizons and care as well for future rents.

The behavior of the rulers thus depends upon their type and the incentives generated by political institutions. A government with a short time horizon always predates. But the behavior of a government with a long time horizon depends on the power of the citizens, i.e. their ability to change their government. If they can easily dismiss the government, both competent and incompetent governments with long time horizons will choose to refrain from predation. If it is difficult for the citizens to do so, both competent and incompetent governments will adopt policies that maximize their per-period rents. The level of political constraints that makes a patient government indifferent between predation and restraint is higher for the competent government. Under intermediate level of constraints, competent governments that possess long time horizons will refrain from predation while incompetent governments may not.

In consolidated democracies, then, governments, regardless of their preferences, are too constrained to behave in a predatory manner. In full autocracies, the absence of constraints leads even governments that value the social welfare to engage in predation. In intermediate regimes, by contrast, governments with different values "separate," thus revealing their type and generating a dispersion in the levels of investment and growth rates among intermediate regimes.

The model thus implies that "intermediate" regimes should be especially unstable. As different types of governments behave differently only in intermediate regimes, there should be a higher variation of risk within them than within full democracies or autocracies. Moreover, in such countries, under imperfect information, the risk of predation should respond more significantly to economic shocks, as people treat them as signals about the nature of their government. As a result, by our model, there should be a higher variation of both cross-sectional variation and time-series volatility in intermediate regimes than in full democracies or autocracies.

2 The Model

The Government

The government might be competent and incompetent. It can also have long or short time horizon. The government can predate and consume rents, but also generate an outcome y for the citizens. Hereafter we assume that such an outcome takes the form of economic growth, but other interpretations are possible.

The government receives utility B from being in office, gets a rent R if engaged in predation, and also cares about future periods if it possesses a long time horizon.

Treating the competence of the government, $\theta \in \{\theta_H, \theta_L\}$, and the incidence of predation, $x \in \{0,1\}$, as binary, we can associate the likelihood of a positive outcome with its type and its decision to engage in predation:

$$\begin{aligned} \Pr(y=1|\theta=\theta_H, x=0) &= 1 \\ \Pr(y=1|\theta=\theta_H, x=1) &= p_H \\ \Pr(y=1|\theta=\theta_L, x=0) &= p_L \\ \Pr(y=1|\theta=\theta_L, x=1) &= 0 \end{aligned} \tag{1}$$

If not engaged in predation, the government's per-period utility is B; if so engaged, its per-period utility is $B+R$. A government with a long time horizon cares about future rents and discounts the future with factor δ. One with a short time horizon cares only about the current period and therefore, has a discount factor of 0. If dismissed from office, a government receives 0 each period thereafter.

We assume that some governments are impatient. Did we not do so, we would have to allow for the possibility that governments that always predated could nonetheless elicit support from their citizens.

The utility of a competent government with a long time horizon is

$$V^t = B + \delta \Pr(staysinoffice|y_t = 1)V^{t+1}$$

if it does not predate and

$$V^t = B + R + \delta \left(p_H \Pr(stays\ in\ office|y_t = 1)V^{t+1} + (1-p_H)\Pr(stays\ in\ office|y_t = 0)V^{t+1} \right)$$

if it engages in predation. The comparable values for an incompetent government with a long time horizon are $V^t = B + \delta \left(p_L \Pr(stays\ in\ office|y_t = 1)V^{t+1} + (1-p_L)\Pr(stays\ in\ office|y = 0)V^{t+1} \right)$ and $V^t = B + R + \delta \Pr(stays\ in\ office|y = 0)V^{t+1}$, respectively. For a government with a short time horizon government, 0 simply replaces the discount factor δ, yielding $V^t = B$ if the government does not predate and $V^t = B + R$ should it do so.

The ex-ante probability of a competent government is μ, and ex-ante probability of a government with a long time horizon is λ which does not depend on μ. The distribution of the types of government is common knowledge. All propositions of the model are valid for $\lambda = 1$.

We also assume that $p_L < 1 - p_H$. This assumption eliminates the possibility of predation being profitable for competent and incompetent governments alike. As economic performance could then not provide a signal of competence, this case lies beyond the scope of the model.

Citizenry

The people receive utility from y. Their per-period utility function is $f(y)$. The discounted long-term utility of citizens is given by $U^t = f(y) + \delta U^{t+1}$ if citizens do not try to overthrow the current government and by $U^t = f(y) + \delta\left(\gamma U^* + (1-\gamma)U^{t+1}\right)$ if they do. Here U^* is the expected utility from a new government drawn from the distribution of new governments, while U^{t+1} is the expected utility from retaining the current government. The discount factor for the citizens is the same as the discount factor for a government with a long time horizon.

Citizens might try to replace the government if they are not satisfied with its performance. If they want to do so, they succeed with probability γ. γ thus captures the level of constraint faced by a government when making decisions: it can be interpreted as the probability that citizens succeed should they seek to overturn the government. If the current and may attempt to overthrow the government. If the current government is overthrown, the next government is competent (i.e. θ_H) with the same ex-ante probability μ.

Note that we assume that λ, the fraction of governments with a long horizon is close to 1. We do so in order to avoid complications arising from the turnover of the leaders being fastest in democracies.

Risk of predation

The risk of predation is the probability that the government is going to predate at any given time period. Formally, r_t denotes the probability of $x = 1$ in period t, given the history of observed events in the past.

Timing

For simplicity, we consider a 3-period model. The structure of the game is common knowledge; in the last period, both the government and the people realize that the game is about to end.

In each period, the timing is:

1. The current government decides whether or not to predate and chooses $x \in \{0, 1\}$.

2. The outcome variable y is realized, with probabilities which depend on the government's decision to predate and the government's competence, as described in (1).

3. Citizens observe the outcome variable y and decide whether to challenge the government; they succeed in overturning it with probability γ.

4. All agents get their per-period payoffs. Risk variables for the next period are calculated.

5. If in stage 3 people succeeded in overthrowing the government, the new government is drawn from the distribution of potential governments.

This sequence of events for one stage of this game is illustrated in Fig. 3 of the Appendix.

2.1 Solution

We are looking for Perfect Bayesian Equilibrium. The game is solved by backward induction. First, we consider what happens at $t = 3$, then we look at $t = 2$ and solve the continuation game between the people and the government given citizens' beliefs. Finally, we assign the continuation payoffs to all nodes in which the continuation game could start and solve the game at $t = 1$.

In period $t = 3$:

All types of government choose to predate. As there is no next period, citizens are indifferent between overthrowing the government or not .

In period $t = 2$:

Citizens know that the government is going to predate in period 3. As they prefer to have a competent government, they replace the current government whenever their posterior probability that the government is competent is less than the prior probability that the next government will be competent, i.e. if $\widehat{\Pr(\theta_H)} < \mu$.

In the beginning of the period, the government can infer the strategy of citizens at the end. A government with a long time horizon wants to extract rents but also to stay in power. At this point, the continuation value of staying in power is $V^3 = B + R$ for both governments that are competent and those that are not. A competent government with a long time horizon compares $B + \delta \Pr(stays\ in\ office|y = 1)\,[B + R]$ with $B + R + \delta\,(p_H \Pr(stays\ in\ office|y = 1)\,[B + R] + (1 - p_H) \Pr(stays\ in\ office|y = 0)\,[B + R])$. An incompetent government with a long time horizon compares

$$B + \delta\,(p_L \Pr(stays\ in\ office|y = 1)[B + R] + (1 - p_L) \Pr(stays\ in\ office|y = 0)\,[B + R])$$

with $B + R + \delta \Pr(stays\ in\ office|y = 0)\,[B + R]$. Note that all governments with a short time horizon compare $B + R$ with B, and so always choose to predate.

If the government has a short time horizon, it compares $B + R$ and B, and always chooses to predate. To find the optimal behavior of a government with a long time horizon, it is necessary to make assumptions about the peoples' strategy conditional on the realization of y, and to check if these assumptions make sense, i.e. they are rational given citizens' beliefs. Note that the citizens have to replace the government in some states of the world (at least if they believe that the probability of a low-competent government is higher than 0), as otherwise governments of all types will choose to misbehave. As replacing the government is costless for the citizens, such a strategy weakly dominates the strategy of doing nothing.

The next two lemmas describes the set of equilibria in a continuation game. Denote x_{ij} the decision of the government of type i to predate in period j, and denote y_j the policy outcome in period j. Denote also the people's strategy in period 2 as $s_2|y_2 \in \{overthrow, \text{ } not \text{ } overthrow\}$.

The first lemma describes the equilibria of a continuation game in which a new government comes in the beginning of the second period. For a new government, citizens' prior beliefs are μ for a competent government and λ for a long-horizon government.

Lemma 1 *At $t = 2$, in a continuation game with a new government, the set of equilibria is the following:*

1. *For $R > \delta(B + R)(1 - p_H)\gamma$, equilibrium strategies are $x_{H2} = 1$, $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow;*

2. *If $\delta(B + R)p_L\gamma < R < \delta(B + R)(1 - p_H)\gamma$, equilibrium strategies are $x_{H2} = 0$, $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow;*

3. *If $\delta(B + R)p_L\gamma > R$, equilibrium strategies are $x_{H2} = 0$, $x_{L2} = 0$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow.*

Proof. In Appendix. ■

Here, the equilibrium strategy of people is simple: if they observe $y_2 = 0$, they overthrow the government; otherwise, they do not. If $y_2 = 1$, the posterior probability that the government is of type H goes up, as compared with μ,the probability that a new government will be of that type. By contrast, when $y_2 = 0$, then that probability declines. The optimal strategy of the government depends on γ. For low γ, all types of government predate; for intermediate values of γ, only the low-competent government predates; while for high values of γ, all types of government refrain from predation.

Now, consider the equilibria in the continuation game if the government survives the first period. These equilibria are described in a lemma below (see Appendix for the full version).

Lemma 2 *At $t = 2$, in a continuation game with the old government, the set of equilibria is the following:*

1. *For $R > \delta(B + R)(1 - p_H)\gamma$, equilibrium strategies are $x_{H2} = 1$, $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow for some values of λ, μ, p_L, and p_H;*

2. *If $\delta(B + R)p_L\gamma < R < \delta(B + R)(1 - p_H)\gamma$, equilibrium strategies are $x_{H2} = 0$, $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow for some values of λ, μ, p_L, and p_H;*

3. *If $\delta(B+R)p_L\gamma > R$, equilibrium strategies are $x_{H2} = 0$, $x_{L2} = 0$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow for some values of λ, μ, p_L, and p_H.*

4. *For any γ, equilibrium strategies are $s_1|1 = s_1|0 =$ not overthrow, $x_{H2} = 1$, and $x_{L2} = 1$ for $y_1 = 1$ and $\frac{\lambda p_L}{p_H(1-p_H)} > 1$.*

Proof. In Appendix. ■

First, the lemma shows that an intuitive equilibrium $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* still exist for some regions of parameter space. In this equilibrium the optimal strategy of the government depends on γ. For low γ, all types of government predate; for intermediate values of γ, only the low-competent government predates; while for high values of γ, all types of government refrain from predation. Second, the lemma shows that $s_2|1 = s_2|0 =$ *not overthrow* can be an optimal strategy if the citizens' posterior beliefs are that the government is competent with 100% probability. If $y_1 = 0$, the equilibria in the continuation game are similar to those described in lemma 1 and citizens choose $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow*. If the citizens observe $y_1 = 1$, however, the situation changes. If $\frac{\lambda p_L}{p_H(1-p_H)} > 1$, there always exist equilibrium in which citizens refrain from overthrowing the government regardless of the value of y_2, as their posterior beliefs about the government's competence are high.

From now on, we assume that $\frac{\lambda p_L}{p_H(1-p_H)} < 1$ and we are in a parameter region in which equilibria 1-3 of lemma 2 exist. We restrict our attention to this region because we want to focus on the situation in which good performance not only provides a signal of the government's competence, but also a forecast of its behavior. In addition, we constrain and the level of risk, leaping it away from 0 or 1, thus allowing it to evolve over time.

Denote people's strategy in period 1 as $s_1|y_1$. The following proposition describes equilibria which emerge in the original game for different values of R and γ (see the summary in Table 1).

Proposition 1 *If R is sufficiently large, the equilibrium set of strategies is the following:*

- $x_{L1} = 1$, $x_{H1} = 1, s_1|1 =$ *not overthrow*, $s_1|0 =$ *overthrow if* γ *is sufficiently small,*

- $x_{L1} = 1$, $x_{H1} = 0, s_1|1 =$ *not overthrow*, $s_1|0 =$ *overthrow if* γ *is sufficiently large;*

If R *is sufficiently small, the equilibrium set of strategies is the following:*

- $x_{L1} = 1$, $x_{H1} = 1, s_1|1 =$ *not overthrow*, $s_1|0 =$ *overthrow if* γ *is sufficiently small ,*

- $x_{L1} = 1$, $x_{H1} = 0, s_1|1 =$ *not overthrow*, $s_1|0 =$ *overthrow if* γ *is in intermediate range,*

- $x_{L1} = 0$, $x_{H1} = 0, s_1|1 =$ *not overthrow*, $s_1|0 =$ *overthrow if* γ *is sufficiently large.*

The corresponding equilibria in a continuation game are described in lemmas 1 and 2.

Proof. In Appendix. ■

Clearly, the size of γ matters. It is important in the first period and for a new government; for an old government after $y_1 = 0$; and for an old government after $y_1 = 1$ for some regions in parameter space.. For high values of γ, or, correspondingly, low values of R, all types of government do not predate, and institutions perform their role of restricting the behavior of the government. For intermediate values of γ and R only the government with high competence refrains from predation, while the government with low competence predates. For small values of γ, or high values of R, all types of government predate, and accountability mechanisms do not work.

2.2 Empirical implications

The model thus generates a relationship between political risk, economic performance and regime type: political restraint and favorable prospects for investment and growth among democracies; political predation and few prospects for investment and growth among unconstrained dictatorships; and political and economic heterogeneity among intermediate regimes.

As we cannot observe the strategies and expectations of the actors, it is difficult to devise direct tests of the model. The logic that underlies it does, however, imply changes in the level of measurable risk that must prevail if it is correct. Consider the risk of predation in the second period, given by $\Pr\left(x_2 = 1|y_1 = i, \widehat{\mu_1}, \widehat{\lambda_1}\right)$, $i \in \{0, 1\}$. Then if the government is not replaced, two propositions follow, both pertaining to the evolution of the perceived risk of predation:

Proposition 2 *After period* 1*, the risk of predation, as perceived by the citizens, goes up after observing* $y_1 = 0$*, i.e. if the government is the same,* $\Pr(x_1 = 1) \leq \Pr(x_2 \widehat{= 1|} y_1 = 0)$.

Proof. In Appendix. ■

Basically, this proposition implies that a growth downturn provides a signal of the government's (in)competence.

More telling, perhaps, is an addition implication (Proposition 3): that the magnitude of this effect should greatest in intermediate regimes.

Proposition 3 *The estimated risk of predation changes more significantly after observing* $y = 0$ *at intermediate values of* γ.

Proof. In Appendix. ■

In intermediate regimes, there are incentives for the different types of governments to separate in equilibrium; as a result, growth downturns provide a clearer signal of a government's type. We therefore expect to find economic performance more closely related to the citizen's estimates of the risk of predation in these regimes than in pure democracies or autocracies.

These predictions do not constitute the full test of the model, of course; but we should observe these patterns of behavior if the model is correct. [3]

[3] This prediction, if confirmed, allows an alternative interpretation. In the model of Johnson et al. (2000), in times of crisis, managers face stronger incentives to expropriate from shareholders, as the marginal product of capital declines. In a similar vein, Paltseva (2008) argues that as the capital accumulation continues, then political predation becomes more attractive, as the marginal product of investment goes down.

Note that the prediction – that governments should be replaced more often after bad economic outcomes – is consistent with the literature on retrospective voting, e.g. Kiewiet and Rivers (1984), and with the assumption of performance voting in accountability models, e.g. Barro (1973), Ferejohn (1991), Persson and Tabellini (2000), Humpreys and Bates (2006). Relevant too is that empirical evidence suggests that citizens may in fact punish politicians for bad luck and reward them for good. Using historical U.S. data, Achen and Bartels (2002) find that voters regularly punish governments for droughts, floods, and shark attacks. Wolfers (2002) finds that voters in oil-producing states tend to re-elect incumbent governors during oil price rises and vote them out of office when the oil price drops.

Lastly, note that if the government is changed, then the risk of predation should not change after the first period. So, if we analyze different governments instead of the same governments over time, our estimates would be subject to attenuation bias.

3 Empirical Results

To test our model, we gathered data for 123 countries for the years 1982-2003; the depth of the panel is dictated by the availability of measures of political risk. Using these data, we identify a set of growth downturns and investigate their impact on measures of risk under different regimes. We show that estimates of risk estimates increase after economic downturns. We also show that the sensitivity of risk to economic performance depends on the nature of political institutions. In particular, we find that after negative economic shocks, the average changes in assessments of risk are greatest in "intermediate" regimes.

3.0.1 Dependent Variable

The data come from the IRIS-3 dataset constructed by Steve Knack and Philip Keefer for the Center for Institutional Reform and the Informal Sector (IRIS) at the University of Maryland. The IRIS Dataset is based on data obtained from ICRG and covers the period 1982-1997. The dataset includes scores for six political risk variables: corruption in government, rule of law, bureaucratic quality, ethnic tensions, repudiation of contracts by government, and risk of expropriation. We employ the IRIS measure of expropriation risk and the risk of the government's repudiation of contracts. Each component is assigned a maximum numerical value, with the highest number of points indicating the lowest level of risk; i.e. the number (0) indicates the highest level. For ease of interpretation, we transform the indices so that *higher* values imply *higher* levels of risk. Each component is assigned a maximum numerical value, with a higher number of points indicating a lower assessment of risk. For ease of interpretation, we transform the indices as well, so that higher values imply greater risk. The variables range from 0 to 10.

We also employ data from the International Country Risk Guide (ICRG) itself. We choose this data source since it yields a deep panel, therefore allowing us to analyze the evolution of risk over time. In the ICRG dataset, the risk measures range from 0 to 100.

Table 4 provides summary statistics for all variables. Iraq in 1991 recorded the highest level of expropriation risk and risk of repudiation of contracts. The highest level of economic risk was recorded in Nicaragua in 1987.

3.1 Independent Variables

As independent variables, we provide measures of γ, or the capacity of citizens to depose their government; a dummy variable to signify economic downturns; and dummies for external economic shocks. In addition, we use several control variables to capture time varying characteristics of different countries.[4]

Measures of Political Restraint:

To measure the ability of citizens to change the government, we focus on the institutional structure of the regime, and, in particular, on the degree to which it is democratic. We use the 21 point Polity scale, as described above, as a proxy for γ. Less skewed than the democracy or autocracy scale, (see figures 4-6), it enables us to group our observations into three groups of roughly equal size: autocracies, with Polity<=-7; democracies, with Polity>=7; and intermediate regimes, with Polity scores in between.[5] Such a division yields three comparable in size groups of points: 1138 observations of autocracies, 911 observations of intermediate regimes, and 1181 observations of democracies.

<Insert Figures 3-5 here>

The results are robust to small changes in the thresholds for Polity.

Economic Shocks:

To identify negative shocks, we employ methodology similar to that used by Hausman et al. (2005). We create a "filter" based on yearly growth differences: $\Delta g_{it} = g_{it} - g_{i,t-1}$, where g_{it} is a growth rate of country i during the time period t. We label a short term change in the growth rate a negative growth shock when

(1) in the year of shock $\Delta g_{it} < -2$ *ppa* (percent points for growth).

(2) after a shock $g_{it} < 2$ *ppa*. This restriction prevents counting as a growth collapse a decline from, say, 8 to 5 percent per year.

We then create the variable $shock_{t,t-2}$ which is equal to 1 if a negative economic shock took place in the years t, $t-1$, or $t-2$, and which is equal to 0 otherwise.

Summary statistics appear in tables 1 and 2 in the Appendix. Countries in Sub-Saharan Africa and the region of Australia and Oceania exhibit the greatest frequency of negative growth shocks, while countries in Western Europe, North America and Asia exhibit the lowest. The average magnitudes are shown in table 2. Countries in

[4] Characteristics of countries which are constant over time are captured by country fixed effects.

[5] The main reason use -7 and 7 thresholds to divide the sample into 3 approximately equal groups is to avoid the bias potentially induced by differences in group size. The within-country variance could go up as the size of the group declines.

Western Europe and North America have the lowest average magnitudes – the average decrease in their growth rates after a shock is 3.4 percentage points. Countries in Australia and Oceania yield the largest, with an average decrease of 8.4 percentage points.

The results are robust to small changes in the parameters of the filter.

Instrumental Variables:

Regressions of risk indicators on growth shocks are subject to endogeneity bias: an increase in political risk can spur a growth decline. Because of the persistence in the risk variables, lags of the shock dummies fail to address this problem. We therefore sought exogenous variables that could provide instruments for negative economic shocks and chose the number of natural disasters and the onset of an unexpected decline in the terms of trade .

Data about natural disasters come from Emergency Events Database (EM-DAT) prepared by World Health Organization Collaborating Centre for Research on the Epidemiology of Disasters (CRED). The relevant descriptive statistics appear in table 3 of the Appendix. The variable "natural disaster" is equal to the number of natural disasters that take place in a given country-year. It ranges from 0 to 12.

Data on unexpected terms of trade shocks are taken from the database composed by Dani Rodrik. He excluded the influence of long-term trends and some macroeconomic fundamentals from current country's terms of trade, to capture "unexpected" part of terms of trade volatility. As do Hausman et al. (2005), we construct a dummy variable which takes the value 1 when there is a negative unexpected terms of trade shock that falls in the lowest quartile (25%) of unexpected shock distribution and 0 otherwise.

Control Variables:

We include several control variables. Given the literature on the relationship between income and democracy (Lipset 1960), we control for the level of GDP per capita using data from WDI. Smaller countries would be more vulnerable to external terms of trade shocks, and vulnerability might decline as population grows. Larger countries might also be more likely to experience natural disasters. We therefore control for the population size, using data from WDI. We also control for trade openness, using the ratio of exports and imports together to country GDP. The data again come from WDI. To control for country's time invariant characteristics, we include country fixed effects.

3.2 Preliminary observations

Our theoretical argument implies that risk is more responsive to economic performance in intermediate regimes. It also implies that the evolution of risk in intermediate regimes differs from that in other types of governments. Taken together, the two implications suggest that intermediate regimes should exhibit higher variance in assessments of risk than would stable democracies or autocracies.

The descriptive statistics suggest that it is the case. Figure 6 captures the variance of expropriation risk by regime type. As can be seen, the middle group corresponding to intermediate regimes, has the largest variance of risk. By implication, then, the variance of growth rates in the sample should be greater for intermediate regimes than for full democracies or full autocracies. Figure 7 lends support to this claim.

3.3 Statistical Tests

Proposition 2 predicts risk should increase after an economic shock. Bayes' rule implies that the contemporary level of risk should depend on its previous value. We therefore estimate a model that includes the lagged value of the dependent variable plus a dummy for economic downturns, control variables, and country fixed effects.

$$risk_{i,t+1} = \beta_0 + \beta_1 risk_{i,t-3} + \beta_2 shock_{i;t,t-2} + \beta_3 X_{i,t-3} + \eta_i + \varepsilon_{i,t+1} \tag{2}$$

Because annual data on political risk are noisy, we use 3-year period averages. $Shock_{t,t-2}$ is an indicator variable that is equal 1 if a negative economic shock occurs in the interval t, $t-1$, or $t-2$. X_{t-3} is the vector of control variables, which are observed prior to economic shock (i.e. at $t-3$).

As an economic decline, $shock_{i;t,t-2}$, may be the consequence of a high risk $risk_{i,t-3}$ at $t-3$, there is the potential for endogeneity bias. In addition, because (2) includes both a lagged dependent variable and fixed effects, the estimates will be inconsistent, given the small T and large N. We therefore estimate (2) using 2SLS procedure, in which $shock_{i;t,t-2}$ is instrumented by $nat\_dst\_3_t$– the number of natural disasters in years t, $t-1$, and $t-2$ – and terms of trade shocks tot_shock_3 by the number of unexpected term of trade shocks in this period. By construction, the instruments are not correlated with either our control variables X_{t-3} or our measure of $risk_{t-3}$. As we use a fixed effect estimator of (2), the possibility of a correlation between our instruments and unobserved, country-specific effects does not arise. To the extent that we believe that natural disasters and terms of trade shocks are exogenous, our instruments are valid.[6] Note too that potential bias in $\widehat{\beta}_2$, which arises because of the

[6] We test the validity of our instruments by using the Hausman's test of overidentifying restrictions. The null hypothesis – that

autoregressive term in (2) and the presence of country effects, is negative; if the bias is present, then, it renders our results even stronger.[7]

Proposition 3 implies that perceptions of risk should depend on the level of γ, the ability of citizens to change their government. In particular, our theory predicts that the increase of risk after an economic shock should be greatest in intermediate regimes.

By using interaction terms, we can combine the tests of the two hypotheses into one model:

$$\begin{aligned} risk_{i,t+1} = {} & \beta_0 + \beta_1 risk_{i,t-3} + \beta_2 shock_{i;t,t-2} * d_{i1,t-3} + \beta_3 shock_{i;t,t-2} * d_{i2,t-3} + \\ & + \beta_4 shock_{i;t,t-2} * d_{i3,t-3} + \beta_5 d_{i1,t-3} + \beta_5 d_{i2,t-3} + \beta_6 X_{i,t-3} + \eta_i + \varepsilon_{i,t+1} \end{aligned} \tag{3}$$

where dummy variables $d_{ij,t-3}$ denote being in group j of political regimes at $t-3$ (group 1 is autocracies, group 2 is intermediate regimes, and group 3 democracies). The coefficients β_2 through β_4 provide a measure of the differential impact of growth collapses among the three categories of regimes. The interactions between $shock_{i;t,t-2}$ and the dummies for political regime are instrumented by the interactions between these dummies and natural disasters $nat\_dst\_3_t$ and terms of trade shocks $tot\_shock\_3_t$. Our model takes $d_{ij,t-3}$ are taken as given, so we do not seek instruments for this term. Proposition 3 implies that the coefficient β_3 for the interaction with intermediate regime is positive and significant, while coefficients β_2 and β_4 should be 0.

3.4 Findings

Table 5 shows the results of an estimation of model (2) that incorporates fixed effects and instrumental variables. The dummy for a negative shock provides a test of the model By Proposition 2, its coefficient should be negative

there are no overidentifying restrictions – implies that instruments are not endogenous to each other. The results suggest that the null hypothesis can not be rejected at 5% significance level.

We also find that F-statistics for the instruments in the first stage is around 6 for political and expropriation risk and that it is therefore unlikely that our instruments are weak.

[7] Note that in this specification, the first difference estimator of (2) is not consistent (Bond 2002). We address the possibility of endogeneity by instrumenting $shock_{i;t,t-2}$, and by noting that the correlation of lagged dependent variable with the error term is negative (see Nickel 1981 for a formal proof). Arellano-Bond (1991) or Blundell-Bond (1998) offer an alternative way of addressing this probelm and we applied them to estimate (2). We do not report the corresponding GMM estimates as the corresponding regressor matrix is nearly singular, implying that small changes in assumed values of the estimators would result in large changes in estimated coefficients, and standard errors cannot be consistently estimated. The signs of the coefficients in GMM estimation and, occasionally, their significance are consistent with those reported in the paper.

and significant. We find that the coefficient is of the expected sign and of a level of significance sufficient to lend support to our model.

Table 6 reports estimates that address the third proposition (3). It confirms that changes in risk in intermediate regimes after an economic shock are of greater magnitude than those in other types of regimes. In addition, the coefficients for intermediate regimes are larger. All coefficients for the interaction between economic shocks and regime type are significant for intermediate regimes, while none are significant for the interactions with autocracy or democracy. Figure 8 illustrates the behavior of the corresponding coefficients for different measures of risk.

Note that between $t-3$ and $t+1$ the government could change. Were that the case, the evidence in Tables 5 and 6 would fail to provide a "clean" test of Propositions 2 and 3; the coefficients would be subject to attenuation bias. We therefore checked whether our results still held when we restricted our attention to countries in which the governments did not change between $t-3$ and $t+1$. When we do so, we find that all results save one still hold .[8]

We also checked that our results still held when we interacted the growth downturn dummy with Polity and Polity squared. The coefficient for Polity squared were then strongest and significant in the intermediate range of the Polity index.

Our results are also robust to the exclusion of former Soviet Union and Eastern European countries.

4 Conclusion

Our model implies that in intermediate regimes chance events can lead to abrupt changes in expectations and thus in the political and economic choices that people make. Both within-country and cross-country variation will therefore be high. Our model thus points to systematic forces that can generate what previously had appeared to be unsystematic and unpredictable behavior in such regimes.

Upon reflection, an additional implication flows from our analysis. The argument suggests the existence of three kinds of countries. First come those in which γ is high. These are typically those in which risks are low and do not change. In such countries, the argument implies, political expectations can have little effect on growth. Investors are protected from government predation by the fact that should a government predate, it would be driven from office. Expectations are therefore already favorable.

Secondly there are countries in which γ is low. Such countries are run by dictators whom the people cannot

[8] Results are available upon request. Some coeffiients in the third column in Table 6 (economic risk) become insignificant.

overthrow. In these countries expectations are bad, and governments do not try to modify them because the expectations will not improve if these governments choose to behave with restraint.

It is among countries in the middle range of γ where growth responds to changes in expectations. According to our model, should a government behave opportunistically, or the country be hit with an external shock, then the perceived level of risk will rise and the rate of growth decline. On the other hand, in this range of γ, there are economic payoffs for the exercise of political restraint. Among such countries, then, the behavior of governments makes a difference. They *can* induce economic growth. They can do so by shaping political expectations.

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APPENDIX

Lemma 3 (Full version of lemma 2) *At $t = 2$, in a continuation game with the old government, the set of equilibria is the following:*

1. *For $R > \delta(B+R)(1-p_H)\gamma$:*

   - *If $y_1 = 0$, equilibrium strategies are $x_{H2} = 1$, $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow;*
   - *If $x_{H1} = 1$, $x_{L1} = 0$, and $y_1 = 1$ then $x_{H2} = 1$, $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow constitute an equilibrium in a continuation game if $\frac{\lambda p_L}{p_H(1-p_H)} > 1$.*

2. *If $\delta(B+R)p_L\gamma < R < \delta(B+R)(1-p_H)\gamma$:*

   - *If $y_1 = 0$, equilibrium strategies are $x_{H2} = 1$, $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow;*
   - *If $y_1 = 1$, $x_{H1} = 1$, and $x_{L1} = 0$ then $x_{H2} = 0$, and $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow constitute an equilibrium in a continuation game if $\lambda * \frac{p_L}{p_H} \frac{\lambda(1-\mu)*p_L+\mu*p_H}{(1-\lambda)\mu*p_H*(1-p_H)} > 1$.*
   - *If $y_1 = 1$, $x_{H1} = 0$, and $x_{L1} = 0$ then $x_{H2} = 0$, and $x_{L2} = 1$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow constitute an equilibrium in a continuation game if $\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)} \frac{\lambda p_L}{(\lambda+(1-\lambda)*p_H)} > 1$.*

3. *If $\delta(B+R)p_L\gamma > R$:*

   - *If $y_1 = 0$ and $x_{H1} = 1$, equilibrium strategies are $x_{H2} = 0$, $x_{L2} = 0$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow;*
   - *If $y_1 = 0$, $x_{H1} = 0$, and $x_{L1} = 1$, strategies $x_{H2} = 0$, $x_{L2} = 0$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow constitute equilibrium in a continuation game only if $\frac{\widehat{\lambda_1}*p_L}{\left(\widehat{\lambda_1}+\left(1-\widehat{\lambda_1}\right)*p_H\right)(1-\lambda)*(1-p_H)} < 1$, here $\widehat{\lambda_1} = \frac{\lambda}{\frac{\mu}{1-\mu}*(1-\lambda)*(1-p_H)+1}$;*
   - *If $y_1 = 0$, $x_{H1} = 0$, and $x_{L1} = 0$, strategies $x_{H2} = 0$, $x_{L2} = 0$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow constitute equilibrium in a continuation game only if $\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)} \frac{\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H} < 1$, here $\widehat{\lambda_1} = \frac{\lambda}{\lambda+\frac{(1-\mu p_H)*(1-\lambda)}{(1-\mu)(1-p_L)}}$;*
   - *If $y_1 = 0$, $x_{H1} = 1$, and $x_{L1} = 0$, strategies $x_{H2} = 0$, $x_{L2} = 0$, and $s_2|1 =$ not overthrow, $s_2|0 =$ overthrow constitute equilibrium in a continuation game only if $\frac{(1-\widehat{\lambda_1}p_L)\lambda p_L}{(1-\widehat{\lambda_1})*(1-p_H)p_H} < 1$, here $\widehat{\lambda_1} = \frac{\lambda}{\lambda+(1-\lambda)\frac{\mu*p_H}{\mu*p_H+(1-\mu)*p_L}}$;*

- *If* $y_1 = 0$, $x_{H1} = 0$, *and* $x_{L1} = 0$, *strategies* $x_{H2} = 0$, $x_{L2} = 0$, *and* $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow constitute equilibrium in a continuation game only if* $\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)} \frac{\lambda p_L}{(\lambda+(1-\lambda)*p_H)} > 1$, *here* $\widehat{\lambda_1} = \frac{\lambda}{\lambda+(1-\lambda)*\frac{\mu*p_H}{\mu+(1-\mu)*p_L}}$;

4. *For any* γ, *if* $x_{H1} = 1$, $x_{L1} = 0$ *or* 1, *and* $y_1 = 1$, *then* $s_1|1 = s_1|0 =$ *not overthrow*, $x_{H2} = 1$, *and* $x_{L2} = 1$ *constitute equilibrium in a continuation game;*

5. *For any* γ, *if* $x_{H1} = 0$, $x_{L1} = 0$, *and* $y_1 = 1$, *then* $x_{H2} = 1$, *and* $x_{L2} = 1$, *and* $s_2|1 = s_2|0 =$ *not overthrow constitute equilibrium in a continuation game.*

6. *For any* γ, *if* $x_{H1} = 0$, $x_{L1} = 0$, *and* $y_1 = 1$, *then* $x_{H2} = 1$, $x_{L2} = 1$, *and* $s_2|1 = s_2|0 =$ *not overthrow constitute equilibrium in a continuation game if* $\frac{\lambda p_L}{p_H(1-p_H)} > 1$.

Proof of Lemma 1. Consider a subgame at $t = 2$ if a new government comes to power. For any government from the pool of possible governments, the prior probability that a government has high competence is μ, while the prior probability that a government has a long time horizon is λ. As we are looking for the equilibrium in pure strategies, the government's strategy $Pr(x|\theta, t = 2)$ can be written as $x_{\theta 2} \in \{0, 1\}$, where θ is the type of the government. This notation refers only to the government with a long time horizon, as all governments with a short time horizon predate in all states of the world.

The outcome $y = 1$ is possible if: (1) competence $\theta = \theta_H$, discount $\delta = \delta$, and predation $x = 1$, (2) competence $\theta = \theta_H$, discount $\delta = \delta$, and predation $x = 0$, (3) competence $\theta = \theta_H$, discount $\delta = 0$, and predation $x = 1$, (4) competence $\theta = \theta_L$, discount $\delta = \delta$, and predation $x = 0$. The outcome $y = 0$ is possible in the following cases: (1) competence $\theta = \theta_H$, discount $\delta = \delta$, and predation $x = 1$, (2) competence $\theta = \theta_H$, discount $\delta = 0$, and predation $x = 1$, (3) competence $\theta = \theta_L$, discount $\delta = \delta$, and predation $x = 0$, (4) competence $\theta = \theta_L$, discount $\delta = \delta$, and predation $x = 1$, and (5) competence $\theta = \theta_L$, discount $\delta = 0$, and predation $x = 1$. Probabilities of these outcomes depend on people's prior beliefs about the types of a government and on the government's strategy. People's posterior beliefs about the government's competence are computed by Bayesian formula:

$$\widehat{\mu_2}|_{y=1} = \frac{\mu*\lambda*x_{H2}*p_H+\mu*\lambda*(1-x_{H2})+\mu*(1-\lambda)*p_H}{\mu*\lambda*x_{H2}*p_H+\mu*\lambda*(1-x_{H2})+\mu*(1-\lambda)*p_H+(1-\mu)*\lambda*(1-x_{L2})*p_L}$$

$$\widehat{\mu_2}|_{y=0} = \frac{\mu*\lambda*x_{H2}*(1-p_H)+\mu*(1-\lambda)*(1-p_H)}{\mu*\lambda*x_{H2}*(1-p_H)+\mu*(1-\lambda)*(1-p_H)+(1-\mu)*\lambda*(1-x_{L2})*(1-p_L)+(1-\mu)*\lambda*x_{L2}+(1-\mu)*(1-\lambda)}$$

Now consider four possible pure strategy profiles of a government at $t = 2$: $x_{H2} = 1, x_{L2} = 1$; $x_{H2} = 1, x_{L2} = 0$; $x_{H2} = 0, x_{L2} = 1$; $x_{H2} = 0, x_{L2} = 0$. The rest of the proof is organized as follows. First, for each strategy of a government, we find people's best response to this strategy. Second, we check if the original strategy profile of a government is still a best response to people's strategy, i.e. if a proposed pair of strategies constitute an equilibrium in this game.

Note that everywhere it is optimal for people to change the government if their posterior that the government has high competence is lower than μ. Similar, it is optimal to keep the government if people's posterior that the government has high competence is higher than μ.

(1) Assume that $x_{H2} = 1, x_{L2} = 1$. People's posteriors about the government's competence are $\widehat{\mu_2}|_{y=1} = \frac{\mu * p_H}{\mu * p_H} = 1 > \mu$, $\widehat{\mu_2}|_{y=0} = \frac{\mu*(1-p_H)}{\mu*(1-p_H)+(1-\mu)} = \frac{\mu*(1-p_H)}{-\mu p_H+1} < \mu$. Therefore, the optimal response of people to the assumed government's strategy is $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$.

The payoffs of different types of the government given the people's strategy are following. For $\theta = \theta_H$, the payoff from predation is $U(\theta_H|x = 1) = B+R+\delta\left(p_H(B + R) + (1 - p_H)(1 - \gamma)(B + R)\right)$, and the payoff from restraint is $U(\theta_H|x = 0) = B+\delta(B+R)$. So, for a high-competent government, predation is profitable if $R > \delta\gamma(1-p_H)(B+R)$. Similarly, for $\theta = \theta_L$, the payoff from predation is $U(\theta_L|x = 1) = B + R + \delta(1 - \gamma)(B + R)$, and the payoff from restraint is $U(\theta_L|x = 0) = B + \delta(p_L(B + R) + (1 - p_L)(1 - \gamma)(B + R))$. Therefore, a low-competent government predates if $R > \delta\gamma p_L(B + R)$. As $1 - p_H > p_L$, strategy profiles $x_{H2} = 1, x_{L2} = 1$, and $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ constitute equilibrium if $R > \delta\gamma(1 - p_H)(B + R)$.

(2) Assume that $x_{H2} = 1, x_{L2} = 0$. People's posteriors about the government's competence are $\widehat{\mu_2}|_{y=1} = \frac{\mu*p_H}{\mu*p_H+(1-\mu)*\lambda*p_L} = \frac{\mu}{\mu+(1-\mu)*\lambda*\frac{p_L}{p_H}} > \mu$, $\widehat{\mu_2}|_{y=0} = \frac{\mu*(1-p_H)}{\mu*(1-p_H)+(1-\mu)*\lambda*(1-p_L)+(1-\lambda)(1-\mu)} = \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{1-p_H}} < \mu$. Therefore, the optimal response of people to the assumed government's strategy is $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$.

For a high-competent government, predation is profitable if $R > \delta\gamma(1-p_H)(B+R)$. Similarly, a low-competent government predates if $R > \delta\gamma p_L(B + R)$. As $1 - p_H > p_L$, strategy $x_{L2} = 0$ is not optimal for a low-type government, and for any parameter values $x_{H2} = 1, x_{L2} = 0$ is not the part of an equilibrium.

(3) Assume that $x_{H2} = 0, x_{L2} = 1$. People's posteriors about the government's competence are $\widehat{\mu_2}|_{y=1} = \frac{\mu*\lambda+\mu*(1-\lambda)*p_H}{\mu*\lambda+\mu*(1-\lambda)*p_H} = 1 > \mu$, $\widehat{\mu_2}|_{y=0} = \frac{\mu*(1-\lambda)*(1-p_H)}{\mu*(1-\lambda)*(1-p_H)+1-\mu} = \frac{\mu}{\mu+(1-\mu)*\frac{1}{(1-\lambda)*(1-p_H)}} < \mu$. Therefore, the optimal response of people to the assumed government's strategy is $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$.

As before, for a high-competent government, predation is profitable if $R > \gamma\delta(1 - p_H)(B + R)$. Similarly, for

$\theta = \theta_L$, predation is optimal if $R > \delta\gamma p_L(B+R)$. As $1 - p_H > p_L$, strategy profiles $x_{H2} = 0, x_{L2} = 1$, and $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ constitute equilibrium if $\gamma\delta p_L(B+R) < R < \gamma\delta(1-p_H)(B+R)$.

(4) Assume that $x_{H2} = 0, x_{L2} = 0$. People's posteriors about the government's competence are $\widehat{\mu_2}|_{y=1} = \frac{\mu*\lambda+\mu*(1-\lambda)*p_H}{\mu*\lambda+\mu*(1-\lambda)*p_H+(1-\mu)*\lambda*p_L} = \frac{\mu}{\mu+\frac{(1-\mu)*\lambda*p_L}{\lambda+(1-\lambda)*p_H}} > \mu$ (as $\lambda * p_L < \lambda$, and, therefore, $\lambda * p_L < \lambda + (1-\lambda) * p_H$), $\widehat{\mu_2}|_{y=0} = \frac{\mu*(1-\lambda)*(1-p_H)}{\mu*(1-\lambda)*(1-p_H)+(1-\mu)(1-\lambda p_L)} = \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}} < \mu$ (as $1 > 1-p_H$, and $1-\lambda p_L > 1-\lambda$). Therefore, the optimal response of people to the assumed government's strategy is $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$.

As before, for a high-competent government, predation is profitable if $R > \delta\gamma(1-p_H)(B+R)$, and for a low-competent government, the predation is profitable if $R > \delta\gamma p_L(B+R)$. As a result, the strategy profiles $x_{H2} = 0, x_{L2} = 0$, and $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ constitute equilibrium if $\gamma\delta p_L(B+R) > R$. ■

Proof of Lemma 2. After the first period, the people's posterior beliefs that the government has high competence depend on the government strategy in the first period. Similar to the case of a new government in the second period, these beliefs can be computed by Bayesian updating:

$$\widehat{\mu_1}|_{y_1=1} = \frac{\mu*\lambda*x_{H1}*p_H+\mu*\lambda*(1-x_{H1})+\mu*(1-\lambda)*p_H}{\mu*\lambda*x_{H1}*p_H+\mu*\lambda*(1-x_{H1})+\mu*(1-\lambda)*p_H+(1-\mu)*\lambda*(1-x_{L1})*p_L}$$

$$\widehat{\mu_1}|_{y_1=0} = \frac{\mu*\lambda*x_{H1}*(1-p_H)+\mu*(1-\lambda)*(1-p_H)}{\mu*\lambda*x_{H1}*(1-p_H)+\mu*(1-\lambda)*(1-p_H)+(1-\mu)*\lambda*(1-x_{L1})*(1-p_L)+(1-\mu)*\lambda*x_{L1}+(1-\mu)*(1-\lambda)}$$

For $x_{H1} = 1$, $x_{L1} = 1$, these beliefs are $\widehat{\mu_1}|_{y_1=1} = 1$ and $\widehat{\mu_1}|_{y_1=0} = \frac{\mu*(1-p_H)}{\mu*(1-p_H)+(1-\mu)} < \mu$.

For $x_{H1} = 1$, $x_{L1} = 0$, these beliefs are $\widehat{\mu_1}|_{y_1=1} = \frac{\mu*p_H}{\mu*p_H+(1-\mu)*\lambda*p_L} = \frac{\mu}{\mu+(1-\mu)*\lambda*\frac{p_L}{p_H}} > \mu$ and $\widehat{\mu_1}|_{y_1=0} = \frac{\mu*(1-p_H)}{\mu*(1-p_H)+(1-\mu)*\lambda*(1-p_L)+(1-\lambda)(1-\mu)} = \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{1-p_H}} < \mu$.

For $x_{H1} = 0$, $x_{L1} = 1$, these beliefs are $\widehat{\mu_1}|_{y_1=1} = 1 > \mu$ and $\widehat{\mu_1}|_{y_1=0} = \frac{\mu*(1-\lambda)*(1-p_H)}{\mu*(1-\lambda)*(1-p_H)+1-\mu} = \frac{\mu}{\mu+(1-\mu)*\frac{1}{(1-\lambda)*(1-p_H)}} < \mu$.

For $x_{H1} = 0$, $x_{L1} = 0$, these beliefs are $\widehat{\mu_1}|_{y_1=1} = \frac{\mu*\lambda+\mu*(1-\lambda)*p_H}{\mu*\lambda+\mu*(1-\lambda)*p_H+(1-\mu)*\lambda*p_L} = \frac{\mu}{\mu+\frac{(1-\mu)*\lambda*p_L}{\lambda+(1-\lambda)*p_H}} > \mu$ (as $\lambda * p_L < \lambda + (1-\lambda) * p_H$), and $\widehat{\mu_1}|_{y_1=0} = \frac{\mu*(1-\lambda)*(1-p_H)}{\mu*(1-\lambda)*(1-p_H)+(1-\mu)(1-\lambda p_L)} = \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}} < \mu$ (as $1 > 1-p_H$, and $1-\lambda p_L > 1-\lambda$).

Now, we look separately at the cases of $y = 0$ and $y = 1$ and analyze which equilibria might be supported for different strategies of the government in the first period.

1. Assume that $y = 0$, $x_{H1} = 1$, and $x_{L1} = 1$. Here $\widehat{\mu_1}|_{y_1=0} = \frac{\mu*(1-p_H)}{1-\mu p_H} < \mu$, $\widehat{\lambda_1}|_{y_1=0} = \lambda$.

- If $x_{H2} = 1$, and $x_{L2} = 1$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}*(1-p_H)}{-\widehat{\mu_1}p_H+1} < \widehat{\mu_1} < \mu$. Then the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow*. Therefore, as calculations in the proof of Lemma 1 show, strategies $x_{H2} = 1$, and $x_{L2} = 1$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $R > \gamma\delta(1-p_H)(B+R)$.

- If $x_{H2} = 1$, and $x_{L2} = 0$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\widehat{\lambda_1}*\frac{p_L}{p_H}} = \frac{\mu}{\mu+(1-\mu)*\lambda*\frac{p_L}{p_H(1-p_H)}} < \mu$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{1-p_H}} < \widehat{\mu_1}|_{y_1=0} < \mu$. Note that $\widehat{\mu_2}|_{y_2=1}$ is smaller than μ if $\frac{\lambda p_L}{p_H(1-p_H)} > 1$, and higher than μ if $\frac{\lambda p_L}{p_H(1-p_H)} > 1 < 1$. Then the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* if $\frac{\lambda p_L}{p_H(1-p_H)} < 1$ and $s_1|1 = s_1|0 =$ *overthrow* if $\frac{\lambda p_L}{p_H(1-p_H)} > 1$. In both cases, strategy $x_{L2} = 0$ is not optimal for a low-type government, and for any parameter values $x_{H2} = 1, x_{L2} = 0$ is not the part of an equilibrium.

- If $x_{H2} = 0$, and $x_{L2} = 1$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$. Then the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow*. Therefore, as calculations in the proof of Lemma 1 show, strategies $x_{H2} = 0$, and $x_{L2} = 1$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R) < R < \gamma\delta(1-p_H)(B+R)$.

- If $x_{H2} = 0$, and $x_{L2} = 0$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+\frac{(1-\widehat{\mu_1})*\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}} = \frac{\mu}{\mu+\frac{(1-\mu)*\widehat{\lambda_1}*p_L}{(\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H)(1-p_H)}} > \mu$ (as $p_L < 1-p_H$ and $\widehat{\lambda_1} < \widehat{\lambda_1} + (1-\widehat{\lambda_1})*p_H$) and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$. Then the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow*.Therefore, strategies $x_{H2} = 0$, and $x_{L2} = 0$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R) > R$.

2. Assume that $y = 0$, $x_{H1} = 1$, and $x_{L1} = 0$. Here $\widehat{\mu_1}|_{y_1=0} = \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{1-p_H}} < \mu$, and $\widehat{\lambda_1}|_{y_1=0} = \frac{\lambda}{\lambda+(1-\lambda)\frac{1-\mu p_H}{\mu*(1-p_H)+(1-\mu)*(1-p_L)}} < \lambda$.

   - If $x_{H2} = 1$, and $x_{L2} = 1$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}*(1-p_H)}{-\widehat{\mu_1}p_H+1} < \widehat{\mu_1} < \mu$. The optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow*. Therefore, strategies $x_{H2} = 1$, and $x_{L2} = 1$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $R > \gamma\delta(1-p_H)(B+R)$.

- If $x_{H2} = 1$, and $x_{L2} = 0$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\widehat{\lambda_1}*\frac{p_L}{p_H}} = \frac{\mu}{\mu+(1-\mu)*\widehat{\lambda_1}*\frac{p_L(1-\lambda p_L)}{p_H(1-p_H)}}$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{1-p_H}} < \widehat{\mu_1}|_{y_1=0} < \mu$. Note that $\widehat{\mu_2}|_{y_2=1}$ is higher than μ if $\widehat{\lambda_1} * \frac{p_L(1-\lambda p_L)}{p_H(1-p_H)} > 1$, and lower than μ if $\widehat{\lambda_1} * \frac{p_L(1-\lambda p_L)}{p_H(1-p_H)} < 1$. Then the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* if $\widehat{\lambda_1} * \frac{p_L(1-\lambda p_L)}{p_H(1-p_H)} > 1$ and $s_1|1 = s_1|0 =$ *overthrow* if $\widehat{\lambda_1} * \frac{p_L(1-\lambda p_L)}{p_H(1-p_H)} < 1$. In both cases, strategy $x_{L2} = 0$ is not optimal for a low-type government, and for any parameter values $x_{H2} = 1, x_{L2} = 0$ is not the part of an equilibrium.

- If $x_{H2} = 0$, and $x_{L2} = 1$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$. Then optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow*. Therefore, strategies $x_{H2} = 0$, and $x_{L2} = 1$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B + R) < R < \gamma\delta(1 - p_H)(B + R)$.

- If $x_{H2} = 0$, and $x_{L2} = 0$, the posterior beliefs of people about the government's competence are $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+\frac{(1-\widehat{\mu_1})*\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}} = \frac{\mu}{\mu+\frac{(1-\mu)*\widehat{\lambda_1}*p_L(1-\lambda p_L)}{(\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H)(1-p_H)}} > \mu$ (as $p_L(1-\lambda p_L) < 1-p_H$ and $\widehat{\lambda_1} < \widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H$) and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$ (as $1 - \widehat{\lambda_1}p_L > 1 - \widehat{\lambda_1}$). The optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* Therefore, strategies $x_{H2} = 0$, and $x_{L2} = 0$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B + R) > R$.

3. Assume that $y = 0$, $x_{H1} = 0$, and $x_{L1} = 1$. Here $\widehat{\mu_1}|_{y_1=0} = \frac{\mu}{\mu+(1-\mu)*\frac{1}{(1-\lambda)*(1-p_H)}} < \mu$, $\widehat{\lambda_1}|_{y_1=0} = \frac{\lambda}{\frac{\mu}{1-\mu}*(1-\lambda)*(1-p_H)+1} < \lambda$.

   - If $x_{H2} = 1$ and $x_{L2} = 1$ then $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}*(1-p_H)}{-\widehat{\mu_1}p_H+1} < \mu$. Then strategies $x_{H2} = 1$, and $x_{L2} = 1$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $R > \gamma\delta(1 - p_H)(B + R)$.

   - If $x_{H2} = 1$ and $x_{L2} = 0$, then $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\widehat{\lambda_1}*\frac{p_L}{p_H}} = \frac{\mu}{\mu+\frac{(1-\mu)}{(1-p_H)(1-\lambda)}*\widehat{\lambda_1}*\frac{p_L}{p_H}}$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{1-p_H}} < \widehat{\mu_1}|_{y_1=0} < \mu$. If $\widehat{\mu_2}|_{y_2=1} > \mu$, the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* and if $\widehat{\mu_2}|_{y_2=1} < \mu$, the strategy of people is $s_1|1 = s_1|0 =$ *overthrow*. In both cases, $x_{H2} = 1, x_{L2} = 0$ is not the part of an equilibrium.

   - If $x_{H2} = 0$ and $x_{L2} = 1$, then $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$. Then strategies $x_{H2} = 0$, and $x_{L2} = 1$, and $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R) < R < \gamma\delta(1-p_H)(B+R)$.

- If $x_{H2} = 0$ and $x_{L2} = 0$, then $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+\frac{(1-\widehat{\mu_1})*\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}} = \frac{\mu}{\mu+\frac{(1-\mu)*\widehat{\lambda_1}*p_L}{(\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H)(1-\lambda)*(1-p_H)}}$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$ (as $1-\widehat{\lambda_1 p_L} > 1-\widehat{\lambda_1}$). Note that $\widehat{\mu_2}|_{y_2=1}$ is higher than μ if $\frac{\widehat{\lambda_1}*p_L}{\left(\widehat{\lambda_1}+\left(1-\widehat{\lambda_1}\right)*p_H\right)(1-\lambda)*(1-p_H)} < 1$, and lower than μ if $\frac{\widehat{\lambda_1}*p_L}{\left(\widehat{\lambda_1}+\left(1-\widehat{\lambda_1}\right)*p_H\right)(1-\lambda)*(1-p_H)} > 1$. Then the optimal strategy of people is $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ if

$$\frac{\widehat{\lambda_1}*p_L}{\left(\widehat{\lambda_1}+\left(1-\widehat{\lambda_1}\right)*p_H\right)(1-\lambda)*(1-p_H)} < 1$$

and $s_1|1 = s_1|0 = \textit{overthrow}$ if $\frac{\widehat{\lambda_1}*p_L}{\left(\widehat{\lambda_1}+\left(1-\widehat{\lambda_1}\right)*p_H\right)(1-\lambda)*(1-p_H)} > 1$. Note that $x_{H2} = 0$, and $x_{L2} = 0$ are not best responses to $s_1|1 = s_1|0 = \textit{overthrow}$. As a result, strategies $x_{H2} = 0$, and $x_{L2} = 0$, and $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ constitute an equilibrium in a continuation game only if $\gamma\delta p_L(B+R) > R$ and $\frac{\widehat{\lambda_1}*p_L}{\left(\widehat{\lambda_1}+\left(1-\widehat{\lambda_1}\right)*p_H\right)(1-\lambda)*(1-p_H)} < 1$.

4. Assume that $y = 0$, $x_{H1} = 0$, and $x_{L1} = 0$. Here $\widehat{\mu_1}|_{y_1=0} = \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}} < \mu$, $\widehat{\lambda_1}|_{y_1=0} = \frac{\lambda}{\lambda+\dfrac{(1-\mu p_H)*(1-\lambda)}{(1-\mu)(1-p_L)}} < \lambda$.

   - If $x_{H2} = 1$ and $x_{L2} = 1$ then $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}*(1-p_H)}{-\widehat{\mu_1}p_H+1} < \mu$. Then strategies $x_{H2} = 1$, and $x_{L2} = 1$, and $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ constitute an equilibrium in a continuation game if $R > \gamma\delta(1-p_H)(B+R)$.

   - If $x_{H2} = 1$ and $x_{L2} = 0$, then $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\widehat{\lambda_1}*\frac{p_L}{p_H}} = \frac{\mu}{\mu+\frac{(1-\mu)}{(1-p_H)}\frac{1-\lambda p_L}{(1-\lambda)}*\widehat{\lambda_1}*\frac{p_L}{p_H}}$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{1-p_H}} < \widehat{\mu_1}|_{y_1=0} < \mu$. If $\widehat{\mu_2}|_{y_2=1} > \mu$, the optimal strategy of people is $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ and if $\widehat{\mu_2}|_{y_2=1} < \mu$, the strategy of people is $s_1|1 = s_1|0 = \textit{overthrow}$. In both cases, $x_{H2} = 1, x_{L2} = 0$ is not the part of an equilibrium.

   - If $x_{H2} = 0$ and $x_{L2} = 1$, then $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$. Then strategies $x_{H2} = 0$, and $x_{L2} = 1$, and $s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R) < R < \gamma\delta(1-p_H)(B+R)$.

   - If $x_{H2} = 0$ and $x_{L2} = 0$, then $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+\frac{(1-\widehat{\mu_1})*\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}} = \frac{\mu}{\mu+\frac{(1-\mu)*\widehat{\lambda_1}*p_L(1-\lambda p_L)}{(\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H)(1-\lambda)*(1-p_H)}}$ and $\widehat{\mu_2}|_{y_2=0} =$

$\frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{(1-\widehat{\lambda_1})*(1-p_H)}} < \widehat{\mu_1}|_{y_1=0} < \mu$ (as $1-\widehat{\lambda_1}p_L > 1-\widehat{\lambda_1}$). Note that $\widehat{\mu_2}|_{y_2=1}$ is higher than μ if

$$\frac{\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)} < 1$$

and lower than μ if $\frac{\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)} > 1$. Then the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* if $\frac{\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)} < 1$ and $s_1|1 = s_1|0 =$ *overthrow* if $\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}\frac{\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H} > 1$. Note that $x_{H2} = 0$, and $x_{L2} = 0$ are not best responses to $s_1|1 = s_1|0 =$ *overthrow*. As a result, strategies $x_{H2} = 0$, and $x_{L2} = 0$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game only if $\gamma\delta p_L(B+R) > R$ and $\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}\frac{\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H} < 1$.

5. Assume that $y = 1$, $x_{H1} = 1$, and $x_{L1} = 1$. Here $\widehat{\mu_1}|_{y_1=1} = 1 > \mu$, $\widehat{\lambda_1}|_{y_1=1} = \lambda$. For any strategy of the government in the second period, posterior beliefs about the government's competence are $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = 1$. Therefore, the optimal strategy for people is $s_1|1 = s_1|0 =$ *not overthrow*, and $x_{H2} = 1$, and $x_{L2} = 1$ is the government's optimal response to that. So, the strategies $s_1|1 = s_1|0 =$ *not overthrow*, $x_{H2} = 1$, and $x_{L2} = 1$ constitute equilibrium in a continuation game.

6. Assume that $y = 1$, $x_{H1} = 1$, and $x_{L1} = 0$. Here $\widehat{\mu_1}|_{y_1=1} = \frac{\mu}{\mu+(1-\mu)*\lambda*\frac{p_L}{p_H}} > \mu$, $\widehat{\lambda_1}|_{y_1=0} = \frac{\lambda}{\lambda+(1-\lambda)\frac{\mu*p_H}{\mu*p_H+(1-\mu)*p_L}} > \lambda$.

   - If $x_{H2} = 1$, and $x_{L2} = 1$, then $\widehat{\mu_2}|_{y_2=1} = 1$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}*(1-p_H)}{1-\widehat{\mu_1}p_H} = \frac{\mu}{\mu+(1-\mu)*\lambda*\frac{p_L}{p_H(1-p_H)}}$. Note that $\widehat{\mu_2}|_{y_2=0}$ is higher than μ if $\frac{\lambda p_L}{p_H(1-p_H)} < 1$, and lower than μ if $\frac{\lambda p_L}{p_H(1-p_H)} > 1$. Then the optimal strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* if $\frac{\lambda p_L}{p_H(1-p_H)} < 1$ and $s_1|1 = s_1|0 =$ *not overthrow* if $\frac{\lambda p_L}{p_H(1-p_H)} > 1$. Therefore, strategies $x_{H2} = 1$, $x_{L2} = 1$, and $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow* constitute an equilibrium in a continuation game if $R > \gamma\delta(1-p_H)(B+R)$ and $\frac{\lambda p_L}{p_H(1-p_H)} > 1$, while strategies $x_{H2} = 1$, $x_{L2} = 1$, and $s_1|1 = s_1|0 =$ *not overthrow* constitute equilibrium if $\frac{\lambda p_L}{p_H(1-p_H)} < 1$.
   - If $x_{H2} = 1$, and $x_{L2} = 0$, then $\widehat{\mu_2}|_{y_2=1} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\widehat{\lambda_1}*\frac{p_L}{p_H}} > \widehat{\mu_1} > \mu$ and $\widehat{\mu_2}|_{y_2=0} = \frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{1-p_H}} = \frac{\mu}{\mu+(1-\mu)*\lambda*\frac{p_L}{p_H}*\frac{1-\widehat{\lambda_1}p_L}{1-p_H}}$. If $\widehat{\mu_2}|_{y_2=0} > \mu$, the optimal strategy of people is $s_2|1 = s_2|0 =$ *not overthrow* and if $\widehat{\mu_2}|_{y_2=0} < \mu$, the strategy of people is $s_2|1 =$ *not overthrow*, $s_2|0 =$ *overthrow*. In both cases, $x_{H2} = 1, x_{L2} = 0$ is not the part of an equilibrium.

- If $x_{H2}=0$, and $x_{L2}=1$, then $\widehat{\mu_2}|_{y_2=1}=1$ and

$$\widehat{\mu_2}|_{y_2=0}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}}=\frac{\mu}{\mu+(1-\mu)*\lambda*\frac{p_L}{p_H}\frac{\lambda(1-\mu)*p_L+\mu*p_H}{(1-\lambda)\mu*p_H*(1-p_H)}}$$

  If $\widehat{\mu_2}|_{y_2=0}>\mu$, the optimal strategy of people is $s_2|1=s_2|0=$ *not overthrow* and if $\widehat{\mu_2}|_{y_2=0}<\mu$, the strategy of people is $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow*. If $s_2|1=s_2|0=$ *not overthrow*, the strategy $x_{H2}=0$ and $x_{L2}=1$ is not a best response. Therefore, strategies $x_{H2}=0$, and $x_{L2}=1$, and $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R)<R<\gamma\delta(1-p_H)(B+R)$ and $\lambda*\frac{p_L}{p_H}\frac{\lambda(1-\mu)*p_L+\mu*p_H}{(1-\lambda)\mu*p_H*(1-p_H)}>1$.

- If $x_{H2}=0$, and $x_{L2}=0$, then $\widehat{\mu_2}|_{y_2=1}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+\frac{(1-\widehat{\mu_1})*\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}}>\widehat{\mu_1}>\mu$ and

$$\widehat{\mu_2}|_{y_2=0}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{(1-\widehat{\lambda_1})*(1-p_H)}}=\frac{\mu}{\mu+(1-\mu)*\frac{(1-\widehat{\lambda_1}p_L)\lambda p_L}{(1-\widehat{\lambda_1})*(1-p_H)p_H}}$$

  Note that $\widehat{\mu_2}|_{y_2=0}$ is higher than μ if $\frac{(1-\widehat{\lambda_1}p_L)\lambda p_L}{(1-\widehat{\lambda_1})*(1-p_H)p_H}<1$, and lower than μ if $\frac{(1-\widehat{\lambda_1}p_L)\lambda p_L}{(1-\widehat{\lambda_1})*(1-p_H)p_H}$.Then the optimal strategy of people is $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* if $\frac{(1-\widehat{\lambda_1}p_L)\lambda p_L}{(1-\widehat{\lambda_1})*(1-p_H)p_H}<1$ and $s_1|1=s_1|0=$ *not overthrow* if $\frac{(1-\widehat{\lambda_1}p_L)\lambda p_L}{(1-\widehat{\lambda_1})*(1-p_H)p_H}>1$. Therefore, strategies $x_{H2}=0$, and $x_{L2}=0$, and $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R)>R$ and $\frac{(1-\widehat{\lambda_1}p_L)\lambda p_L}{(1-\widehat{\lambda_1})*(1-p_H)p_H}<1$.

7. Assume that $y=1$, $x_{H1}=0$, and $x_{L1}=1$. Here $\widehat{\mu_1}|_{y_1=1}=1>\mu$, $\widehat{\lambda_1}|_{y_1=1}=\frac{\lambda}{\lambda+(1-\lambda)*p_H}<\lambda$. For any strategy of the government in the second period, posterior beliefs about the government's competence are $\widehat{\mu_2}|_{y_2=1}=1$ and $\widehat{\mu_2}|_{y_2=0}=1$. Therefore, the optimal strategy for people is $s_1|1=s_1|0=$ *not overthrow*, and $x_{H2}=1$, and $x_{L2}=1$ is the government's optimal response to that. So, the strategies $s_1|1=s_1|0=$ *not overthrow*, $x_{H2}=1$, and $x_{L2}=1$ constitute equilibrium in a continuation game.

8. Assume that $y=1$, $x_{H1}=0$, and $x_{L1}=0$. Here $\widehat{\mu_1}|_{y_1=1}=\frac{\mu}{\mu+\frac{(1-\mu)*\lambda*p_L}{\lambda+(1-\lambda)*p_H}}>\mu$, $\widehat{\lambda_1}|_{y_1=1}=\frac{\lambda}{\lambda+(1-\lambda)*\frac{\mu*p_H}{\mu+(1-\mu)*p_L}}>\lambda$.

   - If $x_{H2}=1$ and $x_{L2}=1$ then $\widehat{\mu_2}|_{y_2=1}=1$ and $\widehat{\mu_2}|_{y_2=0}=\frac{\widehat{\mu_1}*(1-p_H)}{-\widehat{\mu_1}p_H+1}=\frac{\mu}{\mu+\frac{(1-\mu)*\lambda*p_L}{(\lambda+(1-\lambda)*p_H)(1-p_H)}}>\mu$. Then strategies $x_{H2}=1$, and $x_{L2}=1$, and $s_2|1=s_2|0=$ *not overthrow* constitute an equilibrium in a continuation game.

- If $x_{H2}=1$ and $x_{L2}=0$, then $\widehat{\mu_2}|_{y_2=1}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\widehat{\lambda_1}*\frac{p_L}{p_H}}>\widehat{\mu_1}>\mu$ and $\widehat{\mu_2}|_{y_2=0}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{1-p_H}}$. If $\widehat{\mu_2}|_{y_2=1}>\mu$, the optimal strategy of people is $s_2|1=s_2|0=$ *not overthrow* and if $\widehat{\mu_2}|_{y_2=1}<\mu$, the strategy of people is $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow*. In both cases, $x_{H2}=1, x_{L2}=0$ is not the part of an equilibrium.

- If $x_{H2}=0$ and $x_{L2}=1$, then $\widehat{\mu_2}|_{y_2=1}=1$ and

$$\widehat{\mu_2}|_{y_2=0}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}}=\frac{\mu}{\mu+(1-\mu)*\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}\frac{\lambda p_L}{(\lambda+(1-\lambda)*p_H)}}$$

  If $\widehat{\mu_2}|_{y_2=0}<\mu$, the optimal strategy of people is $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* and if $\widehat{\mu_2}|_{y_2=1}>\mu$, the strategy of people is $s_1|1=s_1|0=$ *not overthrow*. Then strategies $x_{H2}=0$, and $x_{L2}=1$, and $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R)<R<\gamma\delta(1-p_H)(B+R)$ and $\frac{1}{(1-\widehat{\lambda_1})*(1-p_H)}\frac{\lambda p_L}{(\lambda+(1-\lambda)*p_H)}>1$.

- If $x_{H2}=0$ and $x_{L2}=0$, then $\widehat{\mu_2}|_{y_2=1}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+\frac{(1-\widehat{\mu_1})*\widehat{\lambda_1}*p_L}{\widehat{\lambda_1}+(1-\widehat{\lambda_1})*p_H}}>\widehat{\mu_1}|_{y_1=1}>\mu$ and $\widehat{\mu_2}|_{y_2=0}=\frac{\widehat{\mu_1}}{\widehat{\mu_1}+(1-\widehat{\mu_1})*\frac{1-\widehat{\lambda_1}p_L}{(1-\widehat{\lambda_1})*(1-p_H)}}=\frac{\mu}{\mu+(1-\mu)*\frac{(1-\widehat{\lambda_1}p_L)}{(1-\widehat{\lambda_1})*(1-p_H)}\frac{\lambda*p_L}{\lambda+(1-\lambda)*p_H}}$. If $\widehat{\mu_2}|_{y_2=0}<\mu$, the optimal strategy of people is $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* and if $\widehat{\mu_2}|_{y_2=1}>\mu$, the strategy of people is $s_1|1=s_1|0=$ *not overthrow*. Therefore, strategies $x_{H2}=0$, and $x_{L2}=0$, and $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* constitute an equilibrium in a continuation game if $\gamma\delta p_L(B+R)>R$ and $\frac{(1-\widehat{\lambda_1}p_L)}{(1-\widehat{\lambda_1})*(1-p_H)}\frac{\lambda*p_L}{\lambda+(1-\lambda)*p_H}>1$.

■

Proof of Proposition 1. We consider the case of the following equilibrium in a continuation game: for any y and any government's strategy in the first period, citizens play $s_2|1=$ *not overthrow*, $s_2|0=$ *overthrow* in the second period. Equilibrium strategies of the government in the second period after $y_1=0$ are computed conditional on γ. In the parameter region in which the solution of a continuation game is given by (1)-(3) of Lemma 2, the continuation payoffs of the government after the first period depend on its type and the value of γ.

In particular, continuation payoffs, denoted by V_H and V_L, are the following:

$$V_H=\begin{cases} B+R+\delta\left(p_H+(1-p_H)(1-\gamma)\right)[B+R] \text{ if } R>\gamma\delta(1-p_H)(B+R) \\ B+\delta[B+R] \text{ if } \gamma\delta p_L(B+R)<R<\gamma\delta(1-p_H)(B+R) \\ B+\delta[B+R] \text{ if } R<\gamma\delta p_L(B+R) \end{cases}$$

$$V_L = \begin{cases} B + R + \delta\left(1-\gamma\right)\left[B+R\right] \text{ if } R > \gamma\delta(1-p_H)(B+R) \\ B + R + \delta\left(1-\gamma\right)\left[B+R\right] \text{ if } \gamma\delta p_L(B+R) < R < \gamma\delta(1-p_H)(B+R) \\ B + \delta\left(p_L + (1-p_L)(1-\gamma)\right)\left[B+R\right] \text{ if } R < \gamma\delta p_L(B+R) \end{cases}$$

We are looking for Perfect Bayesian equilibrium. To find all pure strategy equilibrium, the strategy of each type of the government should be a best response to the strategy of the other type of the government given beliefs. Payoffs of the government are the following:

$U_H(x_{H1} = 1, x_{L1} = 1) = B + R + \delta(p_H + (1-p_H)(1-\gamma)V_H)$

$U_L(x_{H1} = 1, x_{L1} = 1) = B + R + \delta\left(1-\gamma\right)V_L$

$U_H(x_{H1} = 1, x_{L1} = 0) = B + R + \delta(p_H + (1-p_H)(1-\gamma)V_H)$

$U_L(x_{H1} = 1, x_{L1} = 0) = B + \delta(p_L + (1-p_L)(1-\gamma)V_L)$

$U_H(x_{H1} = 0, x_{L1} = 1) = B + \delta V_H$

$U_L(x_{H1} = 0, x_{L1} = 1) = B + R + \delta\left(1-\gamma\right)V_L$

$U_H(x_{H1} = 0, x_{L1} = 0) = B + \delta V_H$

$U_L(x_{H1} = 0, x_{L1} = 0) = B + \delta(p_L + (1-p_L)(1-\gamma)V_L)$

Note that for both types of the government either $x_{i1} = 1$ or $x_{i1} = 0$ is a dominant strategy, i.e. if $x_{i1} = 1$ is a best response to $x_{-i,1} = 1$, it is also a best response to $x_{-i,1} = 1$. So, in order to find a Perfect Bayesian equilibrium, we just need to find out the conditions for dominance of $x_{i1} = 1$ for both $i \in \{H, L\}$.

The optimal strategy of a competent government is $x_{H1} = 1$ if

$$B + R + \delta\left(1 + p_H\gamma - \gamma\right)V_H > B + \delta V_H$$

i.e. if $R > \delta(1-p_H)\gamma V_H$. For $R > \gamma\delta(1-p_H)(B+R)$, this condition can be rewritten as $R > \delta(1-p_H)\gamma(B+R)(1+\delta+\delta p_H\gamma - \delta\gamma)$ and it is equivalent to

$$\gamma^2\delta^2(1-p_H)^2 - \gamma\delta(1-p_H)(1+\delta) + \frac{R}{B+R} > 0. \tag{4}$$

We consider two cases: R is small and R is large. If R is large, and, in particular, $(1+\delta)^2 - \frac{4R}{B+R} < 0$, then for any γ such that $\gamma < \frac{R}{\delta(1-p_H)(B+R)}$, condition (4) is satisfied, and, therefore, $x_{H1} = 1$ is a dominant strategy. If R is small, and, in particular, $\frac{R}{B+R} < \delta$, this implies that for $\gamma = \frac{R}{\delta(1-p_H)(B+R)}$, the left-hand side of (4) is equal to $\frac{R^2}{(B+R)^2} - \frac{R(1+\delta)}{B+R} + \frac{R}{B+R} = \frac{R^2-\delta R(B+R)}{(B+R)^2} < 0$. The derivative of the left-hand side of (4) at this point is $\frac{2R\delta(1-p_H)}{(B+R)} - \delta(1-p_H)(1+\delta)$ which is less than 0, as $\frac{R}{B+R} < \delta$ implies $\frac{2R}{B+R} < 1+\delta$. This implies that the intersection of $\gamma < \frac{R}{\delta(1-p_H)(B+R)}$ and (4) is $[0, \gamma_1]$ where γ_1 is a smaller solution of $\gamma^2\delta^2(1-p_H)^2 - \gamma\delta(1-p_H)(1+\delta) + \frac{R}{B+R} = 0$.

Now, consider the case $\gamma > \frac{R}{\delta(1-p_H)(B+R)}$. The optimal strategy of a competent government is $x_{H1} = 1$ if $R > \delta(1-p_H)\gamma(B+\delta(B+R))$, or, equivalently, if $\gamma < \frac{R}{\delta(1-p_H)(B+\delta(B+R))}$. If R is large, and $R > \delta(B+R)$, this implies that $\frac{R}{\delta(1-p_H)(B+\delta(B+R))} > \frac{R}{\delta(1-p_H)(B+R)}$, and $x_{H1} = 1$ is optimal for $\gamma < \frac{R}{\delta(1-p_H)(B+\delta(B+R))}$. As a result, if R is large, $x_{H1} = 1$ is optimal if $\gamma < \frac{R}{\delta(1-p_H)(B+\delta(B+R))}$, i.e. if γ is sufficiently small. If R is small, this implies that $\gamma < \frac{R}{\delta(1-p_H)(B+\delta(B+R))}$ and $\gamma > \frac{R}{\delta(1-p_H)(B+R)}$ is not a compatible system of inequalities. Overall, if R is small, $x_{H1} = 1$ is optimal if $\gamma < \gamma_1$.

The optimal strategy of an incompetent government is $x_{L1} = 1$ if

$$B + R + \delta(1-\gamma)V_L > B + \delta(p_L + (1-p_L)(1-\gamma)V_L)$$

i.e. if $R > \delta p_L \gamma V_L$. For $R > \gamma\delta p_L(B+R)$, this condition can be rewritten as $R > \delta p_L \gamma (B + R + \delta(1-\gamma)[B+R])$ which is equivalent to

$$\gamma^2\delta^2 p_L - \gamma\delta p_L(1+\delta) + \frac{R}{B+R} > 0. \tag{5}$$

As before, we consider two cases: R is small and R is large. If R is large, and, in particular, $(1+\delta)^2 - \frac{4R}{p_L(B+R)} < 0$, the proof is similar to the previous case. For any γ such that $\gamma < \frac{R}{\delta p_L(B+R)}$, condition (5) is satisfied, and, therefore, $x_{H1} = 1$ is a dominant strategy. If R is small, and, in particular, $\frac{R}{B+R} < \delta p_L$, this implies that for $\gamma = \frac{R}{\delta p_L(B+R)}$, the left-hand side of (5) is equal to $\frac{R^2}{p_L(B+R)^2} - \frac{R(1+\delta)}{B+R} + \frac{R}{B+R} = \frac{R^2 - \delta p_L R(B+R)}{(B+R)^2} < 0$. This implies that the intersection of $\gamma < \frac{R}{\delta p_L(B+R)}$ and (5) is $[0, \gamma_2]$ where γ_2 is a smaller solution of $\gamma^2\delta^2 p_L - \gamma\delta p_L(1+\delta) + \frac{R}{B+R} = 0$.

Now, consider the case $\gamma > \frac{R}{\delta p_L(B+R)}$. The optimal strategy of an incompetent government is $x_{L1} = 1$ if $R > \delta p_L \gamma(B + \delta(p_L + (1-p_L)(1-\gamma))[B+R])$, or, equivalently, if

$$\gamma^2\delta^2 p_L(1-p_L)(B+R) - \gamma\delta p_L(B+\delta(B+R)) + R > 0. \tag{6}$$

If R is large, this implies that the discriminant $\delta^2\left[p_L^2(B+\delta(B+R))^2 - 4Rp_L(1-p_L)(B+R)\right]$ is less than 0, and, consequently, (6) is always satisfied. If, in contrast, R is small, and, in particular, $R < \min\left\{\frac{\delta p_L B}{1-p_L\delta}, \frac{(\delta+\delta^2)p_L B}{1-p_L\delta^2}\right\}$, then the left-hand side of (6) is negative for both $\gamma = \frac{R}{\delta p_L(B+R)}$ and $\gamma = 1$. As a result, if R is small, there is no γ such that (6) is satisfied and $\gamma > \frac{R}{\delta p_L(B+R)}$. Overall, if R is large, $x_{L1} = 1$ is always optimal. If R is small, $x_{L1} = 1$ is optimal if $\gamma < \min\left\{\frac{R}{\delta p_L(B+R)}, \gamma_2\right\}$.

For people, for all strategy profiles except $x_{H1} = 1$, $x_{L1} = 0$, $s_1|1 =$ *not overthrow*, $s_1|0 =$ *overthrow* is a best response as a positive outcome increases the ex-post probability of a high-competent government, while a negative outcome decreases this probability.

As a result, possible equilibria in the first stage are the following. If R is large, the equilibrium set of strategies is $x_{L1} = 1$, $x_{H1} = 1, s_2|1 = \textit{not overthrow}$, $s_2|0 = \textit{overthrow}$ if γ is relatively small (i.e. $\gamma < \frac{R}{\delta(1-p_H)(B+\delta(B+R))}$); $x_{L1} = 1$, $x_{H1} = 0, s_1|1 = \textit{not overthrow}$, $s_1|0 = \textit{overthrow}$ if γ is relatively large (i.e. $\gamma > \frac{R}{\delta(1-p_H)(B+\delta(B+R))}$). If R is small, the equilibrium set of strategies is $x_{L1} = 1$, $x_{H1} = 1, s_1|1 = \textit{not overthrow}$, $s_1|0 = \textit{overthrow}$ if γ is sufficiently small (i.e. $\gamma > \gamma_1$), $x_{L1} = 1$, $x_{H1} = 0, s_1|1 = \textit{not overthrow}$, $s_1|0 = \textit{overthrow}$ if γ is in intermediate range ($\gamma \in \left[\gamma_1, \min\left\{\frac{R}{\delta p_L(B+R)}, \gamma_2\right\}\right]$), and $x_{L1} = 0$, $x_{H1} = 0, s_1|1 = \textit{not overthrow}$, $s_1|0 = \textit{overthrow}$ if γ is sufficiently large (i.e. $\gamma > \min\left\{\frac{R}{\delta p_L(B+R)}, \gamma_2\right\}$.

Equilibria in continuation games are described above in lemma 2. ■

Proof of Proposition 2. From the proof of lemma 2, $\widehat{\mu_1}|_{y_1=0,x_{H1}=1,x_{L1}=1} = \frac{\mu*(1-p_H)}{1-\mu p_H} < \mu$, $\widehat{\mu_1}|_{y_1=0,x_{H1}=0,x_{L1}=1} = \frac{\mu}{\mu+(1-\mu)*\frac{1}{(1-\lambda)*(1-p_H)}} < \mu$, and $\widehat{\mu_1}|_{y_1=0,x_{H1}=0,x_{L1}=0} = \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}} < \mu$. In any case, the risk of predation goes up, as a low-competent government predate more often. ■

Proof of Proposition 3. We can compute the risk of predation in the second period as $Prob(predation|\mu = 0) * Prob(\mu = 0) + Prob(predation|\mu = 1) * Prob(\mu = 1)$. The estimated risk of predation (the risk of predation, estimated by people) is $Prob(predation|\mu = 0) * \widehat{Prob(\mu = 0)} + Prob(predation|\mu = 1) * \widehat{Prob(\mu = 1)}$. If γ is large or γ is small, $Prob(predation|\mu = 0) = Prob(predation|\mu = 1)$, and the change in the risk of predation is generated by the change in $\widehat{Prob(\mu = 1)}$ and, correspondingly, $\widehat{Prob(\mu = 0)}$. In the intermediate range of γ, $Prob(predation|\mu = 1) < Prob(predation|\mu = 0)$, so the change in the risk of predation is higher even if $\mu - \widehat{Prob(\mu = 1)}$ remains the same.

Now we need is to compare $\mu - \widehat{Prob(\mu = 1)}$ in all three types of regimes, i.e., as the proof of lemma 2 suggests, to compare $\mu - \frac{\mu*(1-p_H)}{1-\mu p_H}$, $\mu - \frac{\mu}{\mu+(1-\mu)*\frac{1}{(1-\lambda)*(1-p_H)}}$, and $\mu - \frac{\mu}{\mu+(1-\mu)*\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}}$. Note that $\frac{\mu*(1-p_H)}{1-\mu p_H} = \frac{\mu}{\mu+(1-\mu)*\frac{1}{(1-p_H)}}$. So, we need to compare $\frac{1}{1-p_H}$, $\frac{1}{(1-\lambda)*(1-p_H)}$, and $\frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}$. As $\frac{1}{1-p_H} < \frac{1}{(1-\lambda)*(1-p_H)}$ and $\frac{1}{(1-\lambda)*(1-p_H)} > \frac{1-\lambda p_L}{(1-\lambda)*(1-p_H)}$, in addition to $Prob(predation|\mu = 1) < Prob(predation|\mu = 0)$, the increase in the estimated risk of predation is the largest in the intermediate regimes. ■

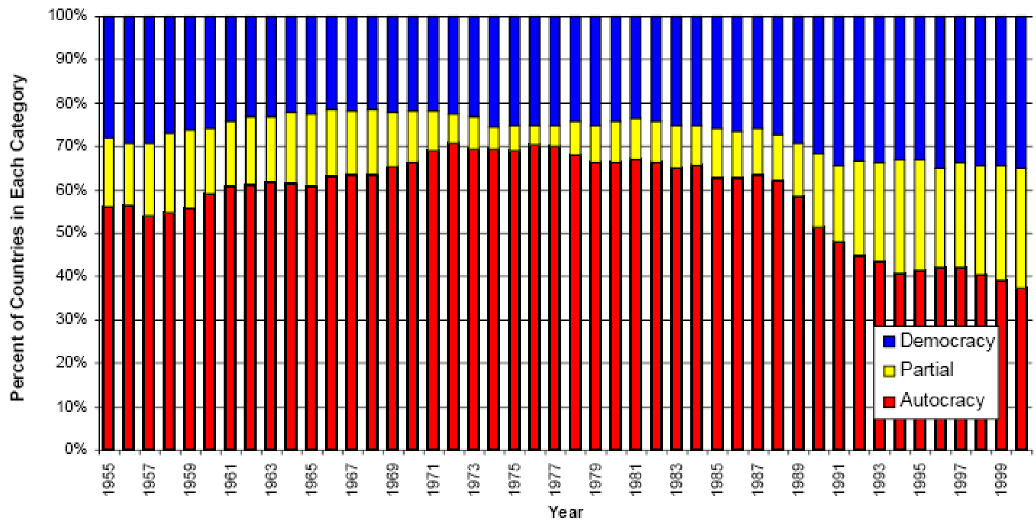


Figure 1. World Democratization Trends, 1955-2000. Reproduced from Epstein, Bates, et al. (2006)

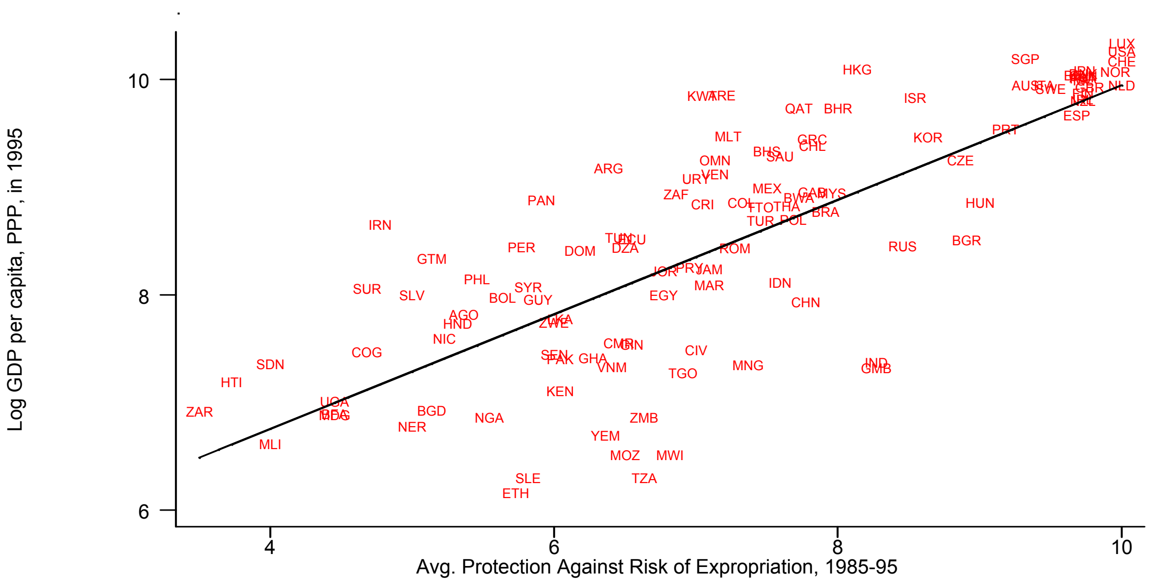


Figure 2. Reproduced from Acemoglu, Daron, Simon Johnson and James A. Robinson (2001) "The Colonial Origins of Comparative Development: An Empirical Investigation" American Economic Review , 91, 1369-1401.

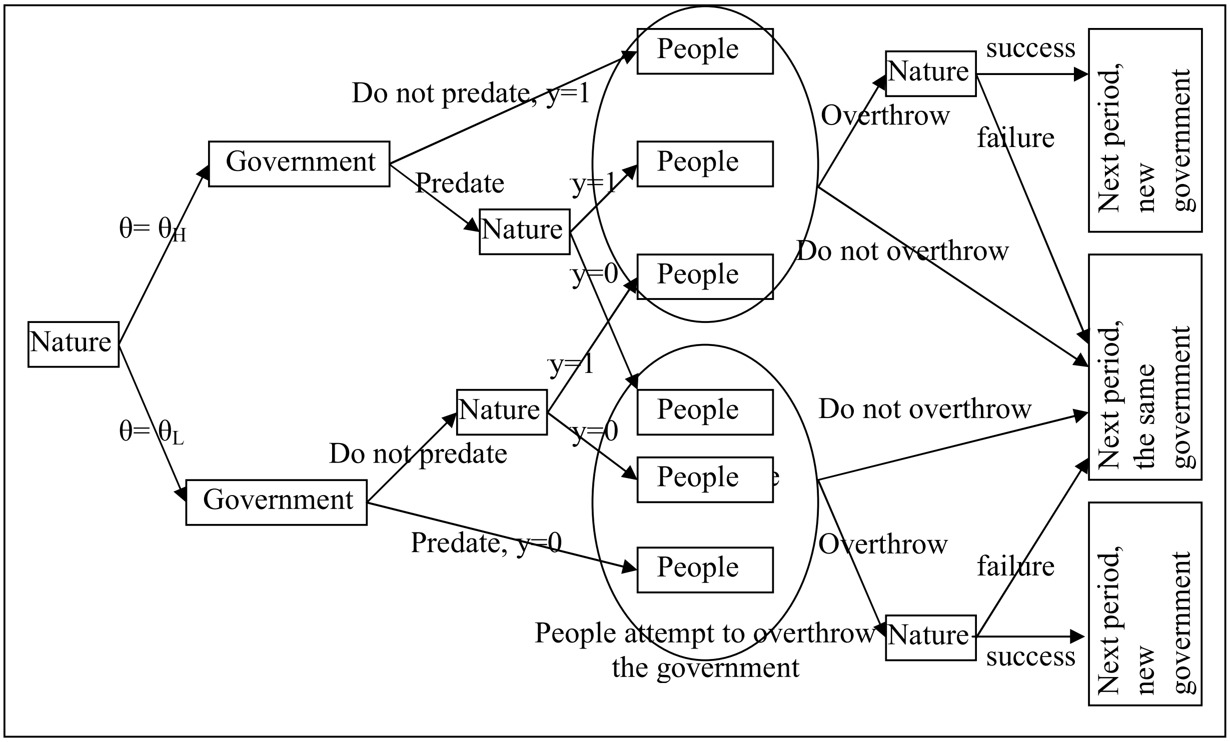


Figure 3. Timing of the first period of stage game. The part of the tree with a short-horizon government is not depicted.

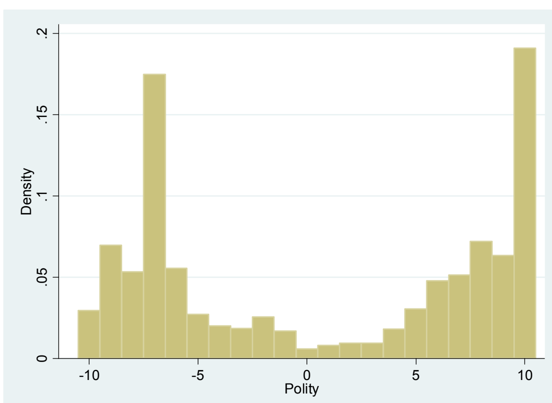


Figure 4. Histogram of Polity variable, 1982-2003 (Polity=Democracy-Autocracy)
Source: Polity IV Project

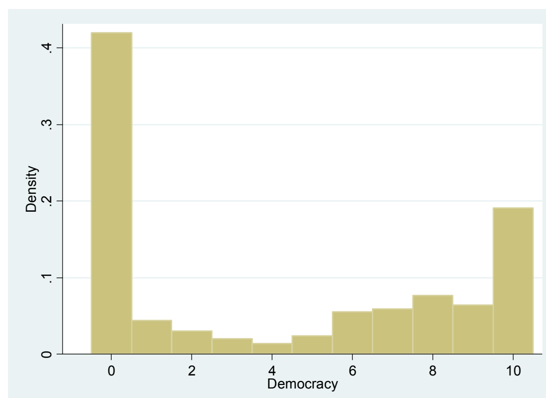


Figure 5. Histogram of Democracy variable, 1982-2003
Source: Polity IV Project

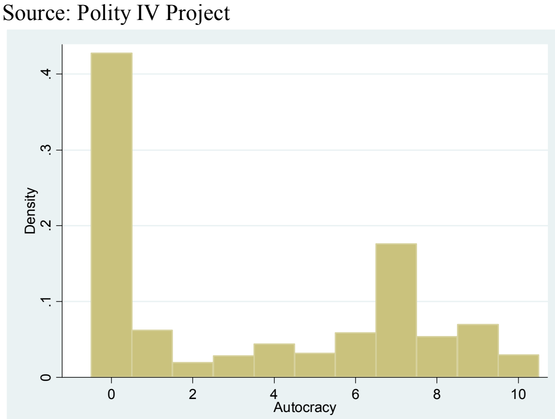


Figure 6. Histogram of Autocracy variable, 1982-2003
Source: Polity IV Project

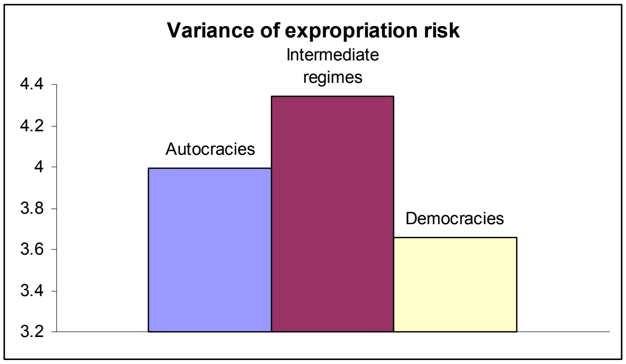


Figure 7. Variance of expropriation risk, by regime type, 1982-2003
Source: IRIS-3, Polity IV Project, authors' calculations.

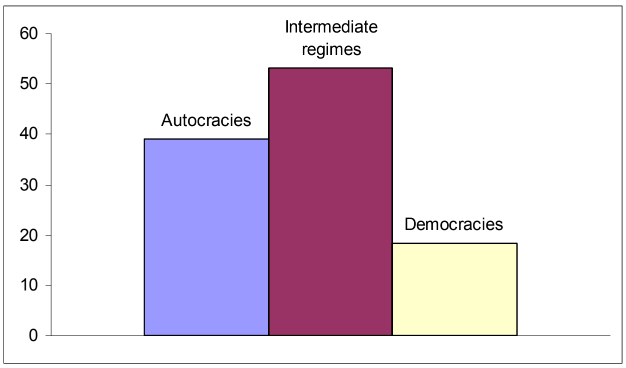
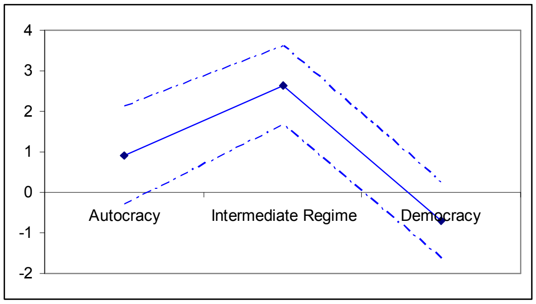
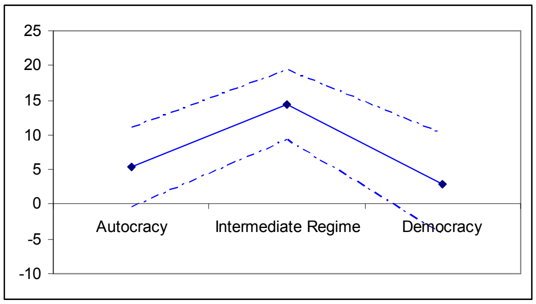


Figure 8. Variance of growth rate, by regime type.
Source: WDI 2005, Polity IV Project, authors' calculations.

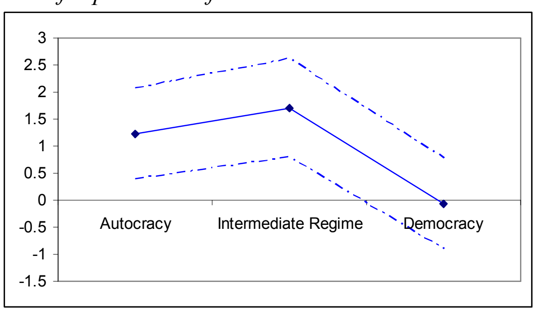
Expropriation risk



Economic Risk



Risk of repudiation of contracts



Financial Risk

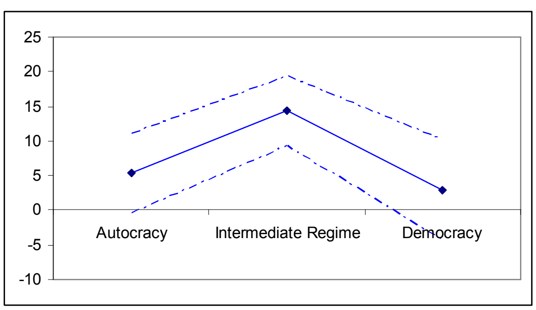


Figure 9. Regression coefficients for collapse effect on risk variables as a function of political regime. Based on the regression from table 6.

Table 1. Equilibria in a game between the government and the citizens. The results of Proposition 1.

	γ is small	γ is intermediate	γ is large
R is small	x_{L1}=1, x_{H1}=1,s_1|1=not overthrow, s_1|0=overthrow	x_{L1}=1, x_{H1}=0,s_1|1=not overthrow, s_1|0=overthrow	x_{L1}=0, x_{H1}=0,s_1|1=not overthrow, s_1|0=overthrow
R is large	x_{L1}=1, x_{H1}=1,s_1|1=not overthrow, s_1|0=overthrow	x_{L1}=1, x_{H1}=0,s_1|1=not overthrow, s_1|0=overthrow	x_{L1}=1, x_{H1}=0,s_1|1=not overthrow, s_1|0=overthrow

Table 2. Economic shocks by region.

A: Negative economic shocks, by region, 1982-2003

World Bank region	*Number of collapses*	*Unconditional probability of having collapse*
Australia and Oceania	42	.286
Center, South and East Asia	69	.145
Eastern Europe/Former USSR	89	.211
Latin America	184	.226
North Africa/Middle East	115	.258
Sub-Saharian Africa	287	.262
Western Europe/North America	75	.140
Total	861	.219

Source: WDI 2005, authors' calculations

B. Average growth variables for economic shocks, by region, 1982-2003

WB Region	*Average growth before*	*Average growth after*	*Average growth change*
Australia and Oceania	4.746	-3.653	-8.399
Center, South and East Asia	3.793	-2.308	-6.101
Eastern Europe/Former USSR	-.962	-9.524	-8.562
Latin America	2.797	-3.577	-6.374
North Africa/Middle East	3.316	-4.133	-7.449
Sub-Saharian Africa	2.169	-5.404	-7.573
Western Europe/North America	2.970	-.4362	-3.406
Total	2.458	-4.503	-6.962

Source: WDI 2005, authors' calculations

Table 3. Natural disasters counted for disaster variable

Disaster type	*Occurrence, 1980-2003*
Earthquake	590
Drought	496
Extreme Temperature	223
Flood	1978
Slides	343
Volcano	104
Wave / Surge	15
Wind Storm	1685

Source: Emergency Disasters Database, EM-DAT 2006

Table 4. Summary statistics and sources of data

Variable	*Source*	*Observations*	*Mean*	*Std. Dev.*	*Min*	*Max*
Expropriation risk	IRIS-3	1945	2.91	2.309	0	9.5
Risk of repudiation of contracts	IRIS-3	1945	3.57	2.343	0	9.5
Economic risk	ICRG	2440	67.50	7.695	50.5	97.5
Financial risk	ICRG	2440	67.69	9.638	50	96
Government stability	ICRG	2453	7.31	2.453	0	12
Polity	Polity IV	3688	0.74	7.592	-10	10
Autocracy dummy	Polity IV, calculations	3230	0.35	0.478	0	1
Intermediate regime dummy	Polity IV, calculations	3230	0.28	0.450	0	1
Democracy dummy	Polity IV, calculations	3230	0.37	0.482	0	1
Collapse dummy	WDI 2005, calculations	4179	0.22	0.416	0	1
Collapse in previous 3 years	WDI 2005 , calculations	4186	0.55	0.497	0	1
Natural disasters	EM-DAT, calculations	5643	1.00	2.401	0	33
Natural disasters in previous 3 years	EM-DAT, calculations	5137	2.99	6.802	0	93
Negative term of trade shock dummy	Rodrik (1999), calculations	5643	0.07	0.263	0	1
Negative term of trade shocks in previous 3 years	Rodrik (1999), calculations	5137	0.25	0.572	0	3
Log (GDP per capita)	WDI 2005	3924	8.20	1.135	5.63	11.08
Openness	WDI 2005	3387	79.92	45.546	1.53	296.38
Log (Population)	WDI 2005	5049	15.20	2.086	9.89	20.97
Vulnerability to natural disasters	EM-DAT, calculations	5643	1.00	2.025	0	17.42
Government change dummy	Leadership duration database, PITF	4173	0.16	0.369	0	1

Table 5. Risk variables and economic shocks, FE.
Economic shocks are instrumented by natural disasters and terms of trade shocks

	Expropriation risk, t+1	*Risk of repudiation of contracts, t+1*	*ICRG Economic Risk, t+1*	*ICRG Financial Risk, t+1*
Economic shock in	4.394	3.77	9.054	18.022
years t, t-1, or t-2	[2.56]**	[2.23]**	[2.92]***	[2.51]**
Log GDP pc,	-0.57	-0.921	-1.571	-2.644
lagged 3 years	[5.40]***	[7.89]***	[8.78]***	[7.04]***
Openness,	-0.002	-0.003	-0.012	-0.016
lagged 3 years	[0.62]	[0.89]	[2.38]**	[1.72]*
Year	-0.225	-0.168	-0.073	0.008
	[10.11]***	[9.38]***	[2.25]**	[0.14]
Log (Population)	0.064	-0.022	0.084	0.078
lagged 3 years	[0.54]	[0.20]	[0.46]	[0.22]
Expropriation Risk,	0.211			
lagged 3 years	[2.73]***			
Risk of repudiation of		0.151		
contracts, l. 3years		[1.34]		
ICRG Economic Risk,			0.385	
lagged 3 years			[11.89]***	
ICRG Financial Risk,				0.253
lagged 3 years				[2.84]***
Observations	1170	1170	1666	1666
Number of countries	116	116	123	123

Absolute value of z statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Risk variables and economic shocks, with interactions, FE
Economic shocks are instrumented by natural disasters and terms of trade shocks

	Expropriation risk, t+1	*Risk of repudiation of contracts, t+1*	*ICRG Economic Risk, t+1*	*ICRG Financial Risk, t+1*
*Shock*Autocracy*	1.087	1.228	2.647	5.294
	[1.20]	[1.47]	[0.52]	[0.92]
*Shock*Intermediate Regime*	2.635	1.707	13.758	14.335
	[2.69]***	[1.87]*	[3.20]***	[2.88]***
*Shock*Democracy*	-0.695	-0.059	6.627	2.892
	[0.75]	[0.07]	[1.21]	[0.40]
Autocracy	-0.223	-0.378	3.884	1.549
	[0.28]	[0.53]	[0.84]	[0.28]
Intermediate Regime	-1.3	-0.479	-2.772	-3.383
	[2.02]**	[0.84]	[0.77]	[0.74]
Log GDP pc, lagged 3 years	-0.165	-0.112	-0.229	0.635
	[3.13]***	[2.37]**	[1.41]	[3.02]***
Openness, lagged 3 years	-0.43	-0.556	-4.045	-6.389
	[0.60]	[0.76]	[1.41]	[1.59]
Year	-0.007	-0.008	-0.015	-0.011
	[1.68]*	[2.17]**	[1.20]	[0.72]
Log (Population) lagged 3 years	-4.288	-4.565	3.815	-33.082
	[3.89]***	[4.51]***	[1.28]	[7.39]***
Expropriation Risk, lagged 3 years	0.097			
	[2.18]**			
Risk of repudiation of contracts, l. 3years		0.112		
		[2.30]**		
ICRG Economic Risk, lagged 3 years			0.042	
			[0.99]	
ICRG Financial Risk, lagged 3 years				0.161
				[2.88]***
Observations	1091	1091	1566	1566
Number of countries	109	109	117	117

Absolute value of z statistics in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%