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## **Internal and external political competition**

by

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## INTERNAL AND EXTERNAL POLITICAL COMPETITION

DAVID HUGH-JONES

**ABSTRACT.** All rulers face political competition, both from rivals within their state, and from other states to which their subjects may exit. In a simple model, both kinds of competition are substitutes. Internal competition (democracy) benefits citizens by allowing them to replace rent-seeking rulers. But it also weakens these rulers' incentives to invest. External competition forces rent-seeking rulers to invest so as to prevent migration. As a result, citizens are less willing to fight for democracy, and rulers are less eager to oppose it, when external competition is high. In a panel of countries, there are fewer changes towards democracy when states have low GDP relative to their neighbours.

**Keywords:** political competition, dictatorship, democracy, transitions

**JEL classification:** D72, H77

### 1. INTRODUCTION

All rulers, democratic or not, face two kinds of political competition. The first is provided by rivals to their rule within their state. The second is external competition from other states - in this context, the possibility that one's citizens may vote with their feet and exit from one's rule.

Both kinds of competition have increased in recent history. There are more democracies, in which internal competition is regular and institutionalized. There are also greater opportunities for exit from many countries. Transport has become safer and cheaper. Many nations have substantial communities living outside the home country, which lower the cultural costs of migration. More countries belong to regional political units like the EU, which lower barriers to movement. While much work on these processes examines the

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resulting changes in bargaining strength between capital and labour, as a result of the presumed relative increase in capital mobility compared to labour mobility, here I simply focus on increasing mobility in general.

This paper asks how the increase in external competition will affect the prospects for democracy. The question is motivated by the observation that, while democracy and interstate competition have both increased, there is no guarantee that either will continue to do so. That depends, in the last analysis, on political will. Also, while the level of interstate competition is largely a characteristic of the international system, the level of democracy is affected more by national factors. So it makes sense to take the level of external competition as given and focus on its effects on democracy. (The reverse direction of causality could also matter – many rulers have restricted the mobility of capital or labour for political reasons. The analysis here assumes that, beyond a certain point, these potential restrictions would be costly or ineffective.)

This question can be answered in many ways. Democracy and external competition might be complements. For instance, the threat of exit might prevent majorities from expropriating minorities, and thus refocus democracy away from zero-sum redistributive conflicts and towards positive-sum policies like the provision of public goods (Boix, 2003). Or, external political competition might substitute for democracy. The strongest version of this would be the Tiebout hypothesis: that migration can provide an efficient market in jurisdictions, without any need for citizen control over government.

In this paper I ignore distributive issues and focus instead on political agency: how citizens can control their rulers. I do not assume that all rulers are self-interested, but instead parametrize the probability of public-spirited and selfish rulers. I also take a simple and relatively optimistic view of migration. Many strands in local political economy show that migration can cause inefficiencies. Here, I model a single country, and treat the cost of migration as providing a simple constraint on rulers' ability to extract rents. This admittedly simplistic approach has some advantages. First, it allows one to examine initial welfare differences between countries: what difference does it make when a country is far behind,

equal with, or ahead of its potential competitors in providing for its citizens? Second, it allows me to examine the effect of different institutions without requiring Nash equilibrium between countries, which adds complexity and is harder to justify.

The argument is the following. Self-interested rulers are bandits, as in Olson (1993). Internal competition (for instance, democracy) provides a benefit: bandits can be replaced by their rivals who are perhaps public-spirited. It also has a cost: bandits who expect to be replaced have a shorter time horizon and are less likely to make investments which increase growth and the future tax base. In general, the optimal level of internal competition balances these two forces. External competition affects this trade-off. By imposing a minimum citizen welfare level which a ruler must satisfy in order to prevent citizens migrating to more attractive regimes, it makes self-interested rulers less harmful compared to the public-spirited type, and so lessens the benefit of democracy. External competition can also affect the ruler's investment incentives: if emigration is too attractive, a bad ruler cannot avoid it, and therefore ceases to invest at all. However, in this extreme case, replacing a bad ruler by a good one still leaves the society below the minimum citizen welfare level, resulting in emigration, so democracy is not helpful. More generally, self-interested rulers' optimal investments are independent of external competition.

As a result, external competition and democracy are substitutes for citizens; more of one means citizens demand less of the other. On the other hand, external competition constrains rulers and limits their profits, making it less beneficial to stay in office. Therefore, an increase in external competition lowers rulers' willingness to fight against democratization. Putting these incentives together, there is more (less) conflict over the level of democracy as external competition falls (rises).

The empirical section tests this theory by examining how Polity scores change over time in different states. I find that states whose GDP is lower than their neighbours, i.e. countries with a high level of external competition, are less likely to experience a change towards democracy in any given year. This conclusion is reasonably robust to different measures of external competition, and for some measures, countries with greater external competition are also less likely to experience a change towards autocracy.

In the following section I discuss the literature. Section 3 introduces the model. Section 4 presents the evidence, and Section 5 concludes.

## 2. LITERATURE

The classic work in this area is Hirschman (1970). Hirschman argues that the ready availability of “exit” may weaken the collective exercise of “voice”, and may even lead to firm collapse. Although I make similar predictions, the driving mechanism is different. For Hirschman, the presence of exit lowers the incentive to engage in costly voice. Here, internal competition is conceived of as citizens’ costless ability to remove unsatisfactory rulers. The downside of this ability is that rulers’ incentives to invest for the long term are weakened by the prospect of their removal.

Starting with Tiebout (1956), an economic literature on local governments – where local means those with a possibility of exit – has examined whether exit alone can induce efficiency in production of public goods.<sup>1</sup> The overall conclusion is negative. Indeed, in general the existence of equilibrium is not guaranteed (Westhoff, 1977) and when it exists it may not be Pareto-optimal. If property is immobile, local governments will extract rent from the property market (Epple and Zelenitz, 1981); consumers ignore their effect on economies of scale, and other possible externalities, when considering whether to move or not (Bewley, 1981). These conclusions hold whether or not policy is democratic, and even if democratic policy is efficient after migration decisions have been fixed. Thus, this paper does not demonstrate the superiority of the market in jurisdictions over democracy. Instead, it reaches *positive* conclusions about the demand for democracy within a particular country, and how this varies with the availability of external options.

Political scientists, political economists and others have long debated the effects of globalization on policy. Does increased competition between nations lead to a “race to the bottom” in welfare provision? Or are welfare states natural complements to trade openness by cushioning the blows of against economic change? Does it eliminate the inefficiencies

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<sup>1</sup>For a thorough review see Scotchmer (2002).

of “Leviathan” governments? Does it lead to policy convergence? By contrast, the literature examining the effect of competition on political institutions is comparatively small. Gourevitch (1978) reviewed explanations of the role of trade in shaping the historical evolution of states. In these, a state’s relative position affects its possible economic strategies, thereby the interests of social groups, and thereby possible political coalitions. Katzenstein (1985), a classic in this field, examines how exposure to the world economy affects political arrangements in small open economies, arguing in particular that it explains their propensity to use proportional representation. The only formal work I am aware of is Boix (2003). In his model, increased openness, specifically more mobility of capital, allows for greater democracy since capital owners are less afraid of democratic redistribution. By contrast, here democracy is solely a way to discipline incumbent rulers. A model encompassing both redistribution and disciplinary effects could clarify the range of these opposite predictions.

### 3. A SIMPLE MODEL OF POLITICAL COMPETITION

There are two periods. The economy has a public and a private good. The representative consumer receives

$$(3.1) \quad u_t = u((1 - \tau_t)y_t, g_t)$$

in each period  $t \in \{1, 2\}$  where  $y_t$  is his gross private income,  $\tau$  is the tax rate,  $g_t$  is the level of the public good. The common discount rate is  $\delta$ . For specificity I assume

$$(3.2) \quad u(x, g) = x + \alpha \log g$$

where  $\alpha$  parametrizes the importance of the public good. The public good is produced by long-term investment,  $g_1 = L_0$  and  $g_2 = L_0 + L_1$ . I take initial investment  $L_0$  as fixed and can therefore ignore its effect on period 1 utility. I also fix  $L_2 = 0$  and write  $L_1$  as  $L$  to simplify notation.

Investment is financed by taxation. The tax level is decided by a ruler who can also steal and consume  $R_t$  of the revenue. The budget constraint is thus  $\tau_t y(\tau_t) = L_t + R_t$ . For simplicity I set  $y(\tau) = 1$ , so there is no deadweight cost of taxation, but tax rates are limited to  $\tau_t \in [0, \theta]$ , for example because of an informal sector.

There are two types of rulers. A proportion  $\gamma$  of rulers are Good types who maximize the utility of the consumer  $U = u_1 + \delta u_2$ . The remainder are Bad types who maximize their total revenue  $R = R_1 + \delta R_2$ . Voters observe ruler type after period 1. This gives a benchmark optimistic view of democracy: voters can predict ruler behaviour in period 2, and infer period 1 investments, from the ruler type.<sup>2</sup>

There are two kinds of political competition. First, there is internal political competition from within the state. At the start of period 2, with probability  $d \in [0, 1]$  the citizens decide whether to replace the ruler or not.  $d$  can represent the probability of a fair election in a democracy, or the probability of a chance to revolt in a dictatorship. (One underlying model could be that leaders are removed when political activists solve a coordination problem, which they do with some probability  $d$ , and when the people support the activists.) I sometimes refer to  $d$  as the level of democracy.

Second, there is external political competition from other states. Any consumer can receive utility

$$(3.3) \quad \underline{u} = u(y_f, g_f) - c_e$$

by paying a cost  $c_e$  to move to the foreign economy which provides net income  $y_f$  and public goods level  $g_f$ . The decision to move is made at the beginning of period 2, after that period's utility is revealed, but before it is experienced.<sup>3</sup> (This is a technical manoeuvre which sets  $\underline{u}$  as the lowest utility that all rulers must provide. For simplicity's sake, there is no possibility of moving abroad in period 1. Allowing this would be equivalent to imposing

<sup>2</sup>Incomplete information would bring in further interesting issues, by giving bad types an incentive to mimic good types, and good types an incentive to differentiate themselves. This is left for future work.

<sup>3</sup>In an extension available on request, I allow costs of moving to vary among citizens. The conclusions of the model continue to hold in this setting.



a different limit on period 1 taxation (i.e. requiring  $0 \leq \tau \leq \theta_t$  for  $t = 1, 2$ ), which would not make a substantive difference to the analysis.)

Finally, I make some ad hoc assumptions to focus on the cases of interest:

$$(3.4) \quad \delta\alpha - \theta \leq L_0 \leq \delta\alpha$$

$$(3.5) \quad 1 - \theta + \alpha \log L_0 \leq \underline{u} \leq 1 - (\alpha - L_0/\delta) + \delta(1 + \alpha \log \delta\alpha).$$

(3.4) assures that the welfare-maximizing taxation level in period 1 will be interior. (3.5) means that the migration constraint will not be satisfied without some investment and with maximal taxes, but will be satisfied by the efficient period 1 taxation level, and this will give higher welfare than setting period 1 taxation to 0 and allowing migration.

**3.1. Ruler behaviour.** In period 2, the good type sets  $\tau_2 = 0$  and gives voter utility of  $\max\{\underline{u}, 1 + \alpha \log(L + L_0)\}$ . The bad type solves  $\max\{\tau_2 : 1 - \tau_2 + \alpha \log(L + L_0) \geq \underline{u}\}$  and gives voter utility of  $\max\{\underline{u}, 1 - \theta + \alpha \log(L + L_0)\}$ . He extracts rent of

$$(3.6) \quad R_2(L) = \begin{cases} \theta & , 1 - \theta + \alpha \log(L + L_0) \geq \underline{u} \\ 1 - \underline{u} + \alpha \log(L + L_0) & , 1 + \alpha \log(L + L_0) \geq \underline{u} > 1 - \theta + \alpha \log(L + L_0) \\ 0 & , \underline{u} > 1 + \alpha \log(L + L_0). \end{cases}$$

The voters always reelect a good type and replace a bad type. (This is true whether or not  $L$  is observed, since the bad type always extracts more period 2 rent.)

In period 1, the good type is sure of reelection and solves

$$(3.7) \quad \max_{\tau_1} 1 - \tau_1 + \delta \max\{\underline{u}, 1 + \alpha \log(\tau_1 + L_0)\}.$$

(3.4) and (3.5) imply an interior optimum at  $\tau_1 = L = \delta\alpha - L_0$ , which provides greater citizen utility than setting  $\tau_1 = 0$  and allowing migration to provide  $1 + \delta\underline{u}$ .

The bad type's problem is to balance the attractions of rent now against the benefits of extra future rents from investment now, assuming that he remains in office. I characterize his behaviour as follows:

**Lemma 1.** *Define  $E = (1 - d)\delta\alpha$ . If  $E \leq \max\{L_0, \exp(\frac{u-1}{\alpha})\}$  then the bad type sets  $L = 0$ . Otherwise, the bad type sets  $L = E - L_0$ . In all cases, the bad type sets the maximum period 1 tax rate  $\tau_1 = \theta$ .*

All proofs are in the Appendix.

The value  $E$  gives the bad type's efficient level of investment, given his chances of staying in power. The downside of internal competition (higher  $d$ ) is that  $E$  is lowered: rulers who do not expect to stay in power have no reason to invest.

3.2. **Citizen welfare.** Denote expected citizen welfare in the model by  $U_{CI}$ . In general one can write

$$(3.8) \quad U_{CI} = \underbrace{\gamma U_{max}}_{\text{good type in period 1}} + (1 - \gamma) \{ 1 - \theta + \delta [ \underbrace{(1 - d\gamma)u}_{\text{bad type in period 2}} + \underbrace{d\gamma U_{g2}}_{\text{good type in period 2}} ] \}$$

Here,  $U_{max} \equiv 1 - \delta\alpha + L_0 + \delta[1 + \alpha \log \delta\alpha]$  is the maximum possible welfare, from a good ruler's welfare-maximizing choice  $L = \delta\alpha - L_0$ .  $d\gamma$  is the probability of a bad ruler being succeeded by a good one. A bad type in period 2 always gives citizen utility of  $u$ , either because citizens migrate, or because he extracts the maximum possible rent to prevent this. The interesting action is in  $U_{g2}$ , which is the utility when a bad type is replaced by a good type. This varies depending on the period 1 investment decision taken by the bad type. If this was low, perhaps because the bad type expected to be thrown out by the citizens, then even the good ruler will be unable to achieve very high citizen welfare. On the other hand, if the bad type invested more, expecting to recoup his investment, then the good ruler will be able to build on this investment and achieve high welfare. The trade-off is that bad types only invest much if the probability of being thrown out and replaced by a good type is low.

The complete formula for citizens' utility is as follows.

**Lemma 2.** *Citizen utility can be written*

$$(3.9) \quad U_{CI} = \gamma U_{max} + (1 - \gamma) \{1 - \theta + \delta[(1 - d\gamma)\underline{u} + d\gamma U_{g2}]\}$$

where

$$(3.10) \quad U_{g2} = \max\{\underline{u}, 1 + \alpha \log L_0, 1 + \alpha \log E\}.$$

The value of  $U_{g2}$  can be understood like this. By the migration constraint, it can never be less than  $\underline{u}$ . If the dictator's efficient level of investment  $E$  is less than the existing level of investment  $L_0$ , the dictator invests nothing. Otherwise, the dictator invests up to his efficient level. Thus, the maximum of these three possibilities gives citizen utility.

I can now answer the fundamental question: how do changes in  $\underline{u}$  affect the tradeoff between different levels of democracy? Figure 3.1 on page 10 shows two examples of welfare plotted against democracy.<sup>4</sup> For low values of  $d$ , utility is concave in  $d$ , because of the tradeoff between the greater chance of replacing a bad by a good ruler, and the resulting lower investment from the bad ruler. For high enough values of  $d$  the bad ruler invests nothing anyway. Then more democracy is always better. So, as the picture shows, there are two different possibilities for the best level of democracy: it may be interior, or it may be at the maximum. Along the higher line, with stronger external competition  $\underline{u}$ , the optimal level of  $d$  is interior. The lower line with less external competition has  $d = 1$  optimal.

The next Lemma confirms this intuition: when  $\underline{u}$  increases, the benefit of democracy to citizen welfare, measured by the slope  $\partial U_{CI} / \partial d$ , decreases.<sup>5</sup>

**Lemma 3.**  $\frac{\partial^2}{\partial d \partial \underline{u}} U_{CI} \leq 0$  whenever the cross-partial exists, with strict inequality whenever the bad type invests positively.

Next, write  $d^*$  for the value(s) of  $d$  that maximizes  $U_{CI}$ . As the Lemma suggests:

<sup>4</sup>Parameters for the two lines are  $\underline{u} = 1.7$  and  $\underline{u} = 1.9$  respectively, with  $\gamma = 0.5$ ,  $\alpha = 3$ ,  $\delta = 1$ ,  $L_0 = 1.5$  and  $\theta = 0.5$ .

<sup>5</sup>As Figure 3.1 shows, the slope is not always defined.

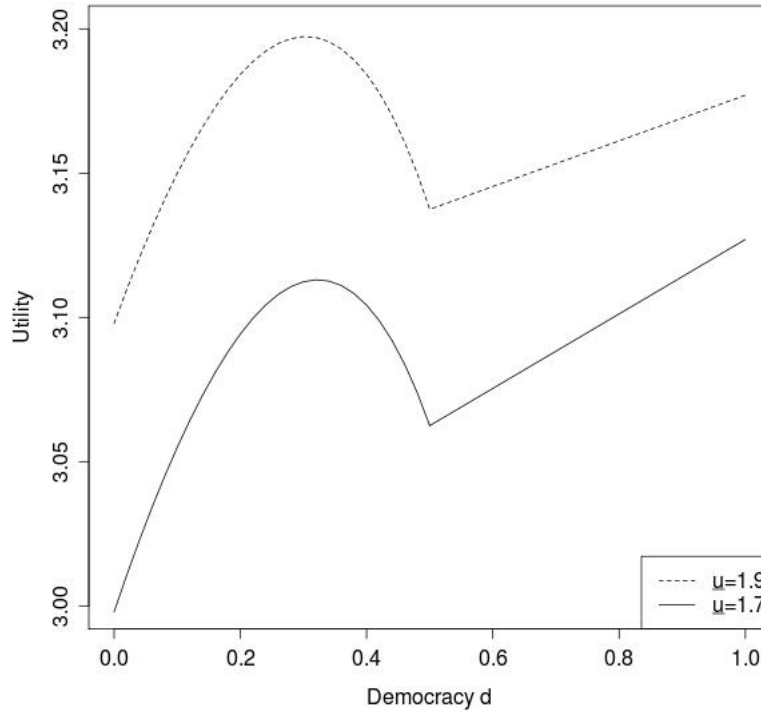


FIGURE 3.1. Citizen utility by level of democracy.

**Proposition 4.** *The welfare-maximizing level of democracy  $d^*$  is weakly decreasing in the level of external competition  $\underline{u}$ , and strictly decreasing when  $d^*$  is interior.*

Indeed, Figure 3.1 shows that for some parameter values, a small decrease in  $\underline{u}$  causes a discontinuous jump from  $d^* \in (0, 1)$  to  $d^* = 1$ .

This is the central substantive result: external competition makes democracy less attractive for citizens. However, rather than test it directly, I examine its consequences for a model of political transitions.

**3.3. Ruler motivations and political transitions.** Having discussed the citizens' optimal level of  $d$ , I consider the ruler's optimal level. The good type, who is always reelected, is indifferent between levels of  $d$ . Not surprisingly, bad type rulers prefer less democracy.

Since external competition constrains the period 2 tax take, external and internal competition are *complements for the ruler*: more external competition makes democracy less bad.

**Lemma 5.** The bad type ruler's expected utility is weakly decreasing in  $d$  and has increasing differences in  $d$  and  $\underline{u}$ .

Intuitively, when the level of democracy is decided by a costly struggle between citizens and rulers, a higher level of external competition will make both sides' stakes lower. If so, then regime change should be a smoother, less conflictual process in states with high external competition. The simplest model to show this is as follows: suppose that before the start of the game, rulers get an opportunity to decrease  $d$  by some small amount  $\Delta$ , at a cost  $c$ . Suppose that such opportunities arrive with a distribution  $\Phi(c)$  of costs, with support on  $[0, \infty)$ . Then, Lemma 5 shows that bad type rulers will take fewer of them when  $\underline{u}$  is high, since the benefit of a decrease in democracy is smaller for higher  $\underline{u}$ . Similarly, if citizens get an opportunity to increase  $d$  by some small  $\Delta$  at stochastic cost, Lemma 3 suggests that when  $\underline{u}$  is high the benefit of an increase in  $d$  is smaller and so citizens will take fewer opportunities.<sup>6</sup> The next Proposition confirms this.

**Proposition 6.** When external competition increases, there will be fewer changes in the level of internal competition.

#### 4. EVIDENCE

Proposition 6 predicts more reforms both towards and away from democracy when external competition is low.

*Hypothesis 1a.* Democratic reforms will be more likely when states are insulated from external competition.

*Hypothesis 1b.* Changes away from democracy will be more likely when states are insulated from external competition.

<sup>6</sup>I assume that if citizens would prefer a lower level of  $d$ , rulers will implement this anyway.

There is an obvious confound. Rulers who are particularly secure from citizen pressure may be better able to limit  $u$  by their own policy choices, for example by banning foreign travel, and may have less to fear from the political consequences of doing so. And, as in the model, bad type rulers may have an incentive to limit  $u$  so as to extract higher levels of rent. These factors will make the correlation between democracy and external competition more positive, loading the dice against the hypotheses, if the measure of external competition is affected by rulers' choices.

To test these hypotheses, I examine a panel of countries from 1950-2006, using changes to the Polity IV democracy score to measure changes towards and away from democracy. I estimate the following model:

$$\text{Logodds}(D_{it}) = \alpha + \beta u_{it} + X_{it} \gamma + \varepsilon_{it}$$

where  $D_{it}$  is a dummy variable which equals one when a change to or away from democracy took place in country  $i$  in year  $t$  (i.e. the Polity score changed);  $u_{it}$  is a measure of external competition; and  $X_{it}$  is a set of control variables.<sup>7</sup> The focus is different from traditional approaches which are concerned to measure democratic or autocratic “transitions” – i.e. relatively long-lasting changes. Since the underlying theory is about the process of political conflict, more than the eventual outcome, I am interested even in changes which are soon reversed. However, I look to the literature on transitions for controls, *faute de mieux*.

For a measure of external competition I took the average per-capita GDP in neighbouring countries (defined as those within a 500 mile radius), divided by per-capita GDP for the country itself. Controls were logged GDP per capita, polity IV score and its square, times since the last change to and away from democracy, and their squares. I also included per-country fixed effects. Since many variables used in the literature to predict democratic transitions, including ethnolinguistic fractionalization, inequality, oil, and Islam, are rather

<sup>7</sup>A more technically correct, but less widely understood approach is to estimate a multinomial logit with three categories (change to democracy, change away from democracy, no change). Results are similar to those reported here (the coefficient on neighbour GDP for changes towards democracy is significant at 0.1%) and are available on request.

	Change towards...	
	Democracy	Autocracy
Nbr. GDP/own GDP	-.4345458* (0.1790191)	-.3106026 (.2258165)
Log GDP	-.4951824 (.3911094)	-1.368872* (.5329211)
Last dem trans	.005054 (.0311766)	.0021302 (.0427713)
(Last dem trans) <sup>2</sup>	.0016018* (.0006459)	-.0016535 (.0009897)
Last aut trans	-.0518179** (.0288789)	.0996754* (.0488996)
(Last aut trans) <sup>2</sup>	.0003157** (.0006299)	.0006336 (.0011406)
Polity	.2113268*** (.0311044)	-.3092959 (.0603369)
Polity <sup>2</sup>	-.0276209*** (.0049156)	-.0124965*** (.0090483)
N	2812	2285
$\chi^2$	91.05	59.08

Robust s.e.s clustered by country, in brackets. Country dummies not shown.

Significance levels: \* < 5%, \*\* < 1%, \*\*\* < 0.1%.

TABLE 1. Probability of changes in level of democracy: FE models

stable over time (or time-varying data is not available), country fixed effects are likely to account for much of their power.

Table 1 reports the results. The ratio of neighbours' to own GDP has the expected sign in every case, and is significant in the FE model for democratic transitions.

As an alternative specification, I ran population-averaged models with a per-country AR(1) error process. This means I fail to control so well for unobserved country characteristics. On the other hand, the ability to use time-invariant independent variables means that, as well as the GDP ratio measure, I can examine alternative measures of  $\underline{u}$  that are more likely to be exogenous. I tried several such variables. First, distance from an OECD member<sup>8</sup> is likely to be a proxy for ease of migration, since much of world migration is to these countries. Second, I hypothesize that landlocked countries will have fewer contacts and trade with the outside world, and therefore less external competition. Third, trade openness may proxy for the ease with which capital can exit the country. Lastly, I examined the ratio

<sup>8</sup>that is, to a country that joined the OECD before 1990

of GDP in countries sharing a common language over own-country GDP, on the theory that these countries are likely to provide alternatives for migration. As controls, I include percent muslim, ethnolinguistic fractionalization, percent of imports and exports from fuel, and polity score and its square: all of these are hypothesized in the literature to affect the probability of political transitions. Table 2 shows the results. The independent variables are mainly of the expected sign, and they achieve significance in several cases.

## 5. CONCLUSION

Increasingly effective external competition will affect states' policies in the short run, and may alter their political system in the long run. This paper puts forward a simple theory: external competition substitutes for internal competition, either at the institutional level, or in terms of citizen behaviour. When democracy has costs as well as benefits - as may be the case in many developing countries - increasing external competition will alter the tradeoffs for both rulers and citizens, resulting in more political stability but also perhaps less democracy. In countries where democratic institutions are thoroughly embedded, the changes might take place in a different way, perhaps through greater delegation to actors which are insulated from democratic processes.

One can also ask about the effect of external competition within democracies, holding institutions constant. A possible interpretation of the model, not developed here, is that  $d$  measures citizen involvement and interest in politics. On this account, there can be such a thing as a too active citizenry, and citizens themselves will rationally take a more relaxed view of their democratic responsibilities when it is easy to vote with ones' feet. This hypothesis could be tested with data on local governments in an advanced country.

Many questions remain to be answered. In particular, distributive issues are beyond the scope of the model. When these are taken into account, an "exit option" might complement democracy by assuaging some citizens' fears of zero-sum redistribution. More encompassing theory is needed to address this issue. For other cases, such as governments which are constrained by constitutional rules or lack of state capacity from large-scale redistribution, the model here is parsimonious and has some support in existing data.



	Change towards...									
	Democracy					Autocracy				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Nbr GDP/own GDP	0.102 (0.192)	-	-	-	-	0.149 (0.232)	-	-	-	-
OECD distance	-	0.0000594 (0.0000677)	-	-	-	-	0.000193** (0.0000731)	-	-	-
Landlocked	-	-	-0.00658 (0.355)	-	-	-	-	0.164 (0.772)	-	-
Trade openness	-	-	-	-0.00962* (0.00468)	-	-	-	-	-0.00282 (0.00705)	-
Common language GDP/own GDP	-	-	-	-	-0.186 (0.130)	-	-	-	-	-0.399* (0.172)
Log(GDP)	-0.854 (0.471)	-0.872*** (0.238)	-0.896*** (0.252)	-0.428 (0.278)	-1.11*** (0.230)	-0.996** (0.334)	-0.740* (0.286)	-0.629* (0.294)	-0.475 (0.369)	-1.30*** (0.343)
% Muslim	-0.00531 (0.00297)	-0.000450 (0.00448)	-0.00246 (0.00369)	0.00242 (0.00375)	-0.00167 (0.00330)	0.00654 (0.00727)	0.00622 (0.00885)	-0.000796 (0.00866)	0.00103 (0.00984)	0.00376 (0.00837)
Fuel	0.0163 (0.0107)	0.00434 (0.0857)	0.00554 (0.00904)	0.00742 (0.00892)	0.00540 (0.00866)	-0.0829761* (0.0364)	-0.0386 (0.0220)	-0.0370 (0.0220)	-0.0464 (0.0253)	-0.0314 (0.0217)
ELF	-1.65 (0.951)	-1.66* (0.795)	-1.39* (0.671)	-0.543 (0.726)	-1.30* (0.641)	-1.07 (1.24)	-0.839 (0.967)	-0.149 (0.874)	0.199 (0.950)	-0.0730 (0.807)
Polity	0.0648** (0.0195)	0.0606* (0.0299)	0.0572 (0.0309)	0.0363 (0.0287)	0.0466 (0.0281)	-0.141** (0.0499)	-0.0847* (0.0403)	-0.0979* (0.0427)	-0.109* (0.0438)	-0.109** (0.0405)
Polity <sup>2</sup>	-0.0270*** (0.00707)	-0.0232*** (0.00436)	-0.0240*** (0.00470)	-0.0263*** (0.00427)	-0.0219*** (0.00416)	-0.0155** (0.00568)	-0.01762** (0.00512)	-0.0200*** (0.00494)	-0.0198*** (0.00516)	-0.0162** (0.00508)
Constant	6.47 (4.03)	6.29*** (2.09)	6.65** (2.20)	2.88 (2.46)	8.67*** (1.99)	6.30* (3.07)	3.407 (2.635)	3.13 (2.78)	1.89 (3.32)	9.20*** (2.92)
N	911	1700	1700	1482	1700	911	1700	1700	1482	1700
Num. countries	31	53	53	46	53	31	53	53	46	53
$\chi^2$	99.8	95.2	97.0	84.5	108	39.5	83.8	68.7	69.7	64.2

Robust s.e.s clustered by country. Significance levels: \* < 5%, \*\* < 1%, \*\*\* < 0.1%.  
 TABLE 2. Probability of changes in level of democracy, population-averaged models

INTERNAL AND EXTERNAL POLITICAL COMPETITION

APPENDIX

**Proof of Lemma 1.** The bad type will never choose  $L > 0$  so that  $1 - \theta + \alpha \log(L + L_0) > \underline{u}$ , since if so he could lower  $L$  and still ensure the same utility in period 2. He also never chooses  $L > 0$  so that  $1 + \alpha \log(L + L_0) \leq \underline{u}$ , since if so he is unable to set a positive tax rate in period 2, and thus gains nothing from his investment. Hence

$$(5.1) \quad L > 0 \Rightarrow 1 - \theta + \alpha \log(L + L_0) = \underline{u}$$

and if  $L > 0$ , one can use (3.6) to set  $R_2(L) = 1 - \underline{u} + \alpha \log(L + L_0)$ , and write the bad type's problem as

$$\begin{aligned} \max_{\tau_1, L} \quad & \tau_1 - L + (1 - d)\delta R_2(L) & \text{s.t.} \\ & \tau_1 \leq \theta \\ & \tau_1 \geq 0 \\ & L \leq \tau_1 \\ & R_2(L) \geq 0 \end{aligned}$$

The Lagrangian is

$$\mathcal{L} = \tau_1 - L + (1 - d)\delta(1 - \underline{u} + \alpha \log(L + L_0)) + \lambda_1(\theta - \tau_1) + \lambda_2 \tau_1 + \lambda_3(\tau_1 - L) + \lambda_4 R_2(L)$$

with the usual constraints. First write

$$\frac{d\mathcal{L}}{d\tau_1} = 1 - \lambda_1 + \lambda_2 + \lambda_3 = 0$$

which immediately shows that  $\tau_1 = \theta$  (since all the  $\lambda$ 's are non-negative, it must be that  $\lambda_1 > 0$ ). The logic is simple: high period 1 taxation is a fait accompli and does not affect either the voters' migration or their selection decisions when types are known. Our problem

simplifies therefore to

$$\begin{aligned} \max_L \theta - L + (1-d)\delta(1-\underline{u} + \alpha \log(L+L_0)) \quad & s.t. \\ L & \leq \theta \\ R_2(L) & \geq 0 \end{aligned}$$

Note that the maximand is strictly concave in  $L$ , so any solution will be unique. Can  $L = \theta$ ? If so, by (5.1) it must be that  $1 - \theta + \alpha \log(\theta + L_0) = \underline{u}$ . This will not generically be the case. Thus I need only consider the constraint that period 2 revenue is positive. Differentiating  $R_2$  gives  $\alpha/(L+L_0)$  so the FOC is:

$$(5.2) \quad -1 + \frac{(1-d)\delta\alpha + \lambda_4}{L+L_0} = 0 \Leftrightarrow L+L_0 = (1-d)\delta\alpha + \lambda_4$$

There are two solutions: if  $\lambda_4 > 0$  then  $R_2(L) = 0$ . In this case, however,  $L = 0$  must be superior to this solution since investment yields no return in period 2. If  $\lambda_4 = 0$  then  $L+L_0 = (1-d)\delta\alpha$  and  $R_2(L) \geq 0$  implies  $(1-d)\delta\alpha \geq \exp\left(\frac{\underline{u}-1}{\alpha}\right)$ . Write  $E = (1-d)\delta\alpha$ . At an interior optimum,  $L+L_0$  is at  $E$ ; this is the efficient level of investment from the point of view of the dictator.  $E$  is decreasing in the level of democracy and increasing in the benefit of the public good and the dictator's discount rate.

There are the following cases.

1. If  $E \leq L_0$  then (5.2) cannot be satisfied for  $L > 0$  and  $\lambda_4 = 0$ . Therefore utility is decreasing in  $L$  from  $L = 0$  and  $L = 0$  must be optimal. In this case, investment is inefficient from the ruler's point of view. Also, if  $E \leq \exp\left(\frac{\underline{u}-1}{\alpha}\right)$  then again  $L = 0$  is optimal: the interior optimum would not satisfy the migration condition and hence yield nothing; to satisfy the migration condition would require a higher than optimal investment. So the optimal investment will be the lowest investment that just satisfies the migration condition. But if so then  $R_2(L) = 0$ . But the bad type can choose  $L = 0$  and still achieve  $R_2(0) = 0$  without wasting resources.

2. If  $E > L_0$  and  $E > \exp\left(\frac{\underline{u}-1}{\alpha}\right)$  then one must manually compare the two solutions,  $L = 0$  giving  $\theta + (1-d)\delta R_2(0)$ , and  $L = E - L_0$  giving  $\theta - (E - L_0) + (1-d)\delta[1 - \underline{u} + \alpha \log E]$ .

Write  $L^* = E - L_0$  for the interior optimum investment level, and consider two cases.

2a. Suppose  $\underline{u} < 1 + \alpha \log(L_0)$ . Thus the migration constraint can be satisfied at  $L = 0$ , but the ruler may prefer to satisfy it by investment if this is more efficient from his point of view than lowering period 2 taxes.  $R_2(0) = \theta + (1-d)\delta[1 - \underline{u} + \alpha \log L_0]$ . Indeed, the ruler chooses  $L = L^*$  iff

$$\begin{aligned} \theta - (1-d)\delta\alpha + L_0 + (1-d)\delta[1 - \underline{u} + \alpha \log(1-d)\delta\alpha] &\geq \theta + (1-d)\delta[1 - \underline{u} + \alpha \log L_0] \\ \Leftrightarrow L_0 + (1-d)\delta\alpha(\log(1-d)\delta\alpha - 1) &\geq (1-d)\delta[\alpha \log L_0] \\ \Leftrightarrow L_0 + E(\log E - \log L_0 - 1) &\geq 0 \\ \Leftrightarrow \log E - \log L_0 - 1 &\geq -\frac{L_0}{E} \\ \Leftrightarrow \log \frac{E}{L_0} &\geq 1 - \frac{L_0}{E} \\ \log \frac{L_0}{E} &\leq \frac{L_0}{E} - 1 \end{aligned}$$

and this inequality holds for any value of  $\frac{L_0}{E}$ . Thus the ruler always chooses  $L = L^*$ : some investment is always efficient.

2b. Suppose  $\underline{u} \geq 1 + \alpha \log(L_0)$ . Then  $R_2(0) = 0$  since citizens migrate. Thus total revenue  $R(0) = \theta$ . On the other hand,  $R(L^*) = \theta - E + L_0 + (1-d)\delta[1 - \underline{u} + \alpha \log E]$ . The ruler chooses  $L = L^*$  iff

$$\begin{aligned} \theta - E + L_0 + (1-d)\delta[1 - \underline{u} + \alpha \log E] &\geq \theta \\ (5.3) \quad \Leftrightarrow L_0 - E &\leq (1-d)\delta[1 - \underline{u} + \alpha \log E]. \end{aligned}$$

Since  $E > L_0$  the left hand side is negative and since  $E > \exp\left(\frac{\underline{u}-1}{\alpha}\right)$  the right hand side is positive. Thus the ruler chooses  $L = L^*$ .

**Proof of Lemma 2.** I examine two cases.

1. First suppose  $\underline{u} \leq 1 + \alpha \log L_0$ , equivalently  $\exp(\frac{\underline{u}-1}{\alpha}) \leq L_0$ . By Lemma 1 the bad type invests only if  $E > L_0$ . Suppose  $E \leq L_0$ , so that the bad type does not invest. Then

$$(5.4) \quad U_{CI} = \underbrace{\gamma U_{max}}_{\text{good type in period 1}} + (1-\gamma) \{ 1 - \theta + \delta [ \underbrace{(1-d\gamma)\underline{u}}_{\text{bad type in period 2}} + \underbrace{d\gamma(1+\alpha \log L_0)}_{\text{good type in period 2}} ] \}.$$

(Recall that  $U_{max} \equiv 1 - \delta\alpha + L_0 + \delta[1 + \alpha \log \delta\alpha]$  is welfare from a good ruler's welfare-maximizing choice  $L = \delta\alpha - L_0$ .)

Suppose that  $E > L_0$ . Then the bad type invests  $L^* = E - L_0$ . However, this investment does not benefit the voter if the bad type remains in power, since he then recoups his investment with higher taxes, satisfying the migration constraint with equality. Thus

$$(5.5) \quad U_{CI} = \gamma U_{max} + (1-\gamma) \{ 1 - \theta + \delta [(1-d\gamma)\underline{u} + d\gamma(1+\alpha \log(E))] \}.$$

2. Next suppose  $\underline{u} > 1 + \alpha \log L_0$ , equivalently  $\exp(\frac{\underline{u}-1}{\alpha}) \geq L_0$ . By Lemma 1, the bad type now invests if and only if  $E > \exp(\frac{\underline{u}-1}{\alpha})$ . Also, if the bad type does not invest, the good type cannot satisfy the migration constraint. Thus, for  $E > \exp(\frac{\underline{u}-1}{\alpha})$ , utility is as in (5.5). Otherwise utility is

$$(5.6) \quad \gamma U_{max} + (1-\gamma)(1-\theta + \delta[(1-d\gamma)\underline{u} + d\gamma\underline{u}]) = \gamma U_{max} + (1-\gamma)(1-\theta + \delta\underline{u}).$$

Combining (5.4), (5.5) and (5.6) gives the proof.

**Proof of Lemma 3.** 1. Again, first suppose  $\underline{u} \leq 1 + \alpha \log L_0$ . Then differentiating (5.4) and (5.5), recalling that  $E = (1-d)\delta\alpha$ , gives

$$(5.7) \quad \frac{\partial}{\partial d} U_{CI} = \begin{cases} (1-\gamma)\delta\gamma(1+\alpha \log L_0 - \underline{u}) & \text{for } E \leq L_0, \\ (1-\gamma)\delta\gamma(1+\alpha \log E - \underline{u} - \frac{d\alpha}{1-d}) & \text{for } E > L_0. \end{cases}$$

For  $E \leq L_0$ , i.e. high values of  $d$  compared to  $L_0$ , an increase in internal competition is unambiguously positive: it increases the probability that a good type replaces a bad type. For  $E > L_0$ , i.e. low values of  $d$  compared to  $L_0$ , this is counterbalanced by the deterrent effect on the bad type's investment - the  $d\alpha/(1-d)$  term.

The cross-partial for any  $E \neq L_0$  is

$$(5.8) \quad \frac{\partial^2}{\partial d \partial \underline{u}} U_{CI} = -\delta\gamma(1-\gamma) < 0.$$

which proves this case. (At  $E = L_0$ , the first derivative in  $d$  is not defined, but both left and right hand derivatives exist and are themselves decreasing in  $\underline{u}$ .)

2. Next, if  $\underline{u} > 1 + \alpha \log L_0$ , then from (5.5) and (5.6)

$$(5.9) \quad \frac{\partial U_{CI}}{\partial d} = \begin{cases} 0 & \text{for } E < \exp(\frac{\underline{u}-1}{\alpha}), \\ (1-\gamma)\delta\gamma(1+\alpha \log E - \underline{u} - \frac{d\alpha}{1-d}) & \text{for } E > \exp(\frac{\underline{u}-1}{\alpha}). \end{cases}$$

The cross-partial, where it exists, is

$$(5.10) \quad \frac{\partial^2}{\partial d \partial \underline{u}} U_{CI} = \begin{cases} -\delta\gamma(1-\gamma) < 0 & \text{for } E > \exp(\frac{\underline{u}-1}{\alpha}), \\ 0 & \text{for } E < \exp(\frac{\underline{u}-1}{\alpha}) \end{cases}$$

which proves this case.

**Proof of Proposition 4.**

*Proof.* First, whenever  $E > \max\{L_0, \exp(\frac{\underline{u}-1}{\alpha})\}$ , (5.5) can be differentiated twice to give

$$(5.11) \quad \frac{\partial^2 U_{CI}}{\partial d^2} = (1-\gamma)\delta\gamma \left( -\frac{\alpha}{1-d} - \frac{\alpha}{(1-d)^2} \right) < 0$$

i.e., utility is concave in  $d$  for low  $d$ .

For  $\underline{u} > 1 + \alpha \log L_0$  (equivalently  $\exp(\frac{\underline{u}-1}{\alpha}) > L_0$ ), and for values of  $d$  approaching the crossover point  $E = \exp(\frac{\underline{u}-1}{\alpha})$  from below, the slope (5.9) evaluates to  $\frac{\partial U_{CI}}{\partial d} = (1-\gamma)\delta\gamma(-\frac{d\alpha}{1-d}) < 0$ . Also, below this point,  $U_{CI}$  is concave in  $d$  by (5.11), while above this point (5.9) shows that the slope is 0. Therefore, it must be that  $d^* \in (0, 1)$  and  $(1-d^*)\delta\alpha > \exp(\frac{\underline{u}-1}{\alpha})$ . At this interior optimum one can then use (5.10) and (5.11) to write

$$(5.12) \quad \frac{\partial d^*}{\partial \underline{u}} = -\frac{\partial^2 U_{CI} / \partial d \partial \underline{u}}{\partial^2 U_{CI} / \partial d^2} < 0.$$

When  $\underline{u} \leq 1 + \alpha \log L_0$ , and when  $d^*$  is interior, it must be that  $E > L_0$  at  $d^*$  since otherwise, by (5.7), utility would be strictly increasing in  $d$  at this point, contradicting the optimality of  $d^*$ . Again by (5.8) and (5.11) we have

$$(5.13) \quad \frac{\partial d^*}{\partial \underline{u}} = - \frac{\partial^2 U_{CI} / \partial d \partial \underline{u}}{\partial^2 U_{CI} / \partial d^2} < 0.$$

Thus small increases in  $\underline{u}$  will decrease  $d^*$ . Could it be that an increase in  $\underline{u}$  might make  $d^* = 1$  optimal? (Equivalently, if  $d^* = 1$ , could a large decrease in  $\underline{u}$  cause a jump to an interior  $d^*$ ?) I show it cannot by a simple revealed preference argument. Fix  $\underline{u} = u'$  and suppose that the optimal level of democracy for this value is  $d' \in (0, 1)$ . Fix  $u'' > u'$  and write  $d''$  for the corresponding optimal level of democracy. If  $u'' > 1 + \alpha \log L_0$  it must be that  $d''$  is interior. Otherwise, to show utility at  $d'$  continues to be higher than at  $d = 1$ , write

$$\begin{aligned} (1 - \gamma)u' + \gamma(1 + \alpha \log L_0) &\leq (1 - d'\gamma)u' + d'\gamma(1 + \alpha \log E) \\ \Rightarrow (1 - \gamma)u'' + \gamma(1 + \alpha \log L_0) &\leq (1 - d'\gamma)u'' + d'\gamma(1 + \alpha \log E) \end{aligned}$$

, since the left hand side has increased by  $(1 - \gamma)(u'' - u')$  and the right hand side has increased by  $(1 - d'\gamma)(u'' - u')$ , a larger amount. Thus  $d = 1$  cannot be optimal at  $u''$ : an increase in  $\underline{u}$  cannot cause a jump to  $d^* = 1$ . This fact, combined with (5.12) and (5.13), completes the proof of the proposition.

On the other hand, a decrease in  $\underline{u}$  may very well cause a discontinuous jump from  $d^*$  in the interior to  $d^* = 1$ . Figure 3.1 shows an example of this. Indeed, write  $d_I$  for the possible interior maximizer of (5.5) that solves  $\frac{\partial U_{CI}}{\partial d} = (1 - \gamma)\delta\gamma(1 + \alpha \log E - \underline{u} - \frac{d\alpha}{1-d}) = 0$ , and that satisfies  $E = (1 - d_I)\delta\alpha > \max\{L_0, \exp(\frac{\underline{u}-1}{\alpha})\}$ . (If there is no such maximizer then  $\underline{u}$  cannot be the site of a jump, since utility is strictly monotonically increasing for low  $d$ .) Then the points of  $\underline{u}$  around which a jump in  $d^*$  occurs are those points where utility from  $d = 1$  equals utility from  $d = d_I$ , in other words:

$$(1 - \gamma)\underline{u} + \gamma \max\{1 + \alpha \log L_0, \underline{u}\} = (1 - d_I\gamma)\underline{u} + d_I\gamma(1 + \alpha \log(1 - d_I)\delta\alpha).$$

This cannot hold when  $\underline{u} > 1 + \alpha \log L_0$ , since then the right hand side must be greater than the right hand side.  $\square$

**Proof of Lemma 5.**

*Proof.* Write the bad ruler's utility for a given investment level as  $U_{bad}$ , which maximizes

$$\begin{aligned} & \theta - L + \delta(1-d)R_2(L) \\ = & \theta - L + \delta(1-d) \begin{cases} \theta & , 1 - \theta + \alpha \log(L + L_0) \geq \underline{u} \\ 1 - \underline{u} + \alpha \log(L + L_0) & , 1 + \alpha \log(L + L_0) \geq \underline{u} > 1 - \theta + \alpha \log(L + L_0) \cdot \\ 0 & , \underline{u} > 1 + \alpha \log(L + L_0) \end{cases} \end{aligned}$$

This expression is continuous in  $L$  and by the Theorem of the Maximum,  $U_{bad}$ , which is the maximum of this w.r.t  $L$ , is also continuous. It is also straightforward that  $\frac{\partial U_{bad}}{\partial d} \leq 0$  whenever it exists, and this combined with continuity shows that  $U_{bad}$  is weakly decreasing in  $d$ .

To prove the second statement, fix  $d' > d$  and  $u' > u$ . Write  $U_{bad}(d, u)$  to emphasize the dependence on the parameters. We wish to show that  $U_{bad}(d', u') - U_{bad}(d, u') \geq U_{bad}(d', u) - U_{bad}(d, u)$ . Since  $U_{bad}$  is continuous and differentiable almost everywhere, we can write

$$(5.14) \quad U_{bad}(d', u) - U_{bad}(d, u) = \int_d^{d'} \frac{\partial U_{bad}}{\partial d}(\hat{d}, u) d\hat{d},$$

and the same for  $u'$ . So it will suffice to show that for every  $\hat{d}$  where it is defined,  $\frac{\partial U_{bad}}{\partial d}(\hat{d}, u') \geq \frac{\partial U_{bad}}{\partial d}(\hat{d}, u)$ .

By the Envelope Theorem, when the bad type's choices of  $L$  and  $\tau_2$  are interior, i.e.  $L = E - L_0$  and  $\tau_2 = 1 - \underline{u} + \alpha \log E$ , only the direct effect of democracy on his reelection chances, i.e. the marginal loss of period 2 tax revenue, need be considered:

$$(5.15) \quad \frac{\partial U_{bad}}{\partial d} = -\delta R_2(L) = -\delta(1 + \alpha \log E - \underline{u})$$



If  $L = 0$ , and if  $1 + \alpha \log L_0 \leq \underline{u}$  then the bad type receives no revenue in period 2 since citizens migrate; then  $\frac{\partial U_{bad}}{\partial d} = 0$ . If  $L = 0$  and  $1 + \alpha \log L_0 > \underline{u}$  then again  $\frac{\partial U_{bad}}{\partial d} = -\delta R_2(L) = \delta(1 + \alpha \log L_0 - \underline{u})$ . (In this case, (3.5) requires that  $R_2(L) < \theta$ .) Putting these together,

$$\frac{\partial U_{bad}}{\partial d} = \begin{cases} -\delta(1 + \alpha \log(\max\{L_0, E\}) - \underline{u}) & , E > \exp\left(\frac{\underline{u}-1}{\alpha}\right) \\ 0 & , E < \exp\left(\frac{\underline{u}-1}{\alpha}\right). \end{cases}$$

Now, fixing  $\hat{d}$  and hence  $E = (1 - \hat{d})\delta\alpha$ , and recalling  $u' > u$ , there are three cases:  $E > \exp\left(\frac{u'-1}{\alpha}\right)$ ,  $E < \exp\left(\frac{u'-1}{\alpha}\right)$  and  $\exp\left(\frac{u'-1}{\alpha}\right) < E < \exp\left(\frac{\underline{u}-1}{\alpha}\right)$ . (One or other derivative is not defined when the inequality is not strict.) In all three cases it is straightforward that  $\frac{\partial U_{bad}}{\partial d}(\hat{d}, u') \geq \frac{\partial U_{bad}}{\partial d}(\hat{d}, u)$  as required, either by differentiating  $\frac{\partial U_{bad}}{\partial d}$  with respect to  $\underline{u}$ , or by observing that  $\frac{\partial U_{bad}}{\partial d} \leq 0$  always.  $\square$

**Proof of Proposition 6.**

*Proof.* The argument that rulers will take fewer opportunities to decrease democracy is given in the text. The argument for citizens is almost the same. Write  $U_{CI}(u, d)$  to emphasize the dependence on the parameters. I show that whenever an increase in democracy would be beneficial,  $U_{CI}(\underline{u}, d)$  has decreasing differences in  $\underline{u}$  and  $d$ . Thus, for higher levels of  $\underline{u}$ , the benefit of an increase in democracy is lower, the minimum cost to make a change worthwhile increases. Fix  $u' > u$  as levels of external competition, and  $d' > d$  as levels of democracy. I wish to show that if either  $\frac{\partial U_{CI}}{\partial d}(u, d) > 0$  or  $\frac{\partial U_{CI}}{\partial d}(u', d) > 0$ , then  $\frac{\partial U_{CI}}{\partial d}(u', d) \leq \frac{\partial U_{CI}}{\partial d}(u, d)$ . This suffices, since if both slopes are negative, the citizens will never take any opportunity to increase democracy.

Putting (5.7) and (5.9) together gives.

$$(5.16) \quad \frac{\partial U_{CI}}{\partial d} = \begin{cases} 0 & \text{for } E < \exp\left(\frac{\underline{u}-1}{\alpha}\right), \\ (1 - \gamma)\delta\gamma(1 + \alpha \log E - \underline{u}) & \text{for } \exp\left(\frac{\underline{u}-1}{\alpha}\right) < E < L_0 \\ (1 - \gamma)\delta\gamma(1 + \alpha \log E - \underline{u} - \frac{d\alpha}{1-d}) & \text{for } E > L_0, E > \exp\left(\frac{\underline{u}-1}{\alpha}\right). \end{cases}$$

Fix  $d$  and hence  $E = (1 - d)\delta\alpha$ , and recall that  $u' > u$ . If  $E > L_0 > \exp\left(\frac{u'-1}{\alpha}\right)$  then the case is shown by differentiating the last line of (5.16) with respect to  $\underline{u}$ . If  $L_0 > E > \exp\left(\frac{u'-1}{\alpha}\right)$  then the case is shown by differentiating the second line of (5.16) with respect to  $\underline{u}$ . The remaining cases have  $E < \exp\left(\frac{u'-1}{\alpha}\right)$ , so that  $\frac{\partial U_{CI}}{\partial d}(u', d) = 0$ . But then either  $\frac{\partial U_{CI}}{\partial d}(u, d) < 0$  so that there is no benefit from a small increase in democracy at  $u$  or  $u'$ , or if  $\frac{\partial U_{CI}}{\partial d}(u, d) \geq 0$  then  $\frac{\partial U_{CI}}{\partial d}(u', d) \leq \frac{\partial U_{CI}}{\partial d}(u, d)$ .  $\square$

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