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CITIZENS, AUTOCRATS, AND PLOTTERS: A MODEL AND NEW EVIDENCE ON COUPS D'ÉTAT

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We present a model of coups in autocracies. Assuming that policy choices cannot be observed but are correlated with the short-run performance of the economy we find that: (a) the threat of a coup disciplines autocrats; (b) coups are more likely in recessions; (c) increasing per capita income has an ambiguous effect on the probability of a coup. The implications of the model are consistent with the evidence. On average, one recession in the previous year increases the probability of a coup attempt by 47 percent. By contrast, the effect of the level of per capita income is weak.

1. INTRODUCTION

WHEN WE think of political competition, elections, parliaments, and constitutions are the first images that spring to our minds. Since elections are thought to be the "normal" way of changing governments, the reader may wonder whether coups d'état are common and worthy of study. Consider first that coups, not elections, are the predominant way of changing governments in most developing countries. For example, in a sample of 99 non-communist less-developed countries (LDCs) spanning the period between 1950 and 1982 taken from Jodice and Taylor (1983), 88 of these 99 countries lived through at least one coup attempt, and in 66 of them governments were changed at least once by a successful coup. Many poor economies like Bolivia, Benin, and Togo have frequently lived through them, but so did relatively rich countries like Argentina, Greece, and Venezuela. And while coups are more common under autocratic rule, some of the best known occurred in well-established democracies like Chile and Uruguay in 1973. This diversity may have prompted authors like Zolberg (1968) to argue that coups are some sort of social disease that cannot be analyzed systematically. O'Kane (1981, p. 308) says that "perhaps coups are just the drastic response to an unstable and hopeless economic situation against which little can be done."

This paper presents a model of coups in autocracies and new empirical results. We model autocrats as self-interested individuals who want to stay in office to privately benefit from power. Because the economy lacks institutions that norm

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the transfer of power, the autocrat can be ousted only by a coup.[1] Coups occur when plotters perceive a reasonable chance of succeeding, which happens when there is widespread discontent with the autocrat and the majority of the population is willing to passively follow the rule of a new ruler (we discuss what this "passive willingness" exactly means in the next section). Citizens cannot observe the extent of the autocrat's opportunism, but only the state of the economy. Thus, the level of discontent depends on economic performance; it rises when a recession hits.

We find that to some extent the threat of a coup moderates the autocrat's self-interest, but only if by doing so he can increase the probability of remaining in office.[2] Then he optimally trades off the benefit of pursuing his self-interest today with the increased chance of a bad short-run economic performance, and coups occur only when a recession hits. By contrast, and contrary to the conventional wisdom in the literature, we find that increasing the level of income has an ambiguous effect on the probability of a coup.

The model's results are consistent with the empirical evidence we present. In a panel of 89 non-communist developing countries spanning the period 1950–1982, we find a sizable effect of recessions and an indicator of popular unrest on the probability of a coup. One recession in the previous year increases the probability of a coup attempt by 47 percent. By contrast, while countries with higher per capita GDP face a lower probability of a coup attempt, the effect of increasing income is much smaller when compared with the effect of recessions and popular unrest. Additionally, like Londregan and Poole (1990, 1992) we find a "coup trap," i.e. coups in the recent past increase the probability of a coup today.

Before proceeding, we call attention to a caveat. There is a vast theoretical and empirical literature on political violence by sociologists and political scientists that we do not discuss here. In Galetovic and Sanhueza (1995) we survey this literature.[3] Nevertheless, in the literature coups are often confused with other forms of political violence (e.g., revolution, riots or civil wars). For this reason, in section 2 we briefly define what we mean by "coup" and relate our work with the economic literature on political violence. In section 3 we present the model, which is solved in section 4. In section 5 we present an agency extension of the basic model. Section 6 presents the estimation strategy and data. In section 7 we discuss the empirical results. Section 8 concludes.

2. COUPS D'ÉTAT: DEFINITION, ISSUES, AND RELATION WITH THE LITERATURE

O'Kane (1987, pp. 22, 37) defines coups as attempts to overthrow a government that are: (i) illegal; (ii) carried out by a small group based within the state

[1] In some cases autocrats call elections and transfer power, but this happens only exceptionally and usually to avoid being ousted by a coup. On autocrats calling to elections see Tullock (1987, p. 188).

[2] This finding is consistent with Frohlich et al.'s (1970) argument that an expected utility maximizer leader will trade off security for profits.

[3] See also Sanhueza (1995).

apparatus; (iii) speedily effected; and (iv) involve the threat or actual use of violence (see also Luttwack, 1968, p. 27). This definition stresses the distinctive features of coups. First, the masses do not participate directly in their execution – coups are the business of an elite. Second, coups are swift events: most of the time, either plotters succeed in taking control within 24 to 48 hours, or the coup attempt fails. Third, although some coups are bloody, many times the threat of force is enough to overthrow the incumbent. For this reason, the direct participation of the military is often not necessary, and coups staged and carried out by civilians are not uncommon. For example, O'Kane (1987, pp. 9, 10) stresses that only one government in six set up after a successful coup is composed exclusively by military officers. Most are a mixture of military officers and civilians.

The elite nature of coups distinguishes them from other forms of political violence like revolutions, riots, or civil wars. Yet while the masses do not directly participate in the execution of a coup, it would be a mistake to ignore them. Clearly a necessary condition for success is to physically displace and isolate the incumbent ruler – cut his communication with the rest of the state apparatus. But the actual seizure of power occurs only after commands issued by the plotter are voluntarily obeyed by most of the bureaucracy and the population, for their generalized disobedience would make it impossible to take over the state. For this reason coups tend to occur when there is widespread discontent with the incumbent, because only then the citizenry will remain passive and voluntarily obey the new ruler's commands as soon as he shows a firm grip on the reins of executive power.[4] It could be argued that the citizenry is irrelevant all the same, because most individuals would obey if physically coerced; thus the support of the military would be a sufficient condition to stage a successful coup. But this argument overlooks two constraints that any plotter must obey if she wants to use repression to force the bureaucracy and the population to obey. First, there are many more citizens than soldiers, so that it is not feasible to simultaneously repress a large number of individuals. Second, orders to massively repress not only have to be issued by officers who support the plotter, but also obeyed by the troops they command. It may not be very difficult to find a small group willing to engage in selective brutal repression, but massive brutal repression is a different matter, because it must be carried out openly by most of the military. In that case officers and troops must shoot against their fellow citizens, and many of them will not be willing to do that. Thus, it is more likely that officers will

[4] Our argument is similar to Luttwak's (1968, ch. 3), who points out that one of the preconditions for a coup attempt to be successful is that the citizenry does not react against the plotter. Nevertheless, while Luttwak suggests that apathy on the part of the population is to be expected mainly from the masses of very poor and backward countries who lack a general understanding of the basis of political life of the sort commonly found in the masses of developed societies (see p. 37), our argument points out that people will remain passive not only when they are poor and illiterate, but also when they are not happy with the incumbent autocrat.

support a coup if they expect the population to voluntarily obey the commands of the plotter.[5]

Now in many developing countries coups recur and are the principal means whereby rulers are changed. One of the main characteristics of countries that are prone to coups is that institutions fail to effectively regulate political competition. Some of the questions that emerge are: Why are coups the main means of political competition in some countries? Under which political, economic, and institutional circumstances do coups occur? Do democracies experience fewer coups than autocracies? Are the determinants of coups different in democracies than in autocracies? Why are some autocracies less prone to coups than others?

In this paper we analyze some of these issues. We restrict the formal analysis to autocracies, where coups are the main means of political competition and power transfer. Our approach shares with the economic literature on political violence its stress on private costs and rewards to explain political action. As in the works of Chaffee (1992), Grossman (1991, 1994), Grossman and Noh (1990), Kimenyi (1989), and Tullock (1971, 1974, 1987), the main motivation to control the government is to benefit from it. As regards coups, however, our model goes beyond this literature by explicitly considering that they are carried out by small organized groups who take advantage of popular discontent but where the role of the citizenry is indirect.

In addition, in an extension of the basic model we study the conflict of interest between the autocrat and the citizenry as a principal–agent problem; by privately benefiting from holding power the autocrat chooses policies that reduce the welfare of the citizenry. In that extension, the citizenry's actions are neither motivated by the prospect of appropriating part of the rents that accrue from controlling the government, as is common to most of the literature, nor by the desire to change the distribution of wealth, as in Hirshleifer (1988), Roemer (1985) or Zablotsky (1992). Rather, the citizenry behaves as if it would have the intention of inducing the incumbent to follow policies that are closer to its preferences. In this way the model can be related to political models of macroeconomic policy in democracies that study how elections discipline incumbents [see Alesina (1992) and Persson and Tabellini (1990) for surveys].

3. THE BASIC MODEL

We study a two-period economy with three agents: an autocrat, who rules in the first period; a plotter, who may stage a coup to become ruler in the second period; and the citizenry. By "autocrat" we mean an incumbent who governs without

[5] Both constraints are no longer binding after the plotter succeeds in being obeyed, for then selective repression is usually enough to scare the large majority of the population, and to handle those bold enough to openly oppose the new autocrat. But this is not so *before* the plotter has secured power during the 24 to 48 hours after the coup attempt starts. Then compliance with the commands of the plotter is still a matter of choice for most individuals, and it matters whether the plotter expects that the majority of the people will obey him.

being subject to constitutional checks. By "plotter" we have in mind a small group of military officers, civilians, or both, who stage a coup when conditions are favorable. By "citizenry" we mean the country's bureaucracy and common citizens. Both the autocrat and the plotter are risk-neutral expected utility maximizers.

To model the relation between the autocrat's opportunism and economic performance as directly as possible we make the following assumptions: (a) in the first period per capita output, which we denote by y, can be either normal (y_N) or low ($y_L = \beta y_N$, $0 < \beta < 1$); (b) the autocrat directly chooses the probability that output is low, s; and (c) the autocrat's utility is increasing in the probability of low output according to the strictly concave function $As^{1-(1/\sigma)}$, with $A \equiv (\sigma/\sigma - 1)$ and $\sigma \in (1, \infty)$. A large probability of output being low is associated with an opportunistic economic policy that seeks to benefit the autocrat.[6] The key assumption here is that this opportunistic policy affects not only the expected value of output but also the probability that the short-run performance of the economy will be bad, i.e. that there will be a recession.[7] Of course, in practice recessions can happen for reasons beyond the control of the autocrat. All we need here is that an opportunistic policy increases the probability that recession happens, not necessarily that it determines it. Last, because autocrats are not accountable and can easily conceal information on their actions, we assume that the citizenry cannot observe s.

The autocrat would like to be in power in period 2, to appropriate a rent worth V in present value. He is aware that the probability of staying in power, p, depends on the realization of output in period 1 (we endogenize p below). Thus, his problem is to choose s to maximize

$$[(1 - s)p_N + sp_L]V + As^{1-(1/\sigma)}; \tag{1}$$

p_N and p_L are the probabilities of staying in power if output is, respectively, normal and low.

The plotter would like to rule in period 2 to appropriate the rent V, but to seize power she must stage a successful coup at the end of period 1. It costs nothing to stage a coup, but if the attempt fails, the plotter is punished, which has disutility F. The plotter may attempt a coup, and her decision depends on the probability of success. Following the discussion in section 2 we assume that this probability is determined by the willingness of the citizenry to passively accept the commands of a new autocrat and is equal to w, an index of this willingness. Thus, the expected utility of the plotter is

[6] One possible means whereby an autocrat can profit from being in office is by stealing tax revenues or state assets (hence the notation s). But opportunism encompasses other types of corrupt practices as well. As Brough and Kimenyi (1986) and Kimenyi (1987) stress, dictators tend to adopt inefficient policies to make sure that they remain in power. Moreover, to pursue their self-interest autocrats need to adopt discretionary policies that will probably increase economic instability and output volatility.

[7] More generally, if one defines a recession to be a year in which output falls (as we do in the empirical section below) policies that reduce the average rate of growth of the economy will also increase the probability that a recession occurs even if these policies leave the standard deviation of the growth rate unchanged.

$$\max\{0,\ wV - (1-w)F\}. \tag{2}$$

That is, if the expected utility of a coup attempt is negative, the plotter does not stage a coup. It remains to describe the citizenry. We assume that its behavior is determined by a map $\mathbf{w}$: $\{y_L, y_N\} \to [0, 1]$, which summarizes the relation between short-run economic performance and the willingness to passively follow the commands of a new ruler, such that

$$w = \begin{cases} 0 & \text{if } y = y_N \\ w_L > 0 & \text{if } y = y_L. \end{cases} \tag{3}$$

That is, the citizenry is willing to accept a new ruler only when there is a recession and economic performance is bad.[8] This map is common knowledge. Note that the citizenry's behavior cannot be conditioned on the autocrat's action s because it is not observable.

The function (3) is consistent with the common observation in the political and sociological literature that discontent rises when the performance of the economy is bad [see e.g. Eckstein (1964–65), Gurr (1970)].[9] Nevertheless, (3) is also plausible, because the actions summarized in $\mathbf{w}$ are probably costly for the citizenry, since the main way whereby a plotter learns about discontent with the autocrat and the willingness to accept her as a new ruler is through expressions of discontent. Individuals risk harsh punishments when they protest against an autocrat, or engage in actions that might imperil his rule. Thus one would expect that citizens will economize on it. If citizens like good economic performance (and therefore policies that make good economic performance more likely) it seems plausible that they will engage in demonstrations only when economic performance is bad. In section 5 we show that under some assumptions (3) is collectively optimal and can be derived from the maximization of well-defined aggregate preferences.

By directly modelling the aggregate behavior of the citizenry we are ignoring the questions of why some people are willing to bear the costs of discontent given that they could free ride, and why actions that are individually irrelevant affect, when aggregated, the probability of success of a coup attempt; this is another example of Olson's (1965) classic collective action problem.[10] Our aim in this paper is to study the determinants of coups, not the collective action issue

[8] In this paper we have assumed that the decisions of the autocrat affect the probability distribution of output, but in general these decisions may be related to other aspects of public policy that may prompt citizens to express discontent (e.g., ideology, civil liberties, repression).

[9] Of course, there are a number of additional reasons why the citizenry may show discontent that are unrelated with the short-run performance of the economy, such as corruption scandals, human rights violations or ideological disagreements. One could think of opportunism in any of these dimensions and model them in a similar fashion as we do here with output.

[10] This problem is also present in politico-economic models of democracies where citizens express their discontent through voting. In those models the aggregation mechanism is obvious – the election is won by the most voted candidate. Nevertheless, as is well known, it is not easy to explain why people vote in the first place, given that the probability of affecting the outcome of the election is nil.

implicit in the argument that the citizenry plays a role in coups. Following Roemer (1985) we take it as a fact that people show discontent against autocrats.

To close this section, we restate the timing of actions. First, knowing **w** the autocrat chooses s. Second, after the realization of output, the citizenry's discontent w is determined according to map **w**. Last, after observing w the plotter decides whether to stage a coup.

4. SOLUTION OF THE MODEL

We solve the model backwards. First we study the problem of the plotter and endogenize the probability of remaining in office, p, as a function of w. Next we solve the autocrat's problem. Finally, we characterize the equilibrium.

Whatever the realization of output, the plotter will attempt a coup only if $w \geqslant F/(V+F) \equiv w_c$. It follows that the probability that the autocrat stays in power is

$$p = \begin{cases} 1-w & \text{if } w \geqslant w_c \\ 1 & \text{otherwise.} \end{cases} \tag{4}$$

It can be seen from equation (4) that the probability that the autocrat remains in power at the end of period 1, conditional on the realization of output, depends only on w. Because the autocrat's policy choice is not observable, w cannot depend on s; moreover, because the map **w** is exogenous and common knowledge, the autocrat knows w_L and w_N when he chooses s, thus takes p_N and p_L as given. Therefore, the autocrat's problem is to choose s to maximize (1) subject to $s \in [0, 1]$. Define $\Delta p \equiv p_N - p_L$, the increase of the probability of remaining in office when output is normal. We summarize the solution to this problem in:[11]

Proposition 1. If $1 \geqslant \Delta p V$, $s = 1$; otherwise $1 > s = [\Delta p V]^{-\sigma} > 0$.

Proposition 1 says that the autocrat trades-off the benefit of pursuing his self-interest today with the likelihood of being around tomorrow to enjoy the rents of power. As can be seen from the first part of Proposition 1 no tradeoff exists if $\Delta p < 0$: the autocrat can avoid the state in which he is punished with larger probability just by pursuing his self-interest today, thus he selects $s = 1$. By contrast, when the chances of remaining in power are better when output is normal, and the rewards of staying in power, V, are large enough, the autocrat restrains himself today to reduce the probability that a recession occurs. When $s < 1$ is optimal, the probability of low output is decreasing in V: the more valuable the future relative to the present, the more the autocrat restrains himself today.

The result that the fear of losing office disciplines the autocrat is not new. For example, it appears in Grossman's (1991) model of insurrections, and in

[11] All proofs are in Appendix 1.

Grossman and Noh's (1990) theory of kleptocracy. On the other hand, as Olson (1993) argues, a larger probability of losing office may reduce the expected present value of the rents of remaining in power, thereby prompting the incumbent to abscond more, not less.[12] Proposition 1 suggests that which result applies depends on whether the autocrat's decisions are observable. In models where decisions are observable, the behavior of the citizenry will be based on the autocrat's actual decisions, and the probability of survival will be larger when his policy decisions make a good economic performance more likely. By contrast, when policy choices cannot be observed, the autocrat is disciplined only if the probability of survival depends on observable signals whose probability distribution is affected by policy choices. As the present model suggests, in those cases it is not quite correct to say that the fear of being ousted by a coup (i.e., that p_L or p_N are less than one) disciplines the autocrat, for, as can be seen from the first part of Proposition 1, when $\Delta p = 0$ the autocrat chooses $s = 1$ regardless of how small p is. Autocrats are disciplined only if $\Delta p > 0$. When policy choices cannot be observed and no signals are available, then Olson's conjecture probably applies, and the threat of a coup no longer disciplines autocrats; on the contrary, it may prompt them to act even more opportunistically.[13]

Now from the map **w** in (3) and the plotter's decision rule, it follows that $\Delta p = 0$ when $w_L < w_c$ and $\Delta p = w_L$ when $w_L \geqslant w_c$. Then, Proposition 2 follows:

Proposition 2. (a) Let $w_L < w_c$ or $w_L V \leqslant 1$. Then (i) coup attempts do not occur; (ii) recessions occur with probability 1.

(b) Let $w_L \geqslant w_c$ and $w_L V > 1$. Then (i) the unconditional probability that a recession and a coup attempt occur is $s = (V w_L)^{-\sigma}$; (ii) the unconditional probability that a successful coup occurs is $1/V^{\sigma} w_L^{\sigma-1}$. Thus, the larger w_L the smaller s. (iii) Coups occur only when there is a recession.

Proposition 2 says that if the rewards of staying in power, V, are large enough, then discontent when there is a recession disciplines the autocrat. Moreover, coup attempts occur when discontent is high and there is a recession. In section 7 we test these implications empirically.

5. AN AGENCY EXTENSION OF THE BASIC MODEL

It is by now common in the literature to think of governments as agents of the citizenry. This approach highlights the conflict of interest that exists between the citizenry, who wants the state to be efficiently run according to its tastes, and government officials, who may want to use their public office for private gain. In this section we show that the map **w** assumed in (3) can be derived assuming that

[12] See also McGuire and Olson (1996).

[13] In their model Grossman and Noh (1990) also obtain the result that a smaller probability of remaining in office may increase the incumbent's opportunism when he cannot precommit future policy choices.

the citizenry chooses **w** optimally to discipline the autocrat and make him choose policies that make a good economic performance more likely.[14]

Assume that the citizenry behaves as if it were a single agent. At the beginning of period 1, and before the autocrat chooses s, it commits map **w**: $\{y_L, y_N\} \to [0, 1]$ to maximize

$$(1 - s)(1 - w_N^{\gamma})y_N + s(1 - w_L^{\gamma})y_L, \tag{5}$$

with $\gamma > 1$, where w_N and w_L are respectively the actions taken by the citizenry when output is respectively normal and low. Thus, the citizenry likes output but, for the reasons discussed in section 3, showing discontent is costly. This cost is modelled assuming that it reduces the utility derived from a given level of output, and does so at an increasing rate (thus $\gamma > 1$). The citizenry chooses **w** to maximize its objective function (5), taking (4) and the autocrat's decision rule as given. It must optimize because expressions of discontent are costly.

We first note that in this setting the citizenry never supports a coup attempt when output is normal, thus $w_N = 0$. To see why, note that the optimal decision rule of the autocrat says that s is decreasing in Δp. Thus, it can be seen from equation (4) that it is optimal for the citizenry to reward the autocrat when output is normal, selecting $w_N < w_c$, so that $p_N = 1$. But since the citizenry's payoff is decreasing in w_N, it is optimal to choose $w_N = 0$.

Now in this setting the citizenry may precommit to show discontent when output is low to discipline the autocrat. However, as can be deduced from Proposition 1, a necessary condition for this to happen is that the autocrat sufficiently values the future, that is, V cannot be too small; otherwise it would never pay for the citizenry to show any discontent, because the autocrat would choose $s = 1$ anyway. Moreover, the citizenry may always do nothing. Thus, it precommits to show some discontent only if by doing so the probability of normal output increases enough to compensate for the cost of discontent. To ensure this we assume:

Assumption 1. (i) $1 < w_c V$; (ii) $(1 - s(w_c))y_N + s(w_c)(1 - w_c^{\gamma})y_L \geqslant y_L$; (iii) $\gamma > \sigma$,

where $s(w_c)$ is the optimal decision of the autocrat when $w_N = 0$ and $w_L = w_c$. In view of Proposition 1, part (i) ensures that the threat that there will be a coup when output is low always disciplines the autocrat at least a bit. Part (ii) ensures that the citizenry is always better off showing enough discontent to trigger a coup when there is a recession. Part (iii) is a necessary technical condition for the citizenry ever to be willing to select $w > 0$. Proposition 3 summarizes the citizenry's optimal decision.

[14] It has been suggested to us that an autocrat is not the agent of the citizenry, because the citizenry does not elect him. Nevertheless, the key characteristic of an agency relation is the conflict of interest between the principal and the agent, regardless of whether the principal chooses his agent. For example, in some health insurance plans the insured cannot choose her physician. Nevertheless, it is clear that the assigned physician is the agent of the insured.

Proposition 3. Let $q \equiv [\sigma(1-\beta)]/[(\gamma-\sigma)\beta]$ and let Assumption 1 hold. Then (i) $w_L = 1$ if $q \geqslant 1$; (ii) $w_L = q^{1/\gamma}$, if $1 > q > w_c^{\gamma}$; (iii) $w_L = w_c$, if $q \leqslant w_c^{\gamma}$.

As can be seen from Proposition 3, the more severe a recession [the smaller β and the larger $(1-\beta)$], the larger w_L. Thus, when recessions are more severe the citizenry accepts a new ruler more willingly. Moreover, w_L does not vary with expected per capita income. Increasing the level of output equiproportionally in both states has two opposing effects: on the one hand it increases the cost of a recession, because for a given relative output gap $(1-\beta)$, the absolute output loss is larger in richer economies; on that account w_L should be increasing in per capita income. On the other hand, in richer economies the opportunity cost of showing discontent is larger in absolute terms, and thus w_L should be decreasing in per capita income. For the functional form chosen here both effects cancel out exactly, and w_L is independent of per capita income. More generally, while the level of economic development may affect the costs and benefits of undertaking various activities that parametrically affect the equilibrium level of w_L, our model suggests that it is unlikely that the support of the citizenry will depend on it.

The derivation of the map **w** from well-defined preferences highlights the relation between this model and the literature on macroeconomic performance and electoral outcomes.[15] In multiperiod voting models a bad outcome signals either that the incumbent is incompetent, or that his preferences differ from those of the citizenry, and thus that his future performance will be bad; this disciplines incumbents. Thus rational voters, who care only about the future, vote incumbents with bad performance out of office. Similarly, in this model the citizenry can condition its behavior on the state of the economy, affect the probability that a coup succeeds, and discipline the autocrat.[16]

6. TAKING THE MODEL TO DATA

Our model suggests that there will be a coup attempt whenever $w \geqslant w_c$. We assumed that the actions of the citizenry directly determine the probability of success of a coup; in practice, it is a function $w = \zeta(W)$, where W is the actual variable determined by the citizenry's behavior that indexes the willingness to voluntarily obey a new ruler. Then, assuming that ζ is strictly increasing, $w \geqslant w_c$ if and only if $W \geqslant W_c$. For estimation purposes, one must consider that neither W nor W_c is directly observable. It is hard to find proxies for W_c and at most one can conjecture that it will vary across countries and time according to a density,

[15] See, for example, Alesina (1992) and Persson and Tabellini (1990).

[16] Our model is one shot. But in a multiperiod model of coups, and ignoring Olson's collective action problem, it would be rational to oppose an autocrat if people believe that ousting the incumbent will improve future performance. Because in this model the citizenry's payoff depends only on actions chosen in period 1, she cannot be forward-looking. By assuming that she can precommit we get results similar to those from multiperiod models, without solving an intertemporal problem. On this point, see the discussion in O'Flaherty (1990, pp. 150–151).

say, $g(W_c)$. One would also think that W varies across countries and time; but in this case it is possible to find observable variables that are plausibly correlated with it. For the purposes of this estimation, we assume that the unobservable variable W linearly depends on a vector $\mathbf{x}$ of observable variables, and on a disturbance term ε that captures whatever cannot be observed, so that $W = \mathbf{b}'\mathbf{x} + \varepsilon$.[17]

In a given country and year a coup attempt will occur only if $W \geqslant W_c$. Thus, the probability that a coup attempt occurs is equal to $\Pr(W \geqslant W_c) = \Pr(\mathbf{b}'\mathbf{x} + \varepsilon \geqslant W_c)$. Define $\mu \equiv \varepsilon - W_c$. Then, $\Pr(W \geqslant W_c) = \Pr(\mu \geqslant -\mathbf{b}'\mathbf{x})$. Assuming that μ is normally distributed with zero mean and unit variance, then this probability can be modelled with a standard probit. It follows that $\Pr(\mu \geqslant -\mathbf{b}'\mathbf{x}) = \Pr(\mu < \mathbf{b}'\mathbf{x}) = \Phi(\mathbf{b}'\mathbf{x})$, where Φ is the cumulative standard normal distribution; $\mathbf{b}'$ can be estimated using maximum likelihood.

We cannot directly test the implications summarized in Proposition 2 because no proxies are available for an incumbent's unobservable decisions. Nevertheless, two implications of the model can be tested with available data: (i) coup attempts occur when the citizenry is willing to obey a new ruler; (ii) they are more likely when a recession hits. Thus, in our regressions we include an indicator of open demonstrations of popular discontent, and a recession indicator. Our hypothesis is that both a recession and demonstrations of discontent increase the probability of observing a coup. Now in our model the recession indicator is a perfect proxy for W, as $w \geqslant w_c$ if and only if a recession occurs. Nevertheless, as we said before, we think that it is adequate to include both variables because there are other sources of discontent that affect the willingness of the citizenry to obey a new ruler which are unconnected with economic performance.

Our data set includes 89 non-communist developing countries and spans the period 1950–1982.[18] We leave out both developed and communist countries because in them institutions regulate political competition to a degree of effectiveness which were foreign to most non-communist developing countries during the period considered here. As we mentioned in section 2, we think that one of the main characteristics of countries which are prone to coups is that existing institutions fail to effectively regulate political competition. Our units of observation are country-years, and we have 2,243 data points in our panel. Many countries became independent after 1950; this is the main reason why our panel is unbalanced. We now describe the variables included in $\mathbf{x}$ (descriptive statistics are reported in Table 1).

The incidence of coups. The dependent variable is the annual probability of a coup attempt. With information contained in Jodice and Taylor's (1983) *World Handbook of Political and Social Indicators III* we create an index variable for each country-year taking the value of zero if no coup attempt occurred during

[17] Note that this framework would also fit an extension of our model where w_c is known by the citizenry only probabilistically.

[18] Countries are listed in Appendix 2.

TABLE 1

Continuous variables	Mean	Standard deviation	Minimum value	Maximum value
(a) Descriptive statistics (whole sample)				
GDP	1,829	1,566	212	11,675
Growth	2.36	6.57	−34.89	38.99
Past coups	0.87	1.59	0	14
Popular unrest	10.75	31.59	0	590
Categorical variables	% of obs. with value = 1			
Coup attempts	12.48			
Recession	31.00			
S. America	15.65			
Africa	43.51			
Asia	24.56			
(b) Descriptive statistics (autocracies)				
GDP	1,483	1,188	236	8,211
Growth	2.31	6.90	−34.89	38.99
Past coups	0.567	0.495	0	1
Popular unrest	5.81	13.29	0	194
Categorical variables	% of obs. with value = 1			
Coup attempts	14.85			
Recession	32.00			
S. America	12.07			
Africa	50.91			
Asia	20.81			
(c) Descriptive statistics (democracies)				
GDP	2,433	1,755	226	8,174
Growth	2.84	5.09	−13.41	28.09
Past coups	0.567	1.43	0	14
Popular unrest	22.10	57.1	0	590
Categorical variables	% of obs. with value = 1			
Coup attempts	8.56			
Recession	25.90			
S. America	22.50			
Africa	23.50			
Asia	40.40			

that year and one otherwise. In the sample 12.5 percent of country-years register coup attempts.[19]

The measure of economic performance. Our model suggests that the citizenry is willing to obey a new ruler when the short-run performance of the economy is bad. Using Summers and Heston's (1991) *Penn World Tables* (Mark V) we

[19] Jodice and Taylor (1983) define two variables: (i) an "unsuccessful irregular power transfer" which is a failed attempt by an organized group to remove and replace the incumbent national executive outside the conventional procedures for transferring formal power; (ii) an "irregular power transfer," a transfer of executive power from one leader or ruling group to another accomplished outside the conventional legal or customary procedures for transferring power in effect at the time of the event and accompanied by actual or directly threatened violence.

construct a recession indicator, a dummy variable taking the value of one if the rate of growth of per capita GDP is negative and zero otherwise. To prevent direct reverse causality we lag the recession indicator one period.[20]

The measure of popular unrest. We construct a measure of open demonstrations of popular discontent by adding the total number of political strikes, protest demonstrations, and riots during the current and the preceding year reported in Jodice and Taylor (1983). The average value of this index is close to 11 with the standard deviation close to 32.

The measure of economic development. By construction in our model the average level of GDP does not affect the likelihood of a coup attempt. Nevertheless, most authors cite underdevelopment as one of the main causes of coups. For this reason, we include per capita levels of GDP taken from Summers and Heston (1991). Average per capita GDP in our sample is \$1,805 of 1985, with standard deviation of \$1,541. It ranges from \$212 for Burma in 1951 to \$11,675 for Trinidad and Tobago in 1982.

The coup trap. Several studies suggest that countries that have lived through a coup in the recent past are more likely to experience one today, a phenomenon that Londregan and Poole (1990, 1992) called "the coup trap." We control for the coup trap with an index variable measuring the number of coup attempts in the preceding five years.[21]

Regional dummies. Londregan and Poole (1990, 1992) find that in South American countries there is a higher probability of government being changed by a coup. We control for regional effects for South America, Africa, and Asia with dummy variables.

7. ESTIMATION AND RESULTS

With the data described in the previous section we estimate the following equation:

$$\begin{aligned}\Pr(\text{coup attempt}) = \Phi\Big[&\alpha + \beta \times \text{recession} + \gamma \times \text{popular unrest} \\ &+ \delta \times \text{per capita GDP} + \theta \times \text{past coups} \\ &+ \sum_{j=1}^{3} \eta_j \times \text{region}\Big],\end{aligned} \tag{6}$$

[20] One could also use the per capita GDP growth rate as an indicator of economic performance. Nevertheless, yearly growth rates are measured quite imprecisely in Summers and Heston's data set.

[21] The lag structure was determined by running distributed lag models of successive order. We consistently found that the current probability of a coup attempt was significantly correlated with the number of coup attempts up to the preceding five years. When our distributed lag model was of order 10, we also found that the number of coup attempts that occurred 10 years ago was also significantly correlated with the present probability of a coup attempt. We performed a likelihood ratio test of the null hypothesis that the parameter associated with the number of coups occurred beyond five years past were equal to zero and could not reject it. Therefore, we include in our coup trap variable only the number of coups that occurred during the preceding five years.

where Φ is the standard normal p.d.f., and the sub-index j denotes the region (South America, Africa, and Asia). Results are reported in Table 2.[22] Since the coefficients in a probit regression are not directly interpretable, we consider a benchmark country which has not experienced a recession in the previous year and where the rest of the covariates take the sample mean values. In this benchmark country the annual probability of a coup attempt is 0.0919. We then examine the effect of varying the variables of interest one at a time and compute the change in the probability of a coup attempt.

Consider first the effect of our variables of direct interest, recessions, and popular unrest. A recession in the previous year increases the probability of a coup attempt to 0.1351 with respect to a year which does not follow a recession, i.e. by 47 percent.[23] An increase of one standard deviation in the measure of popular unrest increases that probability to 0.1075, i.e. by 17 percent. When popular discontent follows a recession, the probability rises by 69 percent to 0.1555.

Next, like Londregan and Poole (1990, 1992), we find a large effect of past coups on the probability of a coup attempt.[24] Increasing by one the number of coups in the last five years increases the probability of a coup attempt by 44 percent to 0.1323. There definitely seems to be something particular to South America, for being in that continent raises the probability of a coup attempt in a given year by 52 percent, from 0.0858 to 0.1302.

It is interesting to contrast the size of these changes with the effect of economic development. The probability of a coup attempt in a country like our benchmark but with half its per capita GDP ($915 instead of $1,829) is 0.1122, i.e. 22 percent higher. This is not a negligible effect, but it pales by comparison with the fact that a single recession or a single coup attempt in the last five years achieves at least twice this effect. This suggests that, contrary to the conventional wisdom, the level of development is not the most important determinant of the likelihood of coups. To get another feel of the relative importance of development consider that doubling per capita GDP of our benchmark economy to $3,658 decreases the probability of a coup to 0.0597. The sample average growth rate in per capita GDP is 2.36 percent, so that such a change would take 29 years. Now while coups would be less frequent in the richer economy, they would continue to happen fairly often nonetheless. Only to get an idea of the orders of magnitude involved, assume that coups in each year are independent events (this assumption is not that implausible, as we controlled for the possible autocorrelation by including past coups in our regression). The

[22] We also estimated our model using the probability of a *successful* coup as the dependent variable; results were similar to those reported here.

[23] We also estimated the model using the growth rate of per capita GDP as a measure of performance. The coefficient turned out to be negative (i.e., faster growth in the previous year decreases the probability of a coup attempt in the current year) but statistically insignificant at the 10 percent level.

[24] It should be noted that Londregan and Poole took the probability of a successful coup as their dependent variable.

probability that at least one coup attempt occurs in any given five-year period in the poorer economy is 0.38; it is 0.26 in the richer one. When one considers a 10-year period the probabilities are, respectively, 0.61 and 0.45; and in a 32-year period (the length of our sample period) the respective probabilities are 0.95 and 0.86. This is consistent with Sanhueza's (1999) finding that richer autocracies do not collapse with higher probability than less developed ones.

Our model assumes that the regime in power is an autocracy, while our sample contains country-years which were to some extent democracies. To identify those country-years that were autocracies in our sample we used Clague et al.'s (1994) classification of political regimes in developing countries. They distinguished five types of regimes: dictatorships, almost dictatorships, an intermediate category, almost democracies, and democracies. We call a country "autocratic" in a given year if Clague et al. classify it as "dictatorship" or "almost dictatorship" in the previous year (this we do to avoid direct reverse causality, as democracies who experience a successful coup often turn into autocracies). Similarly, we call a country "democratic" in a given year if Clague et al. classify it as a "democracy" or an "almost democracy" in the previous year. Almost 56 percent of the country-years are autocracies, 22 percent democracies. Then we estimated the following equation:

$$\begin{aligned}\Pr(\text{coup attempt}) = \Phi\Bigg[\alpha &+ \sum_{i=1}^{3}\beta_i(\text{recession} \times \text{regime}) \\ &+ \gamma_i(\text{popular unrest} \times \text{regime}) \\ &+ \sum_{i=1}^{3}\delta_i(\text{per capita GDP} \times \text{regime}) \\ &+ \theta_i(\text{past coups} \times \text{regime}) + \sum_{j=1}^{3}\eta_j\ \text{region}\Bigg], \qquad (7)\end{aligned}$$

where the sub-index i denotes the regime type (autocracy, intermediate, and democracy), and "regime" a dummy variable, one for each regime. Thus we estimate separate effects for autocratic, intermediate, and democratic regimes.

Columns 2 and 3 in Table 2 report the estimation of equation (7) (we do not report the coefficients for the intermediate category of regimes). Compared with equation (6), the effect of recessions and popular unrest on the probability of a coup attempt in autocracies is even stronger. In the benchmark autocracy the probability of a coup attempt is 0.0931. A recession increases the probability of a coup attempt by 51 percent to 0.1410, and an increase in the index of the popular unrest of one standard deviation raises it by 28 percent to 0.1293.

It is interesting to see what we obtain for democratic regimes. The results reported in column 3 in Table 2 say that the annual probability of a coup attempt in the benchmark democracy is 0.0751, somewhat smaller than in an autocracy. Moreover, in a democracy the effect of our popular unrest indicator on the probability of a coup vanishes; the estimated coefficient is very small and

TABLE 2 ESTIMATION RESULTS
Dependent variable: annual probability of a coup attempt

Model	Whole sample	Autocracies	Democracies
Constant	−1.2560	−1.2555	
	(0.000)	(0.000)	
	[0.119]	[0.114]	
Recession	0.2264	0.2459	0.2295
	(0.002)	(0.007)	(0.187)
	[0.076]	[0.092]	[0.174]
Popular unrest	0.2825	1.4493	0.0102
	(0.002)	(0.000)	(0.943)
	[0.093]	[0.294]	[0.144]
GDP per capita	−1.2459	−1.5892	−2.0192
	(0.000)	(0.000)	(0.000)
	[0.323]	[0.433]	[0.512]
Past coup attempts	0.2136	0.1962	0.2235
	(0.000)	(0.000)	(0.000)
	[0.019]	[0.024]	[0.048]
South America	0.2410	0.3664	
	(0.057)	(0.005)	
	[0.126]	[0.131]	
Africa	−0.1722	−0.1078	
	(0.134)	(0.347)	
	[0.115]	[0.114]	
Asia	−0.0978	−0.0457	
	(0.420)	(0.710)	
	[0.121]	[0.123]	
Chi-square	189.0	215.3	
N		2,243	

p-Values in parentheses. Standard errors in square brackets.

its standard error very large. The effect of a recession is still large, and in fact, one cannot reject the null hypothesis that $\beta_{dem} = \beta_{aut}$ at standard confidence levels, even though the sample is quite large. Nevertheless, the coefficient is estimated with a considerably larger standard error, and in a one-tailed test one cannot reject the null hypothesis that the coefficient of recessions in democracies is different from zero at the 9 percent confidence level. These results suggest mildly that democracies may be more resistant to coups in the face of a recession or of massive discontent, which is consistent with Sanhueza's (1999) finding that popular unrest has an important destabilizing effect on autocracies but not on democracies.

8. CONCLUSION

Let us summarize what we have done and found. We made two key

assumptions: first, the more the autocrat pursues his self-interest, the more likely is a bad economic outcome; second, that coup attempts are more likely to succeed when there is widespread discontent with the incumbent autocrat. We have found that to some extent the possibility of a coup moderates the autocrat's opportunism if he is "punished" when the *short-run* performance of the economy is bad but "rewarded" with a higher probability of remaining in power when it is good. We have tested two implications of the model – (i) the probability of a coup attempt increases when there are recessions, and (ii) the probability of a coup attempt increases when there are more open demonstrations of discontent – and found that they are consistent with the evidence.

To some extent our empirical findings weaken the common contention in the literature that underdevelopment is the main determinant of coups. It is unlikely that the support of the citizenry depends on the average level of income, because it changes only slowly over time. Nevertheless, as the work of Londregan and Poole suggests, our empirical finding rests on having excluded developed economies from the sample, where coups happen very infrequently. We think that this exclusion is warranted, because what distinguishes developed economies from LDCs as far as coups are concerned is the quality of political institutions. In developed countries political competition occurs within the bounds set by institutions, but not so in most LDCs. Of course, one might argue that economic development breeds political development, but this ignores that most of today's developed countries did not experience coups in the nineteenth century when they had per capita GDP levels similar to those of many developing countries today.

The data show that coup attempts are less frequent in country-years classified as democracies. While the model assumes an autocracy, one may speculate that coups should be less frequent where institutions make incumbents more accountable and norm the transfer of power. Democratic institutions such as the separation of powers and functions within the government, political opposition, and elections all help to prevent that discontent with the incumbent prompts the citizenry to remain passive when a plotter attempts to seize power by force. Understanding which features of democratic institutions make coups less likely, and why coups occur in democracies may be a promising area for research.

The conflict of interest between the citizenry and the ruler that exists in autocracies suggests that in them political competition is not so different from political competition in democracies. The difference may be mainly a matter of institutions. In democracies political competition is normed by elections and the actions of rulers are constrained by institutional checks and balances; by contrast, in most autocracies these institutions are conspicuous by their absence. Coups may be viewed as a quite costly and imperfect substitute of these institutions; they both partially discipline incumbents and allow their replacement.

The last remarks concern the issues that we have not addressed in this paper. First, we have modelled coups as a black box, which is summarized in

equation (2), and we have assumed that a coup is more likely to succeed when the citizenry is willing to obey a new ruler. Future research should enter into this black box and explain what happens in the 24 to 48 hours that follow the beginning of a coup and where typically its fate is decided. Second, we left out a number of agents that are important. For example, we did not allow interest groups to form. Interest groups may affect the likelihood of a coup, and autocrats usually try to buy their support. Third, we have not allowed autocrats to repress the citizenry and prospective plotters, which is one of the main instruments autocrats use to block the action of plotters and secure office.

APPENDIX 1

In this appendix we prove Propositions 1–3.

Proposition 1. If $1 \geqslant \Delta pV$ then $s = 1$; otherwise $1 > s = [\Delta pV]^{-\sigma} > 0$.

Proof. The autocrat chooses s to maximize

$$[p_N - s\Delta p]V + As^{1-(1/\sigma)}, \tag{A1}$$

subject to $s \in [0, 1]$, with first-order conditions

$$-\Delta pV + s^{-1/\sigma} + \lambda_1 - \lambda_2 = 0,$$

where λ_1 and λ_2 are the respective multipliers with, of course, $\lambda_1, \lambda_2 \geqslant 0$. The complementary slackness conditions are

$$\lambda_1(-s) = \lambda_2(s - 1) = 0.$$

(a) First consider the case where $1 \geqslant \Delta pV$. Then $-\Delta pV + s^{-1/\sigma} \geqslant -\Delta pV + 1 \geqslant 0$ for all $s \in [0, 1]$, with strict inequality for $s < 1$. Thus $s = 1$ maximizes (A1), and the first part of the proposition follows.

(b) Now let $1 < \Delta pV$ and suppose $s = 1$ is optimal. Then, since $1 - \Delta pV < 0$, $\lambda_1 > 0$ and $\lambda_2 = 0$, otherwise the first-order condition cannot hold. But if $\lambda_1 > 0$, then complementary slackness implies that $s = 0$, a contradiction. This establishes the first inequality. Suppose next that $s = 0$; now $\lim_{s\to 0}[-\Delta pV + s^{-1/\sigma}] = \infty$; but if $s = 0$ then $\lambda_2 = 0$ (otherwise the complementary slackness condition cannot hold) and the first-order condition cannot hold. Now $[\Delta pV]^{-\sigma}$ is the only interior value of s that satisfies the necessary first-order condition. Since the objective function is concave in s, and the constraint set is convex, the first-order condition is sufficient for a unique global maximum. This completes the proof.[25]

Proposition 2. (a) Let $w_L < w_c$ or $w_L V \leqslant 1$. Then (i) coup attempts do not occur; (ii) recessions occur with probability 1.

[25] Since both constraints cannot bind simultaneously, the constraint qualification trivially holds.

(b) Let $w_L \geqslant w_c$ and $w_L V > 1$. Then (i) the unconditional probability that a recession and a coup attempt occur is $s = (Vw_L)^{-\sigma}$. (ii) The unconditional probability that a successful coup occurs is $1/V^{\sigma} w_L^{\sigma-1}$. Thus, the larger w_L the smaller s. (iii) Coups occur only when there is a recession.

Proof. By direct substitution.

Proposition 3. Let $q \equiv [\sigma(1-\beta)]/[(\gamma-\sigma)\beta]$ and let Assumption 1 hold. Then (a) $w_L = 1$ if $q \geqslant 1$; (b) $w_L = q^{1/\gamma}$, if $1 > q > w_c^{\gamma}$; (c) $w_L = w_c$, if $q \leqslant w_c^{\gamma}$.

Proof. We first show that, when Assumption 1 holds, $w_L \in [w_c, 1]$. In view of part (ii) of Assumption 1 it is sufficient to check that the autocrat will optimally select $s < 1$ if $w_L = w_c$. Recall that $w_N = 0$ and thus $p_N = 1$ in equilibrium, so that $\Delta p = w_L$. From part (i) of Assumption 1, $1 < w_c V$, which implies that $1 < \Delta p V$. Last, we know from Proposition 1 that if this inequality holds then the autocrat selects $s < 1$.

It follows that we can now rewrite the citizenry's problem as maximizing (5) subject to the autocrat's decision rule. Since $s = (w_L V)^{-\sigma}$, the citizenry solves

$$\max_{w_L} \{(1 - (w_L V)^{-\sigma}) y_N + (w_L V)^{-\sigma}(1 - w_L^{\gamma}) y_L\}, \tag{A2}$$

subject to $w_L \in [w_c, 1]$. The first-order condition of this problem is

$$B(q - w_L^{\gamma}) y_N - \lambda_1 + \lambda_2 = 0,$$

with $B \equiv (\gamma - \sigma)\beta V^{-\sigma} w_L^{-(\sigma+1)} > 0$; λ_1 and λ_2 are the respective multipliers (with, of course, $\lambda_1, \lambda_2 \geqslant 0$) and we have used the fact that $y_L \equiv \beta y_N$. The complementary slackness conditions are

$$\lambda_1(w_L - 1) = \lambda_2(w_c - w_L) = 0.$$

For future reference, note that the second-order sufficient condition of this problem is

$$-[(\sigma+1)(q - w_L^{\gamma}) + \gamma w_L^{\gamma}] B w_L^{-1} y_N < 0. \tag{A3}$$

(a) Let $q \geqslant 1$. Then $B(q - w_L^{\gamma}) y_N \geqslant 0$ for all $w_L \in [w_c, 1]$, with strict inequality for $w_L < w_c$. Thus $w_L = 1$ maximizes (A2), and the first part of the proposition follows.

(b) Let $1 > q > w_c^{\gamma}$ and assume $w_L = 1$. Then $B(q - w_L^{\gamma}) y_N < 0$ and the first-order condition can hold only if $\lambda_2 > 0$. But then $w_L = w_c$, a contradiction. An analogous argument shows that $w_L > w_c^{\gamma}$. Now $w_L = q^{1/\gamma}$ is the only interior value of w_L that satisfies the necessary first-order condition; as can be seen from (A3), it also satisfies the second-order sufficient condition. The second part of the proposition follows.

(c) Let $q \leqslant w_c^{\gamma}$. Then $B(q - w_L^{\gamma}) y_N \leqslant 0$ for all $w_L \in [w_c, 1]$, with strict inequality for $w_L > w_c$. Thus $w_L = w_c$ maximizes (A2), and the third part of the proposition follows.

APPENDIX 2

List of countries and total number of coup attempts and successful coups:

Country	Coup attempts	Successful coups	Country	Coup attempts	Successful coups
Algeria	3	1	Iraq	10	3
Angola	2	1	Israel	0	0
Benin	9	6	Jordan	2	0
Botswana	0	0	South Korea	4	3
Burundi	4	2	Malaysia	0	0
Cameroon	0	0	Nepal	0	0
Central African Rep.	5	3	Pakistan	5	3
Chad	5	2	Philippines	0	0
Congo	8	3	Singapore	0	0
Egypt	6	1	Sri Lanka	1	0
Ethiopia	4	1	Syria	10	5
Gabon	1	1	Taiwan	0	0
Gambia	1	0	Thailand	7	6
Ghana	5	4	Cyprus	2	2
Guinea	0	0	Turkey	5	3
Ivory Coast	0	0	Barbados	0	0
Kenya	1	0	Costa Rica	1	0
Lesotho	1	1	Dominican Rep.	5	3
Liberia	1	1	El Salvador	3	2
Madagascar	2	2	Guatemala	7	4
Malawi	0	0	Haiti	4	1
Mali	2	2	Honduras	8	6
Mauritania	3	2	Jamaica	0	0
Mauritius	0	0	Mexico	2	0
Morocco	5	2	Nicaragua	4	1
Mozambique	0	0	Panama	3	1
Niger	3	1	Trinidad/Tobago	1	0
Nigeria	3	2	Argentina	13	6
Rwanda	1	1	Bolivia	16	8
Senegal	2	0	Brazil	3	3
Sierra Leone	4	2	Chile	3	1
Somalia	3	1	Colombia	5	3
South Africa	0	0	Ecuador	12	6
Sudan	2	0	Guyana	0	0
Tanzania	1	0	Paraguay	4	1
Togo	4	3	Peru	7	4
Tunisia	0	0	Suriname	3	1
Uganda	8	4	Uruguay	3	2
Zaire	3	2	Venezuela	5	1
Zambia	0	0	Fiji	0	0
Zimbabwe	1	1	Burkina Faso	4	4
Bangladesh	4	3	Yemen	5	1
Burma	3	2	Indonesia	3	1
India	0	0	Bahamas	0	0
Iran	0	0			

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REFERENCES

Alesina, A., 1992, Political models of macroeconomic policy and fiscal reforms. *WPS 970*, Policy Research Department (The World Bank, Washington, DC).

Brough, W. and M. Kimenyi, 1986, On the inefficient extraction of rents by dictators. *Public Choice* 48, 37–48.

Chaffee, W., 1992, *The Economics of Violence in Latin America: A Theory of Political Competition* (Praeger, Westport, CT).

Clague, C., P. Keefer, S. Knack, and M. Olson, 1994, Institutions and economic performance: a new look at democracies and growth. Mimeo, IRIS, University of Maryland.

Eckstein, H., 1964–65, On the ethiology of internal wars. *History and Theory* 4, 113–163.

Frohlich, N., J. Oppenheimer, and O.Young, 1971, *Political Leadership and the Supply of Collective Goods* (Princeton University Press, Princeton, NJ).

Galetovic, A. and R. Sanhueza, 1995, On the political economy of coups d'état. Mimeo, Universidad de Chile.

Grossman, H., 1991, A general equilibrium model of insurrections. *American Economic Review* 81, 912–921.

——— 1994, Production, appropriation, and land reform. *American Economic Review* 84, 705–712.

——— and S. Noh, 1990, A theory of kleptocracy with probabilistic survival and reputation. *Economics and Politics* 2, 157–171.

Gurr, T., 1970, *Why Men Rebel* (Princeton University Press, Princeton, NJ).

Hirshleifer, J., 1988, The analytics of continuing conflict. *Synthèse* 76, 201–233.

Jodice, D. and C. Taylor, 1983, *The World Handbook of Political and Social Indicators III* (Yale University Press, New Haven, CT, and Inter-University Consortium for Political and Social Research, Ann Arbor, MI).

Kimenyi, M., 1987, Bureaucratic rents and political institutions. *Economia Delle Scelte Pubbliche* 3, 189–199.

———, 1989, Interest groups, transfer seeking and democratization: competition for the benefits of governmental power may explain African political instability. *American Journal of Economics and Sociology* 48, 339–349.

Londregan, J. and K. Poole, 1990, Poverty, the coup trap, and the seizure of executive power. *World Politics* 42, 151–183.

——— and ———, 1992, The seizure of executive power and economic growth: some additional evidence, in: A. Cuckierman et al., eds., *Political Economy, Growth, and Business Cycles* (MIT Press, Cambridge, MA) 51–79.

Luttwack, E., 1968, *Coup D'État: A Practical Handbook* (Harvard University Press, Cambridge, MA).

McGuire, M. and M. Olson, 1996, The economics of autocracy and majority rule. *Journal of Economic Literature* 34, 72–96.

O'Flaherty, B., 1990, Why are there democracies? A principal–agent answer. *Economics and Politics* 2, 133–155.

O'Kane, R., 1981, A probabilistic approach to the causes of coups d'état. *British Journal of Political Science* 11, 287–311.

———, 1987, *The Likelihood of Coups* (Avebury, Aldershot).

Olson, M., 1965, *The Logic of Collective Action* (Harvard University Press, Cambridge, MA).

———, 1993, Dictatorship, democracy, and development. *American Political Science Review* 87, 567–576.

Persson, T. and G. Tabellini, 1990, *Macroeconomic Policy, Credibility, and Politics* (Harwood Academic, Chur).

Roemer, J., 1985, Rationalizing revolutionary ideology. *Econometrica* 53, 85–108.

Sanhueza, R., 1995, On the political economy of coups d'état and the hazard rate of political regimes. Ph.D. dissertation, University of Maryland, College Park, MD.

———, 1999, The hazard rate of political regimes. *Public Choice* 98, 337–367.

Summers, R. and A. Heston, 1991, The Penn World Table (Mark V): an extended set of international comparisons, 1950–88. *Quarterly Journal of Economics* 106, 327–368.

Tullock, G., 1971, The paradox of revolution. *Public Choice* 11, 89–99.

———, 1974, *The Social Dilemma* (University Publications, Blacksburg, VA).

———, 1987, *Autocracy* (Martinus Nijhoff, Dordrecht).

Zablotsky, E., 1992, An economic theory of autocracy: a public good approach to military coups d'état. Ph.D. dissertation, University of Chicago, Chicago.

Zolberg, A., 1968, Military intervention in new states of Africa, in: H. Bienen, ed., *The Military Intervenes: Case Studies in Political Development* (Russell Sage, New York).