

ESSAYS ON LIMITED AUTOCRACY

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Dedication

I dedicate this work to my wife, Rebecca Klick, whose support has never failed throughout the years leading up to this point.

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The work contained in this thesis has benefitted substantially from the comments of many. The project started with the development of the idea behind chapter 3 in David Lalman's Formal Political Theory class at the University of Maryland at College Park in 1998. The piece improved significantly over the years due in large part to helpful comments by Wally Oates, Charles Rowley, Robin Hanson, Gordon Tullock, and D. Bruce Johnsen. The entire project has benefitted greatly from the insights of Tyler Cowen, Thomas Stratmann, and Mark Grady.

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ABSTRACT

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All politicians, regardless of the institutional form of government within which they operate, face the trade off between using their power to expand current periods gains and tenure extension. That is, if a politician exploits his power too much, he will be removed from office; thus, a rational politician might temper his exploitation to secure additional periods during which he can exploit his power to a lesser degree. Effectively then, all politicians are limited autocrats. In the first essay of this dissertation, I model policy choices within the general limited autocracy framework where a politician maximizes the net present value of his rule, recognizing that the ultimate length of his rule is endogenous to his policy choices. This model provides insights into how government emerges within the stateless society and suggests the conditions under which a ruler might rationally cede power to democratic institutions to solve the precommitment problem he faces regarding his incentives to expropriate national income for his own use.

This limited autocracy model is then applied to a politician's choice of environmental standards. While a dictator's substantial share of national income provides a disincentive for him to protect the environment relative to a democracy's median voter, his tenure extension motive, which the median voter does not face, might induce him to set relatively high environmental standards. Because high environmental quality will make the dictator's people happier, without providing them with any additional revolutionary resources, this strategy will decrease the probability of the dictator being deposed. Using panel data techniques to control for cultural and income factors, I show that dictatorships do generally exhibit better environmental quality than do democracies.

The third essay looks at a democratic legislative agenda setter as a limited autocrat who can use his agenda control powers to either enrich his constituency or to pursue nationally favored policies to secure his party's majority position. If the agenda setter has a national constituency, these motives will coincide, however, I show that the procedure used to select the agenda setter in the U.S. House, the Speaker, creates a divergence between these two strategies. I present empirical evidence suggesting the Speaker, historically, has chosen to represent his constituents rather than national interests.

Limited Autocracy

The distinction between democracy and dictatorship is smaller than it superficially appears. While it is true that dictators do not face the popular control of the voting booth, to claim their actions are untempered by the popular will would be a misstatement. Similarly, while the politician in a democracy is unlikely to ignore public opinion, he generally has considerable leeway to act under the voters' radar.¹ Effectively, no politician is wholly constrained or completely unconstrained by public opinion in redistributing income to himself. Regardless of institutional structure, the underlying mechanism that determines the extent of his redistribution is the politician's desire to retain his control and his subjects' ability to unseat him if he redistributes too much.

The channels through which this mechanism works are determined institutionally. In a democracy, if the politician abuses his power to a degree greater than his people are willing to accept, they vote him out of office. In a dictatorship, removal requires some sort of coup or revolution. Other institutional arrangements can also limit the politician's

¹ There are many potential explanations for this. Rational ignorance (Downs 1957) is one candidate, while the public choice distinction between the concentrated benefits and diffuse costs of many policy decisions (Buchanan and Tullock 1962) is another.

power, such as constitutional or legal constraints on redistribution, but even these are somewhat dependent on the will of the people.²

Just as democratic politicians can often safely ignore formal restrictions on their power,³ it may sometimes be in a dictator's interest to impose formal restrictions on his own power. For example, if a dictator is completely free to take any private property from his subjects at his discretion, the people's incentive to produce and invest will be largely extinguished, leading to a reduction of his ultimate potential tax revenue.⁴ However, if he could credibly commit to a regularized tax policy, the incentive would be restored. Such a commitment would necessarily imply some reduction in the dictator's power, as it would require some enforcement mechanism whereby the ruler would be penalized if he broke the commitment. Thus, even a dictator might rationally implement the rule of law, precisely because it would limit his powers.⁵

² Persson, Roland, and Tabellini (1997) stress that the separation of powers is a necessary constraint on democratic policy makers. Their argument relies on the fact that elections occur only at discrete intervals after which politicians are largely free to abuse their power. The separation of powers then is the mechanism by which continuous accountability of elected officials is ensured.

³ Perhaps erosion of the U.S. constitutional protection against government takings of private property could be cited as an example of this.

⁴ Schelling (1960) makes the point that a party unable to bind itself to a commitment cannot enter into an effective agreement.

⁵ How a dictator, or any politician or group of politicians, can construct the institutions necessary to generate the rule of law is beyond the scope of this paper. In democratic regimes, such as the United States, this has involved designing a system of checks and balances under which the various power centers of the government operate. For a dictatorship, it may involve lowering the costs of revolution in the event

This paper discusses this view of government as limited autocracy in which all politicians, regardless of the nominal form of government within which they operate, face the trade-off between abusing their power for current personal gain and tempering the use of that power in order to secure the continuation of their rule. Previously in the literature, there has been a surprising lack of continuity between the general focus on tenure extension in the public choice models of political activity and political economy explanations of the emergence and behavior of the state.⁶ This paper represents an attempt to integrate the material analytically. The paper begins by examining some of the literature on politicians' (democrats and dictators alike) motives indicating that tenure extension is a driving force in their actions. The paper then goes on to model limited autocracy formally, drawing upon Mancur Olson's stationary bandit insight and its deficiency in not recognizing the importance of this tenure motive. A few cases where the tenure extension motive dominates the current period income appropriation motive are then discussed.

that the dictator oversteps his bounds. Alternatively, the dictator could invite some third party to monitor his activities, providing the population at large with information regarding the dictator's activities. With this kind of transparency, the dictator risks losing his reputation with his people, potentially leading to smaller long-term gains to him.

⁶ For a review of this material, see Hardin (1997).

The Politician's Motives

The underlying theme of most positive models of political activity is the politician's desire to maintain his position of power.⁷ This motive can be found in the literature regarding democratic and dictatorial politicians alike. In the well-developed literature that formalizes electoral models, this position maintenance motive is the driving force in political activity. For the smaller body of work on dictators, this motive is also stressed.

The Democrat

The fundamental assumption in Downs's (1957) work is that "parties formulate policies in order to win elections." According to Mueller (1989), "the Downsian model remains the most frequently employed formulation" of the issue of how democratic politicians behave.⁸ Even in many of those models where political actors are assumed to

⁷ Of course, this desire to stay in power is necessarily predicated on some more fundamental desire to receive the benefits of power such as wealth, prestige, the ability to impose your will upon others, etc.

⁸ This is true of deterministic voting models of the Downs (1957) or the Black (1948) type, as well as the probabilistic voting models of which Coughlin and Nitzan (1981) is representative.

have policy preferences,⁹ the importance of those preferences is tempered by voters' reactions to them.^{10,11}

If we diverge from simple voting models, the desire of politicians to retain their power position is still important. For example, in many of the models of campaign contributions, the probability of being reelected is an important determinant of contributions.¹² Also, clearly in any institutional structure whereby benefits accrue to seniority,¹³ the reelection motive would be quite strong. Thus, no matter what the democratic politician's instrumental motive is for seeking office, the achievement of and continuance in that position of power are of primary concern to him.

The Dictator

The limited analytical literature on the actions of dictators¹⁴ also indicates that the retention of power is a driving motivation for their activities. In Wintrobe's (1998)

⁹ See, for example, Grossman and Helpman (1996).

¹⁰ In Alesina's (1987) paper where policy preferences and rational expectations were first incorporated into these models, the probability of winning an election was determined exogenously. In later refinements, this assumption was relaxed.

¹¹ Drazen (2000) makes the point that it may not be possible or even important to sort out partisan motives from opportunistic motives since, in order to implement any policy, getting elected is a necessary condition. Therefore, regardless of the politician's instrumental motive, securing power is important.

¹² See, for example, Snyder (1990).

¹³ Such as Weingast and Marshall's (1988) model of the U.S. Congress.

¹⁴ In this paper, I do not distinguish among the various types of dictatorships or other authoritarian regimes that have been classified elsewhere. By no means does this indicate that there are no interesting

systematic study of the political economy of dictatorships, there is a large emphasis placed on the dictator's desire to avoid being overthrown. Wintrobe discusses how dictators invest a significant amount of their resources on internal security, repression of communal dissent, and the provision of gifts to generate goodwill among their people.¹⁵ In Tullock's (1987) work on autocracies, he provides a mass of anecdotal evidence suggesting that security is among the autocrat's foremost concerns.¹⁶

There has been a disjunction in the field of political economy. On the one hand, the models of political behavior overwhelming unfold from the politician's desire to hold on to his power. However, on the other hand, this motivation is not invoked in the economic theories of the origin of the state. The limited autocracy model of government is an attempt to remedy this disunity.

analytical distinctions among the forms of authoritarian regimes; instead, it indicates my contention that, at some abstract level, the actors within all regimes exhibit many behavioral similarities.

¹⁵ This notion is not new, as it has long been recognized that the provision of "bread and circuses" might tend to blind a people to its leader's abuses.

¹⁶ Tullock, however, suggests that threats invariably come from within the dictator's own government, suggesting that it is unlikely that there has ever been a true popular revolution of the people.

The Limited Autocracy Model

The desire to secure and extend tenure is one of the driving forces in every political activity, regardless of the surrounding institutional structure. This desire tempers the use and abuse of power by political actors, as they attempt to use their positions to expropriate as much surplus as possible without endangering their rule. The stationary bandit model represents the best attempt so far to incorporate the ruler's explicit income maximization in a story of how government emerges and functions, showing why a rational autocrat would limit his taxation and provide public goods to some extent. However, the stationary bandit model fails to recognize the centrality of the tenure extension motive in political decisions, limiting its usefulness as a positive description of government. Further, this failure biases the empirical predictions regarding taxation and public good provision as their effects on tenure extension are ignored. A richer story of political activity then must include this fundamental assumption regarding tenure extension, indicating its positive effects on public good provision and dampening effects on taxation.

The autocrat's problem then is one of maximizing the net present value of his rule, recognizing that his policy decisions affect the length of his tenure as well as his period-by-period draw from national income. The final period of his rule, T , is dependent on the security of his reign, S , which in turn depends on his policy decisions over the

level of taxation, t_x , and the level of public good provision, G . Following McGuire and Olson's (1996) one-period stationary bandit model, the autocrat's provision of public goods is constrained by his level of income. Once the one-period model is abandoned, however, it would be possible for the autocrat to provide public goods out of his savings from previous periods. For simplicity, the no-borrowing/no-dissavings constraint is imposed here as well, though the qualitative results of the analysis are not dependent on this simplification. The problem facing the tenure-conscious, or limited, autocrat then is:

$$\text{Max}_{t_x, G} \int_0^{T(S)} e^{-\rho t} [t_x r(t_x) Y(G) - G] dt \quad \text{s.t. } G \leq t_x r(t_x) Y(G).^{17} \quad (1.1)$$

where:

G = Amount of public good factor input with a price = 1;

Y = Potential gross private good production;

$Y-G$ = Potential net private good production; and

$$Y = Y(G); \frac{\partial Y}{\partial G} > 0; \frac{\partial^2 Y}{\partial^2 G} < 0; Y(0) = 0.$$

In this set-up, the public good G is essential for production as it represents, at minimum, the social order necessary to avoid a completely anarchic and lawless state.¹⁸ The public good, in this model, has no direct consumption value; thus, the autocrat will maximize national product net of the public good. The model also recognizes the difficulties of

¹⁷ The expectation operator has been omitted from the presentation, though, of course, the maximization is relative to the autocrat's expectations regarding T , r , and Y as well as the various marginal effects in the computations.

¹⁸ For a discussion of how private provision of limited social order (e.g., property rights protection) in a state of libertarian anarchy is essentially unworkable (i.e., the public good nature of the social order will tend to generate institutions resembling coercive government institutions), see Cowen (1992).

being able to exact perfectly lump sum taxation by incorporating the deadweight loss due to taxation:

t_x = constant average “income tax” rate;

$r(t_x)$ = percent of potential Y produced a given t_x which is independent of the level of G ;

$$\frac{\partial r}{\partial t_x} < 0, r(0) = 1;$$

$1-r(t_x)$ = percent of $Y(G)$ lost due to excess burden of the tax;

$t_x r(t_x)$ = percent of potential $Y(G)$ collected through taxes.

As in the McGuire and Olson model, because the autocrat pockets the remainder of his tax revenues after paying for G combined with the no-borrowing assumption, the constraint will not bind. Thus, maximizing (1.1) using Leibniz’ Rule for differentiation of an integral yields the following first order conditions with respect to t_x and G respectively:

$$\left(\frac{\partial T}{\partial S} \frac{\partial S}{\partial t_x} \right) \left[e^{-\rho T} (t_x r(t_x) Y(G) - G) \right] + \int_0^{T^*} e^{-\rho t} \left[r(t_x) Y(G) + t_x \frac{\partial r}{\partial t_x} Y(G) \right] dt = 0 \quad (1.2)$$

$$\left(\frac{\partial T}{\partial S} \frac{\partial S}{\partial G} \right) \left[e^{-\rho T} (t_x r(t_x) Y(G) - G) \right] + \int_0^{T^*} e^{-\rho t} \left[t_x r(t_x) \frac{\partial Y}{\partial G} - 1 \right] dt = 0 \quad (1.3)$$

Rearranging (1.3) reveals:

$$\left[e^{-\rho T} (t_x r(t_x) Y(G) - G) \right] = \left(\frac{\partial T}{\partial S} \frac{\partial S}{\partial G} \right)^{-1} \cdot \int_0^{T^*} e^{-\rho t} \left[t_x r(t_x) \frac{\partial Y}{\partial G} - 1 \right] dt \quad (1.4)$$

Substituting (1.4) into (1.2) generates the following relationship:

$$\left(\frac{\partial T}{\partial S} \frac{\partial S}{\partial G}\right)^{-1} \cdot \int_0^{T^*} e^{-\rho t} \left[t_x r(t_x) \frac{\partial Y}{\partial G} - 1 \right] dt = - \left(\frac{\partial T}{\partial S} \frac{\partial S}{\partial t_x}\right)^{-1} \cdot \int_0^{T^*} e^{-\rho t} \left[r(t_x) Y(G) + t_x \frac{\partial r}{\partial t_x} Y(G) \right] dt \quad (1.5)$$

or, alternatively:

$$\frac{\int_0^{T^*} e^{-\rho t} \left[t_x r(t_x) \frac{\partial Y}{\partial G} - 1 \right] dt}{\int_0^{T^*} e^{-\rho t} \left[r(t_x) Y(G) + t_x \frac{\partial r}{\partial t_x} Y(G) \right] dt} = - \frac{\left(\frac{\partial T}{\partial G}\right)}{\left(\frac{\partial T}{\partial t_x}\right)} \quad (1.6)$$

That is, assuming $\frac{\partial Y}{\partial G} > 0$, $\frac{\partial Y^2}{\partial^2 G} < 0$ and $\frac{\partial r}{\partial t_x} < 0$, the bigger the marginal effect that the

public good has on tenure extension, the more of the public good the autocrat will supply, *ceterus paribus*. Similarly, even if the distortions induced by taxation are relatively small and the marginal effect of t_x on r is also relatively small, the autocrat will further limit his taxation to the extent that high taxes jeopardize his tenure. Effectively, the autocrat scales up the marginal value of his increase in public good provision to reflect its positive effect on his tenure, and he scales down the marginal value of his increase in tax rates to reflect the negative effect of increasing taxes on his tenure.¹⁹

¹⁹ This analysis is related to the employment literature on shirking, such as Shapiro and Stiglitz (1984). In those models, whether or not the worker shirks is a function of the cost to him of losing his job and the likelihood that he will get caught and fired if he shirks. In the Shapiro and Stiglitz model, the required or expected work effort is fixed and the choice facing the worker is to meet that level or not. If the income loss associated with losing the job is great (as would be the case in an environment of high unemployment or if his wage exceeds the market wage as in the various efficiency wage models) and it is

In general then, relative to McGuire and Olson's results, the politician will explicitly evaluate the marginal cost to increased taxation as being higher than just the present period income cost considered in their model. Similarly, he will evaluate the marginal benefit to public good provision as being higher than the present period increase in income.²⁰ Thus, all things equal, the limited autocrat will set lower taxes and provide a higher level of public goods than will McGuire and Olson's stationary bandit. Further, controlling for national idiosyncratic and institutional effects, the degree of public good provision and taxation should be related to a community's propensity toward coup or revolution,²¹ whereas the stationary bandit model makes no such prediction.

These differences also have some implications for the divergence between democratic and dictatorial regimes, to the extent that the effects of policy decisions on tenure differ under various institutional arrangements.²² For example, because leadership likely he will be caught in his shirking, he puts forth the expected effort. For the limited autocrat, abuse of power is analogous to shirking. In this model, the probability of getting fired increases with the degree of abuse.

²⁰ Some publicly provided goods might actually reduce the politician's security on the margin (e.g., education, health expenditures, etc.). For a discussion of this, see Klick, "The Environmentally Friendly Autocrat or It's Easy Being Green."

²¹ For an analytical investigation of the determinants of this propensity, see Sutter (2000).

²² In fact, it would seem that most of the effect of institutions operates through this effect on tenure extension. For example, in a world of explicit institutional constraints on the level of taxation where those politicians who ignore these constraints face some kind of punishment, invariably the possible punishments can be reduced to a reduction in tenure. This reduction could be achieved through direct removal from office or some sort of imprisonment, necessitating a removal from office. Perhaps the primary distinction

changes in democratic regimes tend to be less violent than they are in dictatorial regimes, where deposing a leader might very well end up in his death, perhaps positive payoffs during time periods $t > T$ for democratic leaders lessen the incentive to extend their rule, generating relatively higher tax rates and lower public good provision under democratic regimes. On the other hand, it is imaginable that the marginal effects of policy variables on rule retention are lower for dictators because of the high costs revolutionaries face in mounting a coup relative to the low cost voters face in unseating a politician.^{23,24} While the exact differences among various institutional regimes are theoretically ambiguous, it is clear that the tenure extension motive will affect policy decisions in all polities.

More importantly, the limited autocracy model of government has some implications for the emergence of democratic regimes in the first place. While Olson (1993) was pessimistic about the ability of his stationary bandit model to provide insights into the improbable transition from autocracy to democracy, the limited autocracy model provides more hope. Specifically, incorporating the time dimension both muddies and

between democratic and dictatorial regimes involves the cost to the people of bringing about the tenure reduction. In well-functioning democracies, the vote or the legal system can generally be used to temper the politician, whereas much more costly mechanisms relying on organized violence might be necessary in a dictatorship.

²³ See, for example, Tullock (1974).

²⁴ In Kuran's (1995) model of revolution, the difference in marginal effects is likely to be state dependent. That is, for some regimes (or for some periods within a given regime) the population might accept quite a bit of exploitation before any revolutionary movement is generated, while merely a "spark" would be sufficient to start a revolution in another regime.

illuminates the analysis of the autocrat's behavior. First, the time dimension creates the last period or time consistency problem that plagues much of the formal analyses of political behavior. That is, how can the stationary bandit precommit to less than 100 percent taxation? McGuire and Olson (1996) leave this question unanswered, essentially assuming it away in their one-period analysis, but the forward-looking limited autocracy model is forced to address it.

Essentially, the tenure extension motive provides some of the answer. His recognition of the detrimental effects on his tenure of overly exploitive policies allows the people to rely on his claim not to plunder. This is a simple application of the folk theorem whereby the threat of revolt and loss of future expected surplus is sufficient to keep the bandit from renegeing on his commitment, assuming the politician is sufficiently patient. Whether or not the conditions of the folk theorem are satisfied, however, presents some degree of uncertainty as to how the game unfolds practically. If the autocrat can manage to arrange for his succession,²⁵ the game is effectively an infinitely repeated game for which the folk theorem will hold, and the autocrat's commitment would be credible.²⁶ If, however, at some point during his reign the prospect of

²⁵ For a discussion of the difficulties in doing this, see Tullock (1987).

²⁶ Even if succession is unlikely, as long as it is possible, there is merely a probability of the reign ending during each period, rather than a 100 percent probability of the game ending at some uncertain point before a specified time period. Thus, the game unfolds as an infinite one. For a discussion of this distinction, see Rasmusen (1989).

succession disappears, the game reverts to a finite game, albeit one with an uncertain²⁷ end point, for which any commitment will not be credible.²⁸

Once this occurs, essentially there exist two scenarios facing the bandit. The bandit could revert to plundering the country, either fleeing with his gain to some other locale or remaining as the ruler of a very low production society where his inability to precommit extinguishes the population's incentive to invest or produce much beyond the subsistence level. Another option would involve resorting to institutional precommitment mechanisms such as constitutional protections, free elections, and some sort of fragmented government with its attendant checks and balances, where his ability to plunder during the last period is circumscribed. We might expect that a high discounting bandit would choose the former, while a low discounter would choose the latter. These distinctions, involving both the timing of the choice and the resolution of it, provide a framework in which the emergence of democratic institutions could be analyzed.^{29,30}

²⁷ Though an end point that is guaranteed to occur before time X which could be seen as the outer limit of his potential human lifespan.

²⁸ This is an application of Selten's (1978) chain store paradox.

²⁹ Currently, most analyses of history of these institutions have attributed their emergence to historical coincidence. See Olson (1993).

³⁰ For a discussion of other factors that might influence the bandit's choice, see Rosendorff (2001).

The Stationary Bandit and the Limited Autocrat

Olson's stationary bandit model grew out of his earlier notion of narrow vs. encompassing interests (Olson 1982), which he traced to his even earlier work on collective action (Olson 1965). Olson speculated that special interest groups with merely narrow interests would tend to generate sclerosis within the economy at large as they tend to block general progress that might diminish their members' surplus. However, those groups representing larger segments of society will tend to have an encompassing interest in overall economic growth. Accordingly they will be supportive of changes leading to greater economic efficiency.

“Encompassing organizations have some incentive to make the society in which they operate more prosperous, and an incentive to redistribute income to their members with as little excess burden as possible, and to cease such redistribution unless the amount redistributed is substantial in relation to the social cost of the redistribution (Olson 1982).”

Olson speculated that this might explain why the president, in the U.S. system, is less willing to support pork-barrel legislation than any individual congressman and why we should expect the legislative leaders of U.S. political parties to be marginally more

concerned with national consequences of policy decisions than are individual legislators.³¹

Olson (1993) developed this narrow vs. encompassing interest distinction into a theory of the emergence of the state and later formalized the model (McGuire and Olson 1996). In this theory, Olson posits that, in the midst of anarchy and its attendant roving banditry, one of the roving criminals will recognize that he could fare better if he settled down and confined his theft to a specific area. Further, he will find it in his interest to protect the area from other roving bandits who would compete with him; thus, he monopolizes the theft within his domain. From this monopoly position, the stationary bandit assumes an encompassing interest that gives him a stake in the welfare of those over whom he rules. He will recognize that wanton theft will severely diminish the incentives his people face to produce and invest, and that recognition will induce him to regularize his theft in the form of predictable fractional taxation.³² That is, if he commits to stealing less than 100 percent of his subjects' income through a standardized taxation system, his subjects will have the incentive to produce and save. Both the stationary bandit and his subjects will be better off under this system than they were in a world of roving banditry.

³¹ See Klick, "The Disciplined Dictator: Using National Elections to Temper a Legislative Agenda Setter" for an empirical investigation of this conjecture.

³² Shleifer and Vishny (1993) present an analysis of why taxation is superior to other forms of wealth extraction. Further, their argument provides a justification of why the stationary bandit would have an incentive to build strong government institutions in order to maximize his tax-theft, eliminating much of the rent erosion associated with corruption.

The stationary bandit will also face the incentive to provide income-enhancing public goods, in addition to his original provision of law and order and national defense, to the extent that their provision increases his tax revenue. For example, investments in infrastructure will increase the extent of the market, allowing for increased division of labor. This will generate Smithian growth,³³ increasing the wealth of the ruler. Other public expenditures, such as investments in education and public health projects, could also improve national income by improving human capital. As long as the marginal cost to the ruler is less than the marginal increase in tax revenue generated by the public good, he has the incentive to provide the good.

With these insights, Olson simultaneously questions the notion of both the predatory and the social contract models of government. With respect to the former, Olson claims the autocratic bandit is not like a wolf that merely preys on cattle, but rather the bandit is like “the rancher who makes sure that his cattle are protected and given water (Olson 2000).” Regarding the latter contractarian, or constitutionalist, model of the state, Olson conjectures that claims of voluntarism are unhistorical:

“Since history is written by the winners, the origins of ruling dynasties are, of course, conventionally explained in terms of lofty motives rather than by self-interest. Autocrats of all kinds usually claim that their subjects want them to rule and thereby nourish the unhistorical assumption that government arose out of some kind of voluntary choice (Olson 1993).”

With this framework in mind, Olson conceived of the stationary bandit as basing his policy decisions upon the rational maximization of his wealth. That is, the autocrat

³³ See Kelly (1997).

will provide the public good up to the point where its marginal effect on realized income is equal to the reciprocal of his tax rate. For illustrative purposes, if the autocrat has a tax rate of nearly 100 percent, he would essentially choose G to maximize realized income, but as his share of national income declines, his provision of the public good will decline accordingly. Olson and McGuire then go on to compare these policy decisions to the similar decisions made by majority coalitions in democracies, generally finding that the democratic regimes will set lower tax rates,³⁴ and they might choose to provide a higher level of the public good.³⁵

While this model presents a historically attractive story of the emergence and activities of the state, its focus on a one-period income draw misses many of the subtleties involved in an autocrat's policy motivations. Specifically, Olson only rhetorically considers the effects of a politician's time horizon, implicitly assuming that the politician's tenure is fixed or otherwise exogenous to his decisions. This represents a departure from other studies of the behavior of politicians, both democratic and dictatorial, as discussed in section II above. In that sense, the limited autocracy model of government, a direct though distinct extension of Olson's work, provides a more satisfying account of the emergence and behavior of government that seems to fit both

³⁴ This result is mainly driven by the fact that the members of the majority coalition receive income from both production and redistribution, so they not only face the deadweight loss effect in their redistributive tax revenue but in their lost production income as well.

³⁵ The actual difference in levels depends upon the relation between the autocrat's share of national income (t_x) and the majority coalition's share of national income generated through redistribution and production. If the latter is larger, the democratic regime will exhibit a higher level of public goods.

the standard behavioral assumptions of public choice and the historical evidence regarding political development better.

Specifically, while both the limited autocracy and the stationary bandit models suggest that we should observe an inverse relationship between the distortionary effect of a tax and the chosen level of taxation, the limited autocracy model further suggests that we should see an inverse relationship between the level of taxation and factors making removal of a ruler cheaper. Also, while both imply that we should observe a positive relationship between public good provision and the share of national income received by the political decision maker, the limited autocracy model goes on to suggest that we should see more public good provision in those situations where the ruler's hold on power is more precarious.³⁶

³⁶ For a specific empirical investigation of the limited autocracy model in the context of the provision of environmental quality, see Klick (2001b).

A New Perspective

This limited autocracy model of government provides a different perspective on some of the anthropological research on various political units. Many have claimed that the least developed social groups, bands and tribes, are essentially egalitarian.³⁷ In these polities, it is argued, there is essentially no ruler and decisions are made collectively with a nominal leadership³⁸ occupying a very limited role for which they are rewarded with relatively small increases in wealth or social stature.³⁹ As these societies develop economically through the practice of more complex agricultural techniques, the communities grow in size and a chief generally emerges to coordinate the activities of the widespread population. In these chiefdoms, the chief taxes the production of his people, and, when certain segments of the community experience economic downturns, he provides for them out of his tax revenue.⁴⁰ In fact, the political strategies of chiefs, as identified by anthropologists (Earle 1989), fit nicely within the limited autocracy model. To secure and extend their power, chiefs regularly engage in the giving of wealth to their people through feasts or other channels; chiefs also generally provide infrastructure

³⁷ See Middleton and Tait (1958).

³⁸ See Knauff (1991).

³⁹ See Service (1975).

⁴⁰ See Earle (1997).

within their communities. In order to expand their leeway in expropriating their community's wealth, chiefs make extensive use of force and indirect control mechanisms such as seizing control of existing principles of legitimacy, such as religious institutions.

In the limited autocracy model of government, the degree to which a ruler uses his power for personal gain is dependent on his people's sensitivity to his abuses, conditional on the given institutional structure. This sensitivity includes both the people's ability to overthrow their government and their complacency with the government. These broad stroke distinctions among the various stages of development of societies do not refute the limited autocracy model. In the band and tribe societies, it is likely that the people's ability to overthrow their government is high and their complacency with that government is relatively low. The high ability is explained by the small size of the groups; the small scale eliminates the collective action problems that plague revolutions in general. Further, since production in these societies is barely above the subsistence level, the ruler's defense and bribery budgets are necessarily limited. The low economic production also explains the low level of complacency found in these societies. Bare subsistence does not allow for the ruler to bribe his people significantly,⁴¹ and the people, in turn, have very little to lose from unseating their government. These factors together could explain the relatively low level of redistribution to the ruler exhibited within these tribes and bands. Conditional on retaining his position, perhaps the best the ruler can hope for is a marginal gain in social stature and wealth.

⁴¹ Though even in these societies, the most skilled hunters, who presumably would gravitate to positions of power, do generally divide up their kill among the community (Boehm 1999).

In the chiefdom, however, the size of the population, generally anywhere between 5,000 and 100,000 people, generates the typical collective action problems faced by a revolutionary movement. Further, the improved production found in chiefdoms allows the ruler to amass security mechanisms, while also providing the people with bribes when their economic situation worsens. Clearly, in this case, a given chiefdom will often represent a better alternative than does reverting to separate groups on the one hand or facing the uncertainty that comes with adopting a new ruler on the other. These factors would allow the ruler to expropriate a relatively higher proportion of his people's income than is possible within less developed groups, without jeopardizing his tenure. Thus, the same sort of behavior under the differing situations could plausibly generate the supposed egalitarian-hierarchical split between these types of social groups.

This model of political structure bares striking resemblance to Christopher Boehm's work on the propensity of humans and higher primates to resent domination.⁴² His underlying claim in that work is that this resentment, operating at the communal level, battles with the individual disposition of primates and humans to want to dominate others to achieve status and its attendant material benefits. In light of this proposition, Boehm attempts to describe the various leveling mechanisms less developed societies use to keep potential dominators in line, such as shunning or even executing those who aggressively seek power and deposing leaders who take too central a role in community decisions. From this analysis, Boehm suggests that humans are either hard wired for or they easily learn this tendency toward egalitarianism because its historic and geographic

⁴² For a general survey of this and related work, see Boehm (1999).

prevalence is too great to be attributed to environmental factors (Boehm 1993).

Unfortunately, there is no extension of this “reverse dominance hierarchy” model that explains why more powerful leaders emerge in more advanced communities.

Perhaps the change in perspective suggested by the limited autocracy model of government can remedy this shortcoming in explaining the cross sectional variation in these groups. If individuals do indeed harbor both an inclination to dominate and a resentment of being dominated by others, it would seem that variables changing either the community’s ability to resist domination by a talented politician or the politician’s ability to dominate, should explain the degree of power invested in a given leader. The leader, as a rational actor, will recognize his strengths and weaknesses and act accordingly, expropriating quite a bit of surplus when he is relatively secure, or when he can appease the community through bribes, and demurring when his position is less secure.⁴³

Olson’s stationary bandit model of government is intuitively attractive in the way that it avoids many of the practical shortcomings of both the predatory and the contractarian models of government. However, it does not sufficiently incorporate the fundamental trade-off politicians face between current period gains and tenure extension. This paper presents a model that explicitly recognizes the trade-off which all politicians face and suggests that this limited autocracy model of government might be relatively

⁴³ Recently it has been suggested that Queen Elizabeth II’s reluctance to indulge in elaborate celebrations for her 50th jubilee grew out of this sort of concern. Specifically, she believed the British public would be angered by any expensive show, providing support for the position that the tax-paying public should no longer support the monarchy.

robust in explaining what we observe empirically regarding the emergence and subsequent behavior of governments.

The Environmentally Friendly Autocrat or It's Easy Being Green

The literature on the policy preferences of autocratic regimes is generally underdeveloped. Regarding environmental policy preferences, this is particularly the case.¹ Although there are a handful of pieces that describe the environmental policies of individual autocracies,² articles by Congleton (1992) and Hubbell and Selden (1994) represent the only analytical work done on the subject.

In Congleton's intuitively attractive model, the choice of environmental policies within an authoritarian regime is compared to the similar choice within a democracy. Essentially, because the autocrat receives a larger portion of national income and has a shorter time horizon than the democracy's median voter, Congleton's model implies that the autocrat will choose a relatively low level of environmental protection. Empirically, Congleton suggests that the model conforms with the low environmental conditions observed in autocracies. He further supports his model with evidence that autocratic regimes are less likely to enter into global environmental treaties and conventions.

The existing analysis, however, fails to recognize one of the autocrat's primary concerns. While he generally does wish to maximize his income, he faces the trade-off

¹ For a survey of the literature on the political economy of environmental policy in general, see Oates and Portney (forthcoming).

² See, for example, Goldman (1972, 1985).

between high current period income and extending his tenure.³ That is, it may not be in his best interest to expropriate an excessively high amount of his nation's income if, in so doing, he incites his people to rise up against him. Essentially, a rational autocrat would recognize the endogeneity of his time horizon, and he would incorporate the effect his policies have on that horizon into his calculus.

While Congleton's insight regarding the differential between the respective shares of national income of an autocrat in an authoritarian regime and the median voter of a democratic regime still holds true, the concern for tenure extension is absent for the median voter, potentially counteracting the differential incentives the two individuals face regarding the maximization of national income. Thus, the relationship between regime type and environmental policy is not nearly as transparent as the previous work would imply. The complexity of the relationship emerges both theoretically and, surprisingly, empirically, as this paper shows using international panel data on pollution.

This paper presents a richer account of the autocrat's policy choices regarding the environment that acknowledges the dictator's dilemma. By imputing the tenure extension motive to the dictator, I show how he might rationally choose a higher environmental standard than his median voter counterpart. Further, I present empirical

³ Hubbell and Selden (1994) do incorporate this idea in a very simplistic way. They model the leader's one period environmental standard decision as being dependent on his probability of staying in office. That probability, in turn, is dependent on the utility of a representative citizen. They indicate that this section of their paper draws on Congleton (1992), but it differs significantly from Congleton's model specification.

evidence questioning the conventional wisdom that real-world autocracies exhibit poor environmental standards.

Model of Dictator's Choice of Environmental Standards

Following Congleton (1992), policy makers are assumed to maximize a utility function whose arguments are measured real income (Y) and environmental quality (E), where E represents a public good measured as an index of the average density of undesired chemicals in the environment. National income is a function of environmental regulations (E^*), market institutions (M), and resource base (R) in the country of interest. Y increases as R increases and as market arrangements become less centrally managed. Regarding the relationship between income and environmental standards, the two are directly related up to a certain level, as a modicum of environmental quality will improve the health and productivity of labor, as well as freeing resources used to protect individuals from the harmful environment. However, after some point, more stringent environmental regulations will harm national income as inputs are diverted to environmental improvement and less productive technologies are mandated.

The link between the environmental standard and environmental quality is assumed to be probabilistic, reflecting stochastic elements of the underlying environmental processes. A given individual's assessment of the probability of environmental deterioration, $P = p(E|E^*, Y)$, decreases as the environmental standard becomes more stringent and increases as national income grows.

An individual then prefers the environmental standard that maximizes his lifetime utility from time 0 to time T which takes the following form:

$$U^e = \int_0^T \left[U^0 P^0 + \int u(X, E, t) P(E|E^*, Y, t) dE \right] dt \quad (2.1)$$

where:

$$(1) U^0 P^0 = U(Y, E^0, t) \left[1 - \int P(E|E^*, Y, t) dE \right];$$

$$(2) X = vY;$$

$$(3) Y = y(E^*, M, R, t);$$

$$(4) T = T(C, A) \text{ for autocrats and } T = T \text{ for a democracy's median voter.}$$

Essentially, the agent conditions his choice of E^* upon maximizing his utility at the current environmental level E^0 multiplied by the probability that there is no decrease in environmental quality, plus the expected utility if environmental degradation were to occur. The individual's consumption, X , is a constant share, v , of national income.

Condition (4) above indicates the effect the autocrat's policies have on his time horizon. The length of an autocrat's tenure is a function of his subjects' complacency (C) and their ability to overthrow him (A).⁴ A people's complacency is going to be related to its overall happiness or, more generally, its utility level. Among the many things that enter individual utility functions will be income and environmental quality. Thus, in this model, a people's complacency will take the general form $C = f((1-v)Y, E, \alpha)$ where α represents a vector of exogenous factors, while Y and E represent income and environmental quality (as above). For simplicity, it is assumed that the complacency of

⁴ Complacency is a slight variation of Wintrobe's (1998) variable "Loyalty."

the people is a function of the national income not expropriated by the autocrat. This need not be strictly true. The autocrat could use some of his resources to provide gifts to his subjects in order to cultivate their favor, securing his rule. This option is ignored in the present model. The effects of each of the terms on complacency is represented as follows:

$$(5) \quad \frac{\partial C}{\partial Y} > 0, \quad \frac{\partial C}{\partial E} > 0$$

As people become richer, they tend to be happier and less displeased with their government.⁵ The notion that people will be happier, or more complacent, in a cleaner environment, is generally unobjectionable.

The assumed form of the people's ability to overthrow their government is similarly simple. This ability A is taken to be a function of income. Thus, $A = f(Y)$. It is unclear, however, in exactly what direction income affects this ability to overthrow. Clearly if individuals have a higher income, they will be better able to organize themselves against the government to the extent that communication tools can be purchased. Also, the more traditional tools of revolution, weapons, are likely to be more easily obtainable if the people tend to have higher incomes. However, a higher national income also increases the autocrat's income and, consequently, his ability to purchase the tools needed to suppress any revolution, such as improved police and military forces.

⁵ This too is a simplification. Although the proposition is reasonable, it can be argued that as people become richer, they will obtain access to more outside media that may tend to inflame the desire for a more liberal society or, even more generally, that liberalism is a normal good.

However, to further the analysis and to follow the practice in the literature, it is assumed that the net effect of income on ability to overthrow is positive:

$$(6) \quad \frac{\partial A}{\partial Y} > 0.^6$$

The time horizon for the median voter of a democracy, however, is exogenous to his decisions regarding environmental policy.⁷ That is, his position as the decision maker in a democracy is not conditional on the popularity or correctness of his decisions, but rather is a mere artifact of his placement in the distribution of preferences.

The maximization problem facing the autocratic politician then is:

$$U^e = \int_0^{T(C(Y,E),A(Y))} \left[U(vY, E^0, t)P^0 + \left[\int u(vY, E, t)P(E|E^*, y(E^*), t) dE \right] \right] dt \quad (2.2)$$

⁶ A reasonable argument could be made that, on net, the effect of income is greater for the autocrat's ability to suppress revolution than it is for the revolutionaries' abilities to revolt successfully because the tools of insurrection and counter-insurrection tend to be very costly; thus, the autocrat's budget share of vY puts him in a much better position to purchase weapons than does an individual's share of $(1/n)(1-v)Y$ where n is the nation's population. On the margin, however, such reasoning need not be persuasive. Further, it is not entirely clear that additional income improves the autocrat's counter-revolutionary abilities even if we focus entirely on his defense production function. If his income rises, he becomes a more attractive target for enemies from within his government who seek to secure that income for themselves.

⁷ This need not, strictly speaking, be true as the lifespan of the median voter might be affected by his policy choices. If this was the case, and he remained the median of the preference distribution, his tenure would not be exogenous to his choices. This case would presumably be highly unlikely; thus it need not trouble the present analysis.

Using Leibniz's rule for differentiating definite integrals, the autocrat's first order condition with respect to the environmental standard E^* now becomes:

$$\left[\frac{\partial T}{\partial C} \frac{\partial C}{\partial E} \frac{\partial E}{\partial E^*} + (1-\nu) \frac{\partial T}{\partial C} \frac{\partial C}{\partial Y} \frac{\partial Y}{\partial E} \frac{\partial E}{\partial E^*} + \frac{\partial T}{\partial A} \frac{\partial A}{\partial Y} \frac{\partial Y}{\partial E} \frac{\partial E}{\partial E^*} \right] \left[\int U(\nu Y, E, T^*) P(E|E^*, y(E^*), T^*) dE \right] + \int_0^{T^*} \left[\nu U_X^0 Y_{E^*} P^0 + U^0 (P_{E^*}^0 + P_Y^0 Y_{E^*}) \right] + \int \left[\nu U_X Y_{E^*} P + U (P_{E^*} + P_Y Y_{E^*}) \right] dE dt = 0 \quad (2.3)$$

The first line of (2.3) then shows the ultimate marginal effect of a change in the environmental standard on tenure multiplied by the expected utility in the last period. Let

$$(7) \quad \left[\int U(\nu Y, E, T^*) P(E|E^*, y(E^*), T^*) dE \right] = Q$$

so rearranging (2.3) yields:

$$\left[(1-\nu) \left(\frac{\partial T}{\partial C} \frac{\partial C}{\partial Y} \frac{\partial Y}{\partial E} \frac{\partial E}{\partial E^*} \right) Q + \int_0^{T^*} \left[\nu U_X^0 Y_{E^*} P^0 + \int \left[\nu U_X Y_{E^*} P \right] dE \right] dt \right] = \left[\left(\frac{\partial T}{\partial C} \frac{\partial C}{\partial E} \frac{\partial E}{\partial E^*} + \frac{\partial T}{\partial A} \frac{\partial A}{\partial Y} \frac{\partial Y}{\partial E} \frac{\partial E}{\partial E^*} \right) Q + \int_0^{T^*} \left[U^0 (P_{E^*}^0 + P_Y^0 Y_{E^*}) + \int \left[U (P_{E^*} + P_Y Y_{E^*}) \right] dE \right] dt \right] \quad (2.4)$$

which implies that the maximizing individual prefers the environmental standard that equates the expected present value of his subjective marginal cost for the standard in terms of reduced measured income and the value of a marginal reduction in complacency due to the loss in national income and the present discounted value of the stream of marginal utility from improved environmental quality and the value of the marginal increase in complacency due to the improved environmental quality plus the value of the marginal reduction in the people's ability to mount a successful coup due to their decrease in income.

To simplify the analysis, all of the partial marginal effects of the choice of environmental standard on tenure are collapsed into the overall marginal effect on tenure such that:

$$(8) \left[\frac{\partial T}{\partial C} \frac{\partial C}{\partial E} \frac{\partial E}{\partial E^*} + (1-\nu) \frac{\partial T}{\partial C} \frac{\partial C}{\partial Y} \frac{\partial Y}{\partial E} \frac{\partial E}{\partial E^*} + \frac{\partial T}{\partial A} \frac{\partial A}{\partial Y} \frac{\partial Y}{\partial E} \frac{\partial E}{\partial E^*} \right] Q = (\alpha + \beta + \delta) Q = \frac{\partial T}{\partial E^*} Q$$

For those autocracies where $\alpha + \delta > |\beta|$, the marginal effect of increased environmental standards on tenure is positive, thus decreasing the marginal cost of improved environmental standards for the autocrat, generating a higher optimal standard. For those autocracies where $\alpha + \delta < |\beta|$, the tenure effect raises the marginal cost of improved standards, leading to a lower optimal standard.

For the median voter, the first order condition yields:

$$\left[\int_0^T \left[\nu U_X^0 Y_{E^*} P^0 + \int \left[\nu U_X Y_{E^*} P \right] dE \right] dt \right] = - \left[\int_0^T \left[U^0 (P_{E^*}^0 + P_Y^0 Y_{E^*}) + \int \left[U (P_{E^*} + P_Y Y_{E^*}) \right] dE \right] dt \right] \quad (2.5)$$

which is identical to that for the autocrat, except for the absence of the tenure effects.

The divergence between (2.4) and (2.5) is instructive regarding the different strategies of the autocrat and the median voter. The difference does not simply result from differing shares of national income that accrue to each. We must also consider that there is this tenure extension motive for the one but not the other. This presents the opportunity to analyze the empirical evidence in a more sophisticated way than simply looking at the relationship between environmental quality and regime type. The true relationship is dependent on both the complacency level and revolutionary ability level of the people who live under the autocratic regime, as well as the specific value of tenure

extension to a given autocrat. Policy choices within an autocracy then will be determined by idiosyncratic features of the government and the people over which it rules. Because of this complexity, it is necessary to re-examine the empirical evidence concerning the effect of regime type on environmental policy choice with the goal of appropriately controlling for these idiosyncratic effects.

Empirical Analysis

The conventional wisdom that autocracies exhibit particularly low environmental standards⁸ is one that needs to be investigated. Because many autocracies tend to be very poor, the existence of environmental degradation may well be the result of income effects⁹ rather than governmental policy per se. Further, rigorous analysis needs to sort out government effects from cultural effects. Perhaps the taste for environmental quality varies from culture to culture. Because autocratic governments tend to be clustered geographically, a simple correlation analysis will conflate government effects with cultural or geographic effects. This section presents three different strategies aimed at isolating the effect an autocratic regime has on the environmental quality of a nation. The first analysis presents panel data techniques used to control for the influence of culture and income via country fixed effects. The second cross-sectional analysis focuses solely on a region with a high concentration of autocratic regimes, Africa, in the hopes of mitigating the influence of cultural effects. The third analysis rigorously examines

⁸ Casually, Congleton (1992) makes this claim. A more rigorous analysis, though one that still misses the subtleties investigated here, is Torras and Boyce (1998).

⁹ These income effects could be of two varieties. First, if a country does not have sufficient resources to adopt cleaner production technology, it may have a greater tendency to pollute. Second, if environmental quality is a normal good, individuals in poor countries will demand relatively lower environmental standards.

Congleton's evidence that autocratic regimes are unwilling to enter into international environmental treaties using a Logit model.

A. Panel Data Analysis of the Effect of Regime Type on Pollution Levels

Using the World Bank's Development Indicators dataset, I examined data on per capita carbon dioxide (CO₂) emissions for 209 (See Appendix A) countries during the time period of 1960-1996. I investigated the relationship:

$$(\text{CO}_2)_{i,t} = \alpha \text{ Regime} + \beta \chi_{i,t} + \varphi \text{ Durable} + \delta \text{ Time} + \nu_i + \varepsilon_{i,t} \quad (2.6)$$

where Regime is a variable describing the government form in place for country i at time t , χ represents a vector of nuisance variables, Time is a linear time trend, and ν_i represents the country fixed effect. For the Regime descriptor, I used the Polity IV dataset¹⁰ for my initial analysis and the Gastil index of political rights (now maintained by Freedom House¹¹) to check for robustness. The Polity IV data is the year 2000 edition of Ted Robert Gurr's longitudinal dataset which provides consistent ratings of each government's degree of autocracy and democracy starting in the year 1800, provided that the country achieved independence by 1998 and had a population greater than 500,000 by 1998. The political indicators are defined as follows:

¹⁰ Polity IV Project: Integrated Network for Societal Conflict Research (INSCR) Program, Center for International Development and Conflict Management (CIDCM), University of Maryland at College Park (www.bsos.umd.edu/cidcm/inscr/polity). Principal investigators: Monty G. Marshall and Keith Jagers.

¹¹ <http://www.freedomhouse.org/research/freeworld/FHSCORES.xls>

Polity: This variable from the Polity IV dataset subtracts a country's autocracy score (based on an eleven point scale) from its democracy score (based on an eleven point scale). A score of -10 represents the most autocratic countries, and a score of 10 indicates a high degree of democracy.¹²

A: This variable, generated from the Polity variable, is a dummy variable taking the value of 1 if the Polity score is less than or equal to -5 . Thus, this represents the most autocratic governments.

AA: This variable, generated from the Polity variable, takes the value of 1 if the polity score is less than 0 . Thus, it is a less restrictive indicator of an autocratic government than is the variable A.

Durable: This variable, from the Polity IV dataset, indicates how many years have passed since the most recent regime change for a country.

Polrts¹³: This political rights variable, taken from the Gastil ratings, indicates the degree of political rights a nation affords its citizens, with a score of 7 indicating the fewest political rights and a score of 0 indicating the most.¹⁴

¹² The institutional democracy scores depend on the competitiveness of executive recruitment, openness of executive recruitment, constraint on chief executive, and competitiveness of political participation. The institutional autocracy score depends on the same categories plus the regulation of political participation. For the exact scoring system, see the Polity IV codebook.

¹³ The Gastil indicators are only available back as far as 1972.

NF: A dummy variable taking the value of 1 if the country is determined to lack significant freedom as determined by the average of the Polrts variable and the other Gastil indicator “civil liberties¹⁵” which is scored in the same fashion as the political rights indicator. If this average was greater than 5, the country was defined as lacking freedom.

The nuisance variables were chosen on the basis of previous work done in the field of environmental economics. Also, other variables were chosen to proxy for the elements affecting the autocrat’s security and the value of his rule as described in the model described above. The primary explanatory variables chosen on the basis of previous research were GDP per capita (G), GDP per capita squared (G2), and GDP per capita cubed (G3). The cubic form of this income variable was chosen on the basis of existing empirical work related to the environmental Kuznets curve (EKC). The EKC hypothesis¹⁶ contends that there exists an inverted U relationship between per capita

¹⁴ For the Gastil Index, political rights are defined as the right “to participate meaningfully in the political process. In a democracy this means the right of all adults to vote and compete for public office, and for the elected representatives to have a decisive vote on public policies.”

¹⁵ For the Gastil Index, civil liberties are defined as “rights to free expression, to organize or demonstrate, as well as rights to a degree of autonomy such as is provided by freedom of religion, education, travel, and other personal rights.”

¹⁶ The EKC refers, by analogy, to the claim made by Kuznets (1955) in his 1954 address to the American Economics Association, that there exists an inverted U relationship between economic

income and pollution. That is, there is a tendency for environmental conditions to worsen as economies develop and then to improve once they become rich. Because the process of production generally creates pollution, it is reasonable to believe that, all things equal, pollution levels will increase as production increases. However, the claim is made that as people become richer, they demand environmental quality. That is, environmental quality is a normal good. Also, some make the claim, that as incomes rise, an individual's consumption bundle is likely to shift away from pollution intensive goods. On the supply side, some claim that the technological process generating high incomes is biased in favor of those goods that are less pollution intensive (e.g., services, high tech goods). In the seminal paper investigating the empirics of the EKC, Grossman and Krueger (1995) show that the proper specification involves the cubic specification of per capita income. They also indicate that a linear time trend is a reasonable specification of the time effects with respect to pollution.¹⁷

To proxy for the variables suggested by my analytics, I chose the following as potentially being important:

Population Density: Midyear population divided by land area in square kilometers. This variable was considered because of evidence that more densely populated countries naturally pollute more. Further, from an internal security standpoint, an autocrat might

development and income inequality. For a formal development of the EKC, see Bradford, Schlieckert, and Shore (2000).

¹⁷ They also investigated time fixed effects, but found the coefficients indicated a roughly linear trend.

be able to safely allocate his pollution to a lightly populated region of his country without engaging the displeasure of his people. If, however, the country is densely populated, no such area may exist.

Rural Population Density: Rural population divided by arable land area in square kilometers. If the autocrat faces the largest danger from those living near him in the urban areas, an autocrat whose population is concentrated in rural areas may feel safer to pollute.

Inflation: Consumer price index. This may serve as a useful proxy for the autocrat's patience level or discount rate. An autocrat prone to inflationary policies may be seen as having a high discount rate.

Population of Young Men (Young Men): Male population between the ages of 16 and 64. This demographic group is likely to represent the most serious revolutionary threat to an autocrat.¹⁸

Lifespan: Life expectancy at birth measured in years. This variable may be important with respect to the population's preference for current consumption relative to future environmental improvement.

Percentage of Total Population that is Illiterate (Illiteracy): The percentage of people aged 15 and above who cannot read or write a simple statement. If the Lipset conjecture

¹⁸ The work of anthropologists and socio-biologists suggests that dominance tendencies and the related tendency to resist domination are strongest among young men. On this point, see Boehm (2000).

(see below) is true, a more literate population will be more prone to demanding democracy.¹⁹

Percentage of School Aged Children Enrolled in Primary Education: The ratio of students enrolled in primary education to the official population estimate of the number of children whose age would make them eligible to attend primary education classes. Again, if the Lipset hypothesis is true, a more educated populace will demand more freedom.

Percentage of School Aged Children Enrolled in Secondary Education: The ratio of students enrolled in primary education to the official population estimate of the number of children whose age would make them eligible to attend secondary education classes. Again, if the Lipset hypothesis is true, a more educated populace will demand more freedom.

Government Consumption as a Percentage of GDP (GCons): General government consumption includes all current spending for the purchase of goods and services

¹⁹ Also, Hubbell and Selden (1994) suggest that autocrats may use their control over information as a way of keeping individuals ignorant about environmental issues, lowering their demand for environmental quality. In this case, ignorance is a substitute for environmental quality as regards complacency. In their model, this ability to substitute, combined with the lower cost of acquiring knowledge about consumer goods relative to environmental goods, for the representative citizen, induces the autocrat to prefer providing his people with utility through consumer goods. This, however, misses the effect such a choice may have on the people's revolutionary ability.

(including wages and salaries) as a percentage of GDP. For the autocrat, this would represent a reasonable upper bound on the per period value of his rule, but the same is not true for a democracy's median voter.

Tax Revenue as a Percentage of GDP (taxGDP): This variable includes all tax receipts collected by the federal government. For an autocrat, this would represent a reasonable upper bound on his share of national income, but the same is not indicated for a democracy's median voter.

N.B.: Following the logic of the model and the suggestion by Hubbell and Selden (1994), it would be useful to control for the use of substitute means of protecting the autocrat's rule. Specifically, controlling for the use of military and police forces to deter uprisings would be beneficial, but historic data regarding military expenditures or size of military forces is very limited, especially for autocracies.

To test the validity of the theory described above, I modeled per capita carbon dioxide emissions as a generalized least squares model with country fixed effect terms and a linear trend. Further, I controlled for G, G2, G3, Illit, and Dens.²⁰ To account for the specific political effects, I controlled for A²¹ and the durability of the regime. To sort out the effects of the tenure extension motive in autocracies, I controlled for Gcons and taxGDP for those regimes rated as autocratic.

²⁰ The results that follow were qualitatively similar when the other controls described above were used.

²¹ The results were robust to the other indicators of autocracy, AA, Polity, Polrts.

The results²² were as follows: ²³

Table 2.1: Properly Specified Regression Results

Observations	1268	
R ²	0.98	
Variable	Coefficient	t statistic
Year	-0.0958	-9.76
G	0.0006	10.00
G2	-0.0000	-5.50
G3	0.0000	5.51
Population Density	0.0012	3.95
Illiteracy	-0.0582	-6.93
Inflation	0.0000	1.11
Young Men	0.0000	1.72
Durable	0.0028	1.34
A*GCons	-0.0237	-2.61
A*taxGDP	0.0405	7.45
A	-0.4349	-3.05

As the model suggests, autocracies do indeed achieve better environmental outcomes once the empirical estimation is correctly specified. Further, also as to be expected in light of the model, as the value of the autocrat's rule (GCons) increases, he has a greater incentive to secure that rule by mandating better environmental standards. However, as indicated by the positive coefficient on taxGDP, which represents the autocrat's portion of national income, the autocrat does recognize the fact that higher environmental standards reduce national income. As his share of income increases,

²² For presentation, I have not reported the coefficients on the income variables or the time trend.

²³ The number in parentheses indicates the *t*-statistic for the coefficient.

higher environmental standards become more expensive for him; thus, the model properly predicted the coefficient on taxGDP.

Some of the other coefficients might not have been entirely expected in light of the model. There is a positive sign on regime durability, as we would expect since longer-lived regimes are less fearful of revolt, but this effect was not significant. Also, as to be expected, the higher inflation rate signifies a higher discount rate, generating marginally more pollution, but the effect also was not significant. Illiteracy generated a counter-intuitive result, in light of the model. That is, with respect to the Lipset hypothesis, we should have expected a less educated population to accept a lower environmental standard, but the data do not suggest this. Perhaps less educated people simply have a taste for better environmental conditions at the cost of lower income compared with more educated people. A similar argument might explain why young men, which was supposed to represent propensity toward revolution, actually indicated a positive effect on pollution. As relatively high discounters, perhaps young men prefer income to improved environmental quality relative to other demographic groups.

There is, no doubt, the potential problem of endogeneity of the income variables as is certainly implied by the formulation of the model. Although the endogeneity problem does not involve the variable of interest, regime type, for completeness I attempted to discount the possibility that the endogeneity was biasing my results. I estimated a two stage least squares model in which I modeled income in the first stage as a function of time, population density, and illiteracy, and then re-estimated the country

fixed effects model via generalized least squares where I used the synthetic income estimates as instruments.

Table 2.2: Two Stage Least Squares Regression Results

Observations	1451	
R ²	0.97	
Variable²⁴	Coefficient	t statistic
Year	0.2363	4.12
G (synthetic)	-0.0024	-4.26
G2 (synthetic)	-0.0000	-1.81
G3 (synthetic)	0.0000	7.38
Illiteracy	-0.1862	-4.24
Inflation	-0.0000	-0.26
Young Men	0.0000	2.03
Durable	0.0096	4.55
A*GCons	-0.0182	-1.92
A*taxGDP	0.0382	6.65
A	-0.4112	-2.86

The coefficients seem to be robust to the use of the income instrument. Further, as indicated above, the results are robust to the use of varying regime indicators, as well as the use of a broad range of other covariates. Although this empirical evidence alone is not entirely persuasive regarding the claim that autocrats set relatively high environmental standards, all things equal, it does represent a serious challenge to the conventional wisdom regarding the environmental policy preferences of autocrats. The results that follow suggest that the conventional specifications of the effect of regime on

²⁴ Population density was not used in this specification to avoid singularity.

pollution, where the tenure effects are ignored, can generate the misleading conclusion that autocracies do set lower environmental standards.

Estimating a generalized least squares model controlling only for income effects and the time trend does indeed yield a strong positive relationship between pollution and autocracy.

Table 2.3: Regression Results Using Only Regime and Income

Observations	2921	
R ²	0.53	
Variable	Coefficient	T statistic
Intercept	357.1998	14.41
Year	-0.1813	-14.52
G	0.0020	23.60
G2	-0.0000	-11.59
G3	0.0000	8.29
A	1.8873	10.41

However, when I add country fixed effects to the model, the results in explaining the level of CO₂ were as follows:

Table 2.4: Fixed Effects Regression Results Using Only Regime and Income

Observations	2921	
R ²	0.90	
Variable	Coefficient	t statistic
Year	-0.0443	-4.18
G	0.0005	5.25
G2	-0.0000	-4.19
G3	0.0000	2.83
A	0.0701	0.51

Even without controlling for anything more than country fixed effects, the time trend, and income effects, although the coefficients do imply a positive correlation between autocracy and pollution, the effect is not statistically significant for any of the specifications of autocracy.

Although panel data techniques offer a powerful tool for controlling for unobservable or unquantifiable characteristics, such as culture, it may be the case that the fixed effects over-control for many effects that might otherwise be interesting. To that end, I investigated the environmental quality issue using simple cross sectional analysis as well, where I attempted to control for varying cultural effects by focusing on one relatively homogenous area, Sub-Saharan Africa.²⁵ This region is the obvious choice to focus on, given the relatively high concentration of autocracies there.²⁶

Analyzing data for 1995, the most recent year available regarding carbon dioxide emissions in the World Bank dataset, I estimated the effect on per capita carbon dioxide emissions for the nations of Sub-Saharan Africa using generalized least squares.

²⁵ Undoubtedly there is rich variation among the cultures of Sub-Saharan Africa that this technique will miss. However, it is at least arguable that the countries in this region are relatively similar with respect to the rest of the world.

²⁶ Also, it represents a good choice to the extent that African political units and cultural units do not coincide particularly well, relative to much of the rest of the world.

Table 2.5: Cross Sectional Regression Results for Sub Saharan Africa in 1995

Observations	40	
R ²	0.57	
Variable	Coefficient	t statistic
Intercept	0.583	1.16
G	-0.0007	-1.08
G2	0.0000	1.93
G3	-0.0000	-1.97
A	0.169	0.50

In this cross sectional check on the panel estimates, it is impossible to say that autocracies do pollute more relative to democracies, at least in Sub Saharan Africa²⁷ for the year 1995.²⁸

Congleton makes the claim that authoritarian regimes are less likely to enter into international environmental treaties and conventions to support the validity of his theoretical work. He uses a Logit analysis of the decision of a country to sign the 1985 Vienna Convention or the 1987 Montreal Protocol, both international agreements regarding the output of chlorofluorocarbons (CFCs). Congleton analyzed whether or not a country was a signatory to the agreements by 1989. In an attempt to re-evaluate this evidence, I looked at which countries had signed these international treaties as of 2000, as

²⁷ Running the same analysis for the region of the Middle East and North Africa did provide a significantly positive coefficient on A, although this analysis did only involve 12 observations due to missing variables. The region of South America indicated a significantly negative relationship between pollution and A, but this analysis involved only 7 observations.

²⁸ The same analysis using the years 1984, 1985, 1987, 1988, and 1989 provided significantly positive coefficients on A, while the 1977 observations indicated a significantly negative coefficient on A. The rest of the years between 1960 and 1995 provided no significant coefficient in either direction.

well as other global environmental treaties, and the results are less convincing than Congleton's analysis suggests.

The Vienna Convention for the protection of the Ozone Layer, organized by the United Nations in 1985, committed nations to enact legislation geared toward reducing the emission ozone-depleting substances, as well as coordinating research efforts regarding the limitation of CFCs. Using only the polity indicator of regime type, as of the year 2000, it appears as though political regime is not a statistically significant determinant of, and, in fact, the estimated coefficient implies a positive correlation between autocracy and the choice to sign the treaty.

The Logit²⁹ analysis yielded the following results:

Table 2.6: Logit Results for Entry into Vienna Convention

Observations	143	
Log Likelihood	-24.84	
Variable	Coefficient	t statistic
Intercept	-3.13	-7.48
Polity ^{30,31}	-0.009	-0.39

²⁹ For each of these analyses, the results using a Probit specification were qualitatively similar.

³⁰ The use of the other regime indicators does not change the sign of any of the results in this section, though the significance in some cases is affected.

³¹ A negative Polity score signifies a relatively autocratic government.

The 1987 Montreal Protocol was more specific in its requirements regarding the form of the CFC reduction goals. It mandated that signatories reduce their CFC consumption by 20 percent relative to their 1986 levels by 1994 and 50 percent by 1999. However, allowances were made to ease the restrictions for developing countries. The Logit analysis of this treaty indicated essentially the same³² results:

Table 2.7: Logit Results for Entry into Montreal Protocol

Observations	143	
Log Likelihood	-24.84	
Variable	Coefficient	T statistic
Intercept	-3.13	-7.48
Polity	-0.009	-0.39

I also examined three other international environmental agreements. The Framework Convention on Climate Change, signed in New York in 1992 seeks to stabilize concentrations of greenhouse gases at levels that do not significantly interfere with the global climate. The results of Logit analysis of this treaty are as follows:

Table 2.8: Logit Results for Entry into Climate Change Convention

Observations	143	
Log Likelihood	-12.97	
Variable	Coefficient	T statistic
Intercept	-4.09	-6.03
Polity	-0.038	-2.12

³² For both treaties, only Rwanda, Sierra Leone, and the West Bank and Gaza had not signed by the year 2000.

The next treaty I examined was the United Nations Convention on the Law of the Sea signed in Montego Bay, Jamaica in 1982 but only became effective in 1994. This agreement established rules for environmental standards and enforcement mechanisms, including rules to prevent and control marine pollution. Analysis of it yielded the following results:

Table 2.9: Logit Results for Entry into Law of the Sea Convention

Observations	143	
Log Likelihood	-97.41	
Variable	Coefficient	T statistic
Intercept	-0.181	-1.06
Polity	0.021	1.43

The final analysis examined the Convention on Biological Diversity signed at the Earth Summit in Rio de Janeiro in 1992, which encourages scientific and technical cooperation among nations to promote conservation of biodiversity. The results were as follows:

Table 2.10: Logit Results for Entry into Biological Diversity Convention

Observations	143	
Log Likelihood	-23.05	
Variable	Coefficient	T statistic
Intercept	-3.27	-7.16
Polity	-0.033	-2.21

Contrary to Congleton's suggestion, autocracies might be more willing, or are at least not less willing to enter into these international agreements. The only two analyses which indicated statistically significant coefficients on the regime indicator (Climate Change and Biodiversity) suggest that autocracies are more willing to enter into agreements, and the only indication that they are less willing proved to be statistically insignificant (Law of the Sea). However, in defense of Congleton's proposition, democratic countries did generally sign these treaties more quickly than did autocracies. For the Vienna Convention, democratic signatories entered the agreement two years earlier than did autocracies on average. For the Montreal Protocol, Climate, and Biodiversity treaties, democracies entered less than two years earlier than autocracies, and the autocracies entered the Law of the Sea treaty slightly quicker than did democracies.

Though these Logit results are far from persuasive regarding the proposition that autocrats are more supportive of environmental goals for whatever reasons, they do suggest that Congleton's empirical evidence of the contrary proposition might not be complete. Regarding the speed at which countries enter these agreements, it is possible to imagine that the autocracies, given their usual roles as international pariahs, might use these agreements to leverage their international position in other areas. Perhaps by holding out longer, they can achieve better negotiating positions in the international organizations that organize the treaties. This idea deserves further investigation.

The Autocrat's Motives

“As for his subjects, when there is no external attack, the prince must worry about hidden conspiracies, against which he will find security by avoiding hatred and contempt and by keeping the people satisfied (Machiavelli, 1513).”

The rational autocrat of this paper is assumed to be a wealth maximizer. While others, including Wintrobe (1998) would claim such a generalization is not a completely accurate description of historical autocracies, it serves as a useful theoretical approximation. Even those regimes seeking less profane ends can advance their causes through increased income. For example, theocracies may use their funds to build elaborate temples, and those regimes tied to some particular political ideology or philosophy may fund propaganda and educational efforts. Even those regimes perpetrating ethnic cleansing can benefit from increased incomes to the extent that higher incomes will generally allow for increases in the scope or scale of their atrocities. With such a simplification made, this paper does not need to distinguish among the varieties of autocracy as they have been defined elsewhere.³³ Also, I make no distinctions on organizational grounds either; thus, I use autocracy, dictatorship, and authoritarian

³³ For example, Wintrobe's taxonomy specifies four types of autocrats (tinpots, tyrants, totalitarians, and timocrats).

regime interchangeably. While there are certainly interesting insights to be gained by focusing on institutional details, these are not the subject of this analysis.

The autocrat's problem then is one of wealth maximization. The autocrat looks to maximize the amount of income he can expropriate from his people over the course of his reign. However, except in the case of an extremely high discounter, this problem is not one of simply plundering the countryside for all it is worth with no concern for the country or its people. Instead there are two related ways in which the autocrat's expropriation is tempered.

The first involves the idea of an encompassing interest developed by McGuire and Olson (1996). According to McGuire and Olson, a stationary bandit who monopolizes theft in a region will find it in his best interest not only to limit his theft to a level below 100 percent of the region's income but, further, to provide public goods to those from whom he is stealing. "Paradoxically, he provides these public goods with money that he fully controls and could spend entirely on himself (Olson 2000)." While a roving bandit who strikes a given area only once or infrequently faces no such limit on his theft because he has no on-going interest in the area, the stationary bandit, because he has an encompassing interest in the region, recognizes the adverse effects his predation has on the region's income due to the deadweight loss his theft tax imposes on the economy; thus he limits his theft. In fact, he will often recognize that, by providing public goods, he can make the region more productive, increasing his overall net benefit. The stationary bandit is willing to make an investment in the future through his public good provision, whereas a roving bandit would not be in a position to collect the return on an

investment of this type. “A bandit leader with sufficient strength to control and hold a territory has an incentive to settle down, to wear a crown, and to become a public good-providing autocrat (Olson 2000).”

The second way in which the autocrat’s predation is tempered involves the threat of being deposed. It is often the case that it is a better prospect to expropriate some or most of an economy’s income over many years, than to expropriate everything during one year, only to be met with revolution as a by-product.³⁴ As indicated in the quotation from *The Prince* above, though certainly recognized from time immemorial, the autocrat, if he is to keep his position and in some cases his head, must keep his people happy, or at least not anger them too much. A substitute for making his subjects happy could be a strong security force that has the power to repress any revolution, even those that come from within his own inner sanctum.³⁵ More fundamentally, a general atmosphere of repression and closedness with respect to trade and outside information sources may deter potential revolutionaries from acting and may avoid inciting the development of the revolutionary spirit.

³⁴ Even in the case of autocracies seeking non-pecuniary ends, this desire to extend tenure would be strong. If one is spreading some religious or ideological message, the process of becoming entrenched in the national psyche and culture is likely to take some time, as it might involve reforming many of the nation’s cultural institutions. To that extent, it may be more attractive to make a relatively muted impression over many periods than to make a large impression during only one period.

³⁵ Tullock (1987) claims, with some qualification, that revolution always comes from within the government, and popular coups are essentially unknown in history.

Ignoring the revolutionary group dynamics that occur both within and outside of an autocratic government,³⁶ crudely speaking then, any dictator's rule is dependent on two influences. His people's complacency determines how willing others are to seek the autocrat's removal both passively by not coming to his support in the face of attack and actively by actually bringing force against him aimed toward his removal.³⁷ The second influence involves the people's net ability to revolt successfully. This revolutionary ability involves the subjects' organizational abilities, their financial resources, and a host of intangible factors of the people in general and of specific revolutionary leaders. Further, the autocrat's ability to put down the opposition is also important. This will depend on the autocrat's financial resources, the organizational structure of his government, and many idiosyncratic features unique to each individual leader.³⁸

The correspondence with McGuire and Olson's encompassing interest involves the attempt of the autocrat to extend his tenure by providing his people with goods. The idea, however, is a bit subtler than the simple use of bribes to curry favor with the populace. Certainly autocrats have always recognized the value of strategically given gifts or bribes. Gift-giving, or *euergetism*, as the historian Paul Veyne (1990) called it served a central role in the Roman empire. Strategically given gifts to the Army were meant to secure its loyalty, and the staging of the spectacular Roman games served to

³⁶ For more on these aspects of the problem, see Kuran (1995).

³⁷ This concept is very close to Wintrobe's variable "loyalty." I use complacency to capture a broader concept that includes both active support or goodwill and passive ambivalence.

³⁸ Wintrobe labels this factor "repression." My conception of the idea is from the standpoint of the revolutionaries for the sake of clarity.

ingratiate the people to the emperor. However, such bribery can cut both ways. While it may engender loyalty among the people or the military, it could also help to sow the seeds of the autocrat's eventual destruction. Particularly if the bribes can be liquidated, they may bring as much trouble as they do benefit. This can occur in two ways.

First, and more obviously, a gift that can be converted to cash or traded in some less liquid way, could be used to build up the arsenal of revolution in terms of either securing traditional weapons or in terms of building the organizational structure required of a successful revolution. The second mechanism through which bribes can be counterproductive is through the wealth effects they entail. Specifically, this refers to what is often called the Lipset hypothesis or what Lipset (1959) himself considered an Aristotelian hypothesis. That is, as income rises, a nation's social foundation becomes more receptive to and may even demand democratic political structures. Effectively, democracy is a normal good. While the theoretical justification for such an idea is somewhat hazy, there does seem to be substantial empirical evidence to support the notion.

The theoretical basis of the Lipset hypothesis is centered on the assertion that as incomes rise, citizens become more likely to converge to "democratic political tolerance norms," and, accordingly, they demand more political freedom. Along the same lines, Huntington (1991) claims that not only does economic development lay the groundwork for democracy to take root, but it also tends to destabilize autocratic regimes.³⁹ Although

³⁹ Olson's (1963) paper on the destabilizing effects of economic growth makes a similar argument, albeit a more general one to the extent that it implies destabilizing effects for a variety of regimes.

it is unclear what democratic political tolerance norms are or how they develop specifically, Lipset, in agreement with others, seems to place much importance on the development of a middle class for a nation to be sufficiently fertile for democracy to grow. In one of the few areas where empirical evidence is clearer than its theoretical antecedent, it appears that democracy is, in some sense, a normal good.

In his work on economic growth, Robert Barro has noticed the empirical regularity that national income is well correlated with the existence of democratic institutions. In Barro's (1997) work, an indicator of democracy, the Gastil Index of political rights, is regressed on a number of indicators of the standard of living using panel data spanning 1972-1994. Barro finds strong evidence indicating that nations do become more democratic as they become richer.

A more direct test of the nature of democracy was carried out by Jenny Minier (2001). In her test, she used the Gastil index to explain the occurrence of a democratic movement in a non-democratic nation. In this analysis, a democratic movement was taken to be a widespread public demonstration that was explicitly pro-democracy whose participants expressed their views physically. Using Logit analysis, she finds that the probability of such an event occurring is increasing in per capita income up to a level of \$5000, suggesting that, at least in a non-linear fashion, more income does induce people to demand more democracy.

With these considerations in mind, it would be useful for a dictator to search for a good that is not easily liquidated and that does not inflame any democratic yearnings of the people or improve their revolutionary ability in some indirect way. Generally

speaking, most public goods would satisfy the first of these conditions inasmuch as it is difficult to convert a non-excludable good into cash. The second of these conditions, however, may reduce the choice set significantly. For example, while a quality education system is not directly convertible to cash, an educated populace may very well demand more freedom and a greater role in political decisions. In fact, education was one of the major social requisites for democracy discussed by Lipset (1959). Well developed transportation and communication systems may also do more damage to a dictator's position than justified by the goodwill they engender with the people. Such systems may allow revolutionary forces to coordinate their activities better,⁴⁰ although the dictator's repressive efforts may be aided by these systems as well.

One "gift" to the people that may simultaneously satisfy both of these conditions is environmental quality. A clean environment does not make people richer in a financial sense, but, all things equal, it will certainly make the people happier or more complacent. Further, there is no obvious way in which the revolutionary spirit is ignited by a cleaner environment. Adding to the attractiveness of bribing people with a cleaner environment is the anecdotal evidence that individuals are very sensitive to environmental problems. This evidence, although largely unknown in the economics and formal political theory literature, has spawned its own research area in the fields of peace studies and conflict management, under the heading of "Ecoviolence."

⁴⁰ See recent events in The Philippines and Indonesia, for example.

Environmental Concerns and Civil Unrest

The analysis above implicitly assumes that environmental quality is salient with respect to individuals' evaluations of their rulers. That is, the model explicitly assumes that an autocrat's security is dependent on his people's reaction to the environmental conditions generated by his policies. In principle, this is unobjectionable as an individual's level of satisfaction with his ruler is likely to be influenced by the condition of his general surroundings. However, it is not completely obvious *a priori* that a people will be especially sensitive to its country's environmental conditions, so much so that these conditions hold the potential of generating civil unrest.

Empirically, however, this sensitivity has been established to some degree. In fact, many have recently argued that human-induced environmental pressures might seriously affect national and international security.⁴¹ Much of this literature has argued that a people's propensity to react violently to poor environmental conditions is especially high in those areas where income is very low and inequality, economic and

⁴¹ See, for example, Gleditsch (1997), Gurr (1985), and Matthews (1989). Simon (1989) describes how claims of natural resource scarcity have been invoked historically in attempts to rally the support of individuals for war efforts.

political, is very high.⁴² This analysis implies that this sensitivity is strongest within conditions highly associated with autocratic rule. Thus, if the tenure extension motive does drive policy decisions in autocracies as suggested in this paper, environmental policy holds a particular importance.

⁴² See Homer-Dixon and Blitt (1998) and Homer-Dixon (1999) which draw on several field studies performed over the course of more than a decade in areas such as Mexico, Gaza, South Africa, Pakistan, and Rwanda.

Foreign Policy Implications

This analysis suggests a tension that needs to be addressed in the international community's treatment of autocratic regimes. Assuming the liberal democracies of the world have the goals of spreading liberalism throughout the world and improving global environmental conditions, attempts to advance these goals simultaneously could be counter productive. That is, by inducing and helping a dictator to clean up his environment, the global community could be a partner in furthering his rule. International assistance in providing funds and technology to improve environmental conditions lower the cost to the dictator of placating his people. On the margin, this would make it less likely that the dictator's rule would be challenged.

There are also implications of this analysis for the international community's attempts to secure political rights for people worldwide. Specifically, some attempts to apply pressure on autocracies to liberalize incrementally might lower the internal pressures the autocrat faces. That is, incremental steps in the direction of liberalization could have the unintended (from the global perspective, that is) consequence of lengthening the autocrat's rule. From the international community's perspective, there is a trade off between making marginal gains in liberty and improving the chances of eliminating a particular autocracy altogether. To that end, attempts to educate and inform

the people living within autocracies, thus implicitly fomenting revolution, might prove to be a better strategy than appealing to the autocrat directly.

This paper presents a model of the environmental policy preferences held by autocrats relative to the median voter of a democracy, wherein the autocrat explicitly recognizes the value of providing high environmental standards with respect to the extension of his tenure. This recognition fits in nicely with Olson's idea of the encompassing interest held by the stationery bandit and its implications for public goods provision, but it stands starkly in contrast to the existing analytical and empirical analyses of environmental policy choice in democratic regimes. A more sophisticated investigation of the data, however, indicates that the limited autocracy model describes these policy choices better than the standard models.

The Disciplined Dictator

Few would argue that a committee's agenda setter holds a position of some power. The ability to add or delete proposals under consideration, to say nothing of the more sophisticated strategies involving proposal orderings, can potentially allow an agent to affect the resulting committee action greatly. Indeed, even the casual observer of a committee's activities can recognize this, and those who make careers of such activities are keenly aware of the extent of this power. It is no mistake that in the American political system, seniority in Congress is rewarded with agenda control positions with respect to the various committees that handle the bulk of legislative work.

Formal political theorists have attempted to discern the full extent of this outcome manipulation through agenda control. They generally choose the intransitivities inherent in majority rule voting, as discovered by Condorcet and later rediscovered by, among others, Duncan Black as their point of departure. This general lack of equilibrium leaves open the possibility of exploitation.

Charles Plott (1967) derived the conditions, in a general framework, under which an equilibrium will exist. In an n -dimensional policy space, the only way an equilibrium (i.e. a state in which there does not exist a motion that could receive a decisive vote from a majority) will be reached under the method of majority decision is if the resulting state represents at least one agent's optimal policy point and all other (i.e. those whose optimal

points are not achieved) agents' optimal points are aligned in diametrically opposed pairs about the resulting state.

Recognizing that it is unlikely such a state would be the regular state of affairs within most committees, McKelvey (1976, 1979) investigated the extent of intransitivities in this policy n -space. From this work, he finds "a rather surprising result, namely, that in the case where all voters evaluate policy in terms of a Euclidean metric, if there is no equilibrium outcome, then the intransitivities extend to the whole policy space in such a way that all points are in the same cycle set."

In a subsequent paper, McKelvey worked out the same result under more general conditions which require only that individuals have continuous utility functions over their preferences and that no two individuals' preferences coincide locally. From this general model, he concludes, "under any social choice rule meeting the conditions assumed here, it is generally possible to assign agendas based on binary procedures which will arrive at virtually any point in the alternative space, even Pareto dominated points."

Clearly McKelvey's results imply that he who controls the agenda wields considerable power. In fact, in the absence of tempering institutional considerations, an unfettered agenda setter can reach any policy outcome he wishes, including his most favored policy, within a finite number of votes. Subsequent work in this area has focused on strategic and institutional restrictions on the agenda setter's power, but nearly all have taken the cycling inherent in votes over multi-dimensional issues as a necessary condition for an agenda setter to manipulate committee outcomes, generating models of increasing complexity and of limited practical insight into the legislative process.

However, in practice, we often see a much more brutish form of agenda control taking place. There are many instances within the U.S. Congress generally and in specific committees of that congress where the agenda setter simply refuses to let some proposals come to a vote. By using procedural or quasi-procedural devices, the agenda setter effectively kills proposals he does not like. A striking recent example of this involved the 1997 nomination of Massachusetts Governor William F. Weld to the post of ambassador to Mexico. Senator Jesse Helms, then the chairman of the Senate Foreign Relations Committee refused to allow a hearing on Weld's nomination to take place, despite the request for such a hearing made by a majority of the committee members. Further, despite strong support for Weld from the Clinton Administration and many members of the Senate, Senate Majority Leader Trent Lott refused to allow a direct vote on Weld's nomination on the Senate floor. Although this sort of agenda control might not be as sophisticated as that modeled by McKelvey, it is assuredly an important device wielded by agenda setters.

This paper develops a simple model of agenda control within a world of single dimension issues. It then describes what would occur if an institutional setting similar to that found in the U.S. House of Representatives constituted the environment in which the agenda setter were to operate. Subsequently, practical issues which would limit the agenda setter's power and the model's relevance are identified. The model is then tested with data from the U.S. House. The paper concludes with a discussion of a mechanism to control an agenda setter who operates in the fashion described in the model, the policy

impacts of both the tempered and the untempered agenda setter, and possible extensions of the model and empirical test to multi-dimensional issue space.

The Model of Agenda Setting

A. The Frictionless Case

For clarity, I begin with an institutionally vacuous world in which the following assumptions hold:

- (1) All relevant policy issues are either inherently one-dimensional or can be collapsed into a single dimension (e.g., all policies can be defined with respect to a liberal/conservative continuum that is one-dimensional).
- (2) The agenda setter of the committee making decisions with respect to these policies issues is determined exogenously.
- (3) All policies are decided via majority rule with proposals treated in pairwise competitions.
- (4) There is no status quo (i.e., all policies expire at the end of a given committee term) that must be defeated by a victorious proposal.

- (5) The option “do nothing” is simply one of the infinite number of potential proposals lying along the continuum with no procedural advantage over any other proposal.
- (6) Of the two proposals at hand, a committee member votes for the one that is closer to his ideal policy.
- (7) The agenda setter knows the location of each committee member’s ideal policy with respect to all issues.

In this contrived legislative world, the agenda setter has little need for complex agenda manipulation techniques. He simply “kills” those proposals that will defeat his favored policy. Effectively, he will disallow any proposal that lies closer to the committee median voter’s ideal point than does his own favorite policy. Thus every proposal that actually comes to a vote will lose in a pairwise competition with the agenda setter’s ideal policy, making the agenda setter a legislative dictator.

Obviously the conditions of this model are extremely limiting and make the dictator’s strategy trivial and uninteresting. Assumption (2) will be eliminated in the section that follows, while the implications of dropping Assumptions (4),(5), and (7) will be discussed later in section C below, and suggestions for the effect of eliminating assumption (1) will be reserved for a separate section. Relaxing assumption (6), effectively a condition requiring sincere voting among the committee members, will be left to a subsequent paper.

B. Endogenous Agenda Setter Selection

If the agenda setter is chosen by a majority rule vote, recognizing the restriction imposed by assumption (1), the agenda setter will be chosen by the committee's median voter (or that voter will choose himself) and will be dependent on that voter for his continued re-election. Thus, as long as he desires to retain his position, the agenda setter will favor the set of proposals representing the median voter's ideal proposals and the issue of agenda control becomes moot. The agenda setter will not kill any proposal (unless there is some administrative efficiency to be gained from doing so) because, by definition, no proposal can defeat the median voter position. It is this result that has probably made the topic of single dimensional agenda control utterly uninteresting, as evidenced by its lack of development in the literature. However, if the agenda setter is not chosen by a vote of the committee (or a representative sub-set of the committee) itself, the resulting outcome manipulation is no longer trivial. Specifically, if the agenda setter is not dependant on the committee's median voter for the retention of his position, the agenda setter will have the incentive to kill a number of proposals, including that favored by the median voter himself.

The institutional structure of the U.S. House of Representatives presents an especially intriguing context for this aspect of the model. In the House, the primary agenda setter is the Speaker of the House.^{1,2} Traditionally this agent is selected de facto

¹ In principle, the argument would also apply to the other agenda setters in the House, specifically the committee chairs, although the role of seniority may limit the chairs' reliance on the majority party

by the party holding the majority of seats within the House.³ In my single-dimensional world, this leads to a Speaker who depends upon the support of the majority party's median voter, who will also be the House's median voter only in the case of a 100% majority.

The implication of this divergence of allegiance is not immediately clear. If the members of the majority party prefer that the Speaker uses his agenda control power to protect the party's majority position, the Speaker will support policies that are centrist with respect to the national electorate which are likely to approach the positions favored by the median voter of the House, a nationally representative body. In this case, I essentially reach an outcome qualitatively similar to that in which the full membership elects the agenda setter. However, if the members of the majority party prefer that the Speaker uses his agenda control power to favor their own individual proposals, the Speaker will kill nationally centrist legislation in favor of the more extremist positions of the party median.⁴

median. This may offer a competing rationale for the relatively extremist positions of committee chairs offered by Weingast and Marshall (1988).

² Gordon Tullock has suggested to me that perhaps the argument works equally well or better in relation to the majority party whip and the chairman of the House Rules Committee.

³ Strictly speaking, the Speaker is chosen by a vote of the full House membership. However, each party generally votes in block for its own candidate who had been chosen by a process only involving that party's members. Thus, the majority party is assured of its candidate winning the Speakership.

⁴ A third case does exist in which the Speaker uses his position for the one-shot gains to be had from exploiting his agenda control power to support his (non-median induced) sincere preferences. This

Graphically, in the left-right continuum of Figure 1, if P_M represents the majority party median voter's ideal policy, and H_M represents the ideal position of the median voter of the entire House, the Speaker will kill any proposal falling in the thatched set $(P_M, H_M + d\{P_M, H_M\}]$, where d represents the distance metric between the House median and the majority party median.

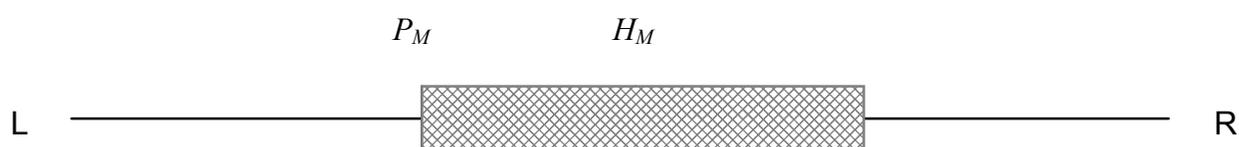


Figure 3.1: The Kill Zone

Clearly, in this set-up, nationally preferred policies (i.e., those that would be chosen via a direct referendum by the electorate) will never be allowed to come to a vote and only relatively extremist policies will reach a vote.

case can be disposed of in several ways. The simplest is the case in which the party median names himself or someone with identical policy preferences Speaker and then his sincere preferences will exactly mirror the median's. However, even if this does not occur, we can assert the Folk Theorem for repeated games which guarantees, if the Speaker is sufficiently patient and receives some non-zero benefit from holding office (e.g., salary, prestige, etc.), his expected payoff from the repeated game will exceed his potential one-shot gains from exploiting his power.

C. Relaxing Information and Procedural Assumptions

While endogenizing the agenda setter adds a modicum of reality to the model, its information and procedural assumptions still limit its application as a positive model of committee agenda control. However, the assumption that the agenda setter has knowledge of the members' ideal policy points can be relaxed without changing any of the model's implications. If the agenda setter can only know other committee members' preferences with some noise, but he knows his party's median ideal point (e.g., if the median names himself Speaker, this point seems trivial), he will merely expand his kill zone beyond his minimal perfect information kill range.⁵

The procedural assumptions are more difficult to relax. With respect to the non-existence of a status quo, while there are instances of legislation carrying an expiration

⁵ That is, the kill range becomes $(P_M, H_M + d\{P_M, H_M\} + \varepsilon]$, where ε is a decreasing function of his certainty of the other members' ideal points. The question then arises, however, why not kill all opposing measures as a rule of thumb, especially when information regarding members' ideal points is costly. For members of the majority party, the Speaker may be concerned with allowing members to gain the exposure that comes with having a proposal receive the extra attention that would be lessened if it were immediately killed. This is important to the extent that it helps to solidify the party's strength. However, the argument does not apply on the other side of the aisle, although there may be a different attention incentive there to the extent that extremist positions represent useful strawmen for the purposes of debate. Because the Speaker has some control over the direction of the debate, he can limit the opportunity for the minority party to make strawmen out of his own party's extremist positions. Further, as was the case with the Helms situation in the Senate mentioned earlier, there may be a public relations cost of wielding agenda control power too fiercely.

date, more often than not, that expiration date will not pass during the current legislative term. Also, many laws are implemented in an open-ended fashion such that they remain in effect until a new policy supercedes them.

As for the proposal “do nothing,” obviously this implicit proposal does have significant procedural advantages over other proposals. If this proposal as it relates to a given policy decision lies within the agenda setters kill range, in most cases, the agenda setter will be powerless to defeat it with his own policy. At best, he may be able to allow an alternate proposal which is closer to H_M than is “do nothing,” but he would be unable to secure his own favored policy. Both of these procedural artifacts represent potentially significant limits to the legislative dictator’s power.

Empirical Test of the Agenda Setter's Motive

A. Comparative Statics of the Model

As was indicated above, the activities of a Speaker acting in accordance with the proposed model could be motivated by two distinct forces depending upon the preferences of his party constituency. If a majority retention motive drives the party's selection of its Speaker, the Speaker will use his power to pass legislation that is centrist with respect to the full electorate. Presumably, these proposals would win their congressional votes against relatively extremist legislation; therefore there is little need to kill proposals for strategic reasons. Basically, the Speaker could allow all proposals to come to a vote without fear of nationally popular proposals losing.

However, if a policy preference motive drives the majority party's selection of its Speaker, there is clearly a role for strategic proposal killing. Since in this case the Speaker desires to pass proposals favored by his party's median, he must make sure no proposals lying within his kill range come to a vote, as they will likely defeat the party median's preferred policy.

The actual behavior of House Speakers provides a test to determine which of these competing motives drives the Speakers' actions. If the majority retention motive is the important force, there should be no effect on his proposal killing behavior when his

party's majority size changes. Effectively he would only kill proposal for administrative reasons (e.g., to winnow down the agenda in order to save time).

If the policy motive dominates, however, the size of a Speaker's majority is crucial in determining the size of his kill range. When the party holds a very slim majority, the party median will exhibit very extremist preferences with respect to the House median and the party median's preferred policy is susceptible to defeat by a large range of proposals. Thus, the Speaker must kill many proposals to assure the party median of victory. If the party holds a very large majority (e.g., 100% of the congressional seats in the limit), the party median will approach the House median, and there will be little need to kill competing proposals because the party median's position will defeat most other proposals.

In short, if the majority retention motive drives Speaker strategy, there should be no systematic relationship between the size of majority and the number of proposals killed. If the policy motive is stronger, a Speaker must kill any proposed legislation lying in the range, $(P_M, H_M + d\{P_M, H_M\}]$, where d is the distance metric. That is, the Speaker kills any proposal between P_M and X , where $X = H_M + H_M - P_M = 2H_M - P_M$. Any proposal lying to the left of P_M will obviously lose to P_M , as will any proposal to the right of X . Therefore, there is neither need to kill such proposals, nor is there harm from doing so. But the proposals lying between P_M and X must be killed, if the Speaker wishes to retain his office.

The choice of X implies a direct relationship between the percent of minority proposals killed and the size of the party's majority as measured by the number of House seats it holds:

$$\frac{\partial X}{\partial \text{Seats}} = 2 \frac{\partial H_M}{\partial \text{Seats}} - \frac{\partial P_M}{\partial \text{Seats}} = a - b, \text{ where } a \sim 0 \text{ and } b \neq 0. \text{ Thus, if } X \text{ is}$$

decreasing as majority size is increasing, there exists a smaller "kill range" and proportionately more minority bills are allowed to come to a vote. The fact that a is non-positive is obvious enough. If the majority party gains its seat by defeating a minority party member to the right of the original H_M , there is no effect on the congressional median. If, however, this defeat takes place to the left of the congressional median, the new congressional median is pulled toward the majority party extreme. To guarantee the sign of the b term, a seemingly plausible assumption must be made. First, it is assumed that no minority party member lies between the majority extreme and the majority median. Effectively this means that there are no extremely conservative liberal party members and vice versa. It is unlikely such a claim is objectionable. This implies that any gained seat will be achieved to the right of the original party median, drawing the party median closer to the congressional median. Thus, the distance between the two medians is contracted and the necessary "kill range" becomes smaller (In the limit of a one party House, the two medians will be equivalent).

Analyzing the relationship between the majority party's number of seats (*seats*) and the percent of total minority party proposals that are allowed to come to a House vote (*%min*) should allow us to determine which of the motives dominates. If there exists no systematic relationship, the policy motive can be rejected. However, if there is a direct

relationship between *seats* and *%min* the policy motive is supported. It appears as though this test is a powerful one. If in fact the policy motive were dominant, it would be a poor strategy to allow many minority party bills to come to a vote when a slim majority is held. In such a situation, the majority party is not in a position where it could easily defeat any opposition bills, given that just a few majority party defections would be needed to pass the opposition bill. As the size of the majority grows, more such defections are necessary. In effect, the majority party has a larger cushion.

If, however, the majority motive were dominant, in the case where the majority is slim, it would be a poor strategy to prohibit minority party bills from coming to a vote. In this situation, given the results of the previous Congressional election, it is likely that the populace's preferences are quite moderate with respect to the entire Congress. Therefore, the voters are likely to favor policies that reflect this moderation. To bring about these popular moderate policies, it is in the majority party's interest to allow most bills to come to a vote in the expectation that the broadly popular ones would in fact pass.

It would be useful to control for some other nuisance factors within this analysis. For example, the party affiliation of the sitting President may be important. A President of the same party as the majority House party could be used as a last line of defense so to speak. That is, if there is a particular policy that is generally popular but disliked by the majority party, the House could allow such a policy to come to a vote, knowing that even

if it passes, it is likely to be vetoed at the executive level.⁶ This could be modeled as a dummy variable, taking on the value of one if the President is of the same party as the House majority and zero if not. A similar argument could be made for including the influence of the Senate. This could also be modeled using a dummy variable, taking on the value of one if the same party holds majorities in both houses and zero otherwise.

Another potentially important factor is whether or not the Congress is in its first or second session. There may be some momentum factors, unrelated to agenda control, at work in each of the two years. For example, the majority party may, even if it does not intend to block any minority votes, simply have a back load of its own legislation that it wants to push through in the first year and kills minority proposals to speed up work on its own proposals. Similarly, the second year may exhibit some coalition building effects. While it is unclear exactly how these factors may influence the results, it seems important to control for them, so as not to unduly influence the results of interest. Along these same lines, it would be useful to control for the total workload entertained. That is, if the congress exhibits an especially high number of proposals, the agenda setter may wish to kill quite a few proposals even if they do not fall within the kill range for expediency.

This model could take the form of a fixed effects model. By taking such a form, one could allow for differences among the various Speakers used within the sample. It

⁶ However, such a consideration ignores the fact that a President serves a national constituency and thus his re-election chances are reduced if he vetoes nationally popular legislation. Perhaps, in this situation, the President serves as a poor last line of defense.

seems plausible, if not probable, that different Speakers will have different abilities to manipulate the agenda, either inherently or through learning by doing (e.g. a Speaker with a longer tenure may be more savvy than a short-lived Speaker). Also, it is not beyond belief that different Speakers have varying beliefs concerning agenda manipulation. For example, some Speakers may believe such manipulation is “unfair,” while others may believe it is part of their duty to their parties and their constituents. The true functional equation for each observation may then take the following form:

$$\%Min_{i,t} = \beta * Seats_{i,t} + \gamma * T_{i,t} + \alpha_i + \epsilon_{i,t} \quad (3.1)$$

where $T_{i,t}$ is a vector representing the nuisance characteristics, and γ is the corresponding vector of parameter values, and α_i is the non-varying Speaker specific term. $\epsilon_{i,t}$ is the error term with $E(\epsilon_{i,t}) = 0$.

It would be useful to break up the data from each Congress into two separate year-long time periods to allow for the momentum/coalition effects mentioned previously. It may also be interesting to break up the proposals by committee jurisdiction and then have a committee fixed effects model as well. This would allow for an analysis of whether or not different types of proposals are treated differently.⁷

Another less rigorous test may also contribute insight concerning the issue of motivation. Perhaps in the described scenario, the party median would choose himself as

⁷ Using proposals by committee as the unit of observation has the benefit of allowing for the differing extents of the procedural limitations of the model likely to be found within different legislative fields. For example, it may be the case that some committees generally treat non-expiring legislation or issues where “do nothing” is not political tenable.

Speaker, or, if the majority motive holds, the majority members will choose a centrist member directly as their Speaker. In the previous formulation, it was possible to separate a Speaker's duties as a representative and his duties as a Speaker. That is, despite its implausibility, he could vote one way and manipulate the agenda in another direction, because the two functions did not affect each other.

Potentially it may be more effective for the majority members to choose someone whose Speaker role and representative role were coordinated, reducing the need for a separate incentive to keep the Speaker centrist in his activities.

A simple test of which motive actually drives the selection process is to compare the ideological scores for Speakers relative to their party as a whole. Such scores are tabulated by a number of different interest groups. If the Speaker proves, in general, to be centrist with respect to his party, the policy motive is suggested. If he is extreme with respect to his party but centrist with respect to the whole Congress, the majority motive is suggested.

Using Poole and Rosenthal's roll call voting analysis⁸ in which they scale all of the U.S. legislators' votes over the period 1800 – 2000,⁹ I performed this analysis for the last two complete Speakerships (Gingrich, Foley).¹⁰ The results, using their DW-

⁸ These scores may be more reliable than those computed by interest groups because of selection issues. The interest groups (e.g., ADA) generally choose 10 to 20 votes which represent their specific policy interests to compute the scores, whereas Poole and Rosenthal use all roll call votes in their computations.

⁹ For a detailed discussion of the scaling process, see Poole and Rosenthal (1997).

¹⁰ Speakers' scores are not included in Poole and Rosenthal's results for prior congresses.

Nominate scores which they interpret as indicating location along a standard liberal/conservative continuum, indicate that the Speakers scores fall closer to the party median than the congressional median.

Table 3.1: Speaker Vote Score Relative to Congressional and Party Medians

Congress	Congressional Median	Majority Median	Speaker Score	Distance ¹¹
105 th	0.210	0.450	0.470 (Gingrich)	11
104 th	0.222	0.430	0.448 (Gingrich)	15
103 rd	-0.120	-0.280	-0.320 (Foley)	8
102 nd	-0.103	-0.270	-0.313 (Foley)	11
101 st	-0.080	-0.280	-0.306 (Foley)	11

While such spatial evidence is not conclusive, it at least suggests that the Speaker's own preferences lie closer to the party median than the congressional median.¹² Although the divergence of the Speaker from the party median is small, the question could be raised as to why there is any divergence at all, if the preceding model accurately depicts the institutional reality of the House. Perhaps, on the margin, there are

¹¹ As measured by the number of congressmen between the speaker and the party median.

¹² Because of the limitations of Poole and Rosenthal's scoring system, it is not possible to extend this analysis to previous speakers, but using information for Speaker Wright's voting record for the 99th congress (the term before he was named Speaker) indicates that he too was located closer to his party's median than the congressional median. The same analysis for Tip O'Neill generated the same conclusion.

personality characteristics that are important with respect to Speaker selection. Further, although Poole and Rosenthal's scores are rigorously justified, they are likely to measure ideology with some error. But these spatial results at least suggest the value of further investigation.

B. The Data

The dependent variable to be examined is the percentage of total minority party proposals¹³ (including public bills, amendments, and private bills) that actually receive some legislative or executive action subsequent to being assigned to a House committee. This action would most likely include being reported from the committee to the House.

The data were collected for the 96 through 105 Congresses (1979-1998).¹⁴ Data for previous Congresses were not used because of the existence of different House rules prior to the late 1970s. These rules significantly limited the ability of representatives to cosponsor legislation and led to a situation where many House members each would submit virtually identical bills, presumably because there exists some non-instrumental value of proposing legislation to the politicians.

If the dependent variable were collected for these years as well, there would be a discontinuity between the two sub-samples. In the earlier years, even if the proposal

¹³ Proposals made by third party or independent representatives were counted among the minority party proposals.

¹⁴ Source of Legislative Data: THOMAS Legislative Information on the Internet; site maintained by the United States Library of Congress (thomas.loc.gov/home/bdquery.html).

were supported by a Speaker, there would be no benefit to letting multiple copies of the same proposal survive. In fact, it would be desirable to kill all but one copy, but this would obviously not represent any true agenda manipulation. During the period covered by the sample, co-sponsorship rules were much more liberal and a significant decrease in the number of proposals introduced was witnessed.^{15,16}

The unit of observation chosen for the dependent variable was per congressional session for each House committee. The proposals were divided by committee to whose jurisdiction they were assigned in order to examine the individual effects of each committee. It is not unreasonable to expect some variation among the committees with respect to proposal killing. Perhaps certain issues are seen as more important and, thus, minority party proposals addressing those issues are killed more frequently. This variation was controlled for using dummy variables for each committee that existed during the sample time frame. Because these effects are not of interest for the model but merely represented nuisance effects, no effort was made to combine the effects of committees that, while granted basically the same policy jurisdiction, had different names in different congresses.¹⁷

¹⁵ There were 7,459 total measures introduced in the House during the first session of the 96th Congress, compared with more than 12,000 in the first session of the 95th Congress.

¹⁶ Source: Resume of Congressional Activity (thomas.loc.gov/resume/resume.html).

¹⁷ The committees that existed during the time of the sample were: Administration; Agriculture; Appropriations; Armed Services; Banking and Financial Services; Banking, Finance and Urban Affairs; Budget; Commerce; District of Columbia; Economic and Educational Opportunities; Education and Labor; Education and the Workforce; Energy and Commerce; Foreign Affairs; Government Operations;

Additional nuisance parameters estimated involved the effect of the House majority party's position in the Senate, the President's party, and the workload of the House. The position in the Senate was measured as the number of Senate seats held by the House majority party minus the number held by other parties. Potentially, if a party has a strong position in the Senate, the House Speaker might be more willing to allow a proposal to proceed even if it is likely to defeat the party median's preferred position if there is a good chance the Senate would subsequently reject the proposal. Along the same lines, if a majority party president is likely to veto a given minority party proposed bill, there is little harm in allowing it to survive through the congressional stage. In effect, the Speaker would be relying on the Senate and the President to kill the legislation.

House workload was measured in total pieces of legislation introduced during a given session of Congress. If the aforementioned expediency motive affects this process, it is plausible that the dependent variable might depend on the total amount of legislation to be processed. If there is a great deal of legislation introduced, perhaps, to focus on its

Government Reform and Oversight; Intelligence; Interior and Insular Affairs; International Relations; Interstate and Foreign Commerce; Judiciary; Merchant Marine and Fisheries; National Security; Natural Resources; Oversight; Post Office and Civil Service; Public Works and Transportation; Resources; Rules; Science; Science, Space, and Technology; Science and Technology; Small Business; Standards of Official Conduct; Transportation and Infrastructure; Veterans' Affairs; Ways and Means. The Committee on Committees was deleted from the sample because there were no minority party proposals introduced in its jurisdiction during the single Congress in which it existed within this sample (96th Congress).

own legislation, the Speaker deems it necessary to kill much of the minority party legislation, or something to that effect.

The independent variable of interest is the number of House seats held by the majority party.¹⁸ During the 104th and 105th Congresses, the Republicans held relatively slight majorities, and the Democrats held larger majorities in the 96th through 103rd Houses.

Table 3.2: Majority Size 96th through 105th Congresses

Congress	96 th	97 th	98 th	99 th	100 th	101 st	102 nd	103 rd	104 th	105 th
Republicans	158	192	166	182	177	175	167	176	230	227
Democrats	277	242	269	253	258	260	267	258	204	207
Other	-----	1	-----	-----	-----	-----	1	1	1	1

C. Model Specification

The model was estimated as a fixed effects model where Speaker specific constant terms were estimated for the four Speakers of the House who held their positions during the time period under consideration. For the Republicans, Newt Gingrich served two terms as Speaker (1995-1999). For the Democrats, Thomas Foley served from June 1989 through 1995¹⁹, James Wright held the Speakership for the 100th Congress and for the first five months of the 101st Congress, and Thomas “Tip” O’Neill was Speaker during the balance of the sample.

¹⁸ Again, third party and independent representatives were treated as minority party members.

¹⁹ For the observations occurring during the first session of the 101st Congress, Foley was

indicated as Speaker for the purposes of this study.

Modeling fixed Speaker effects seems like an important thing to do in this context. In the construction of the model, the implication is made that a Speaker can automatically kill any proposal that happens to fall within his kill range. It is unlikely that this process is quite so easy. On a very basic level, perhaps some Speakers are better than others in killing proposals. Also, the structural constraints which limit a Speaker's agenda control power may not be equally effective against all Speakers. In another vein, perhaps some Speakers are less willing to kill proposals either due to personal belief or, maybe, different motives explain the selection of different Speakers and, therefore, affect how a particular Speaker goes about his business.

D. Results

The results of the data analysis²⁰ do not reject the policy motive and the proposal killing model in general. When estimating a simple linear probability model, the expected sign on the size of the majority variable (Seats) was in fact positive and significant at the 90 percent confidence level (0.0005 with a standard error of 0.00028). Of the nuisance parameters, the workload coefficient, while carrying the expected negative sign, proved to be insignificant. And while the Senate Majority (Sen Maj) coefficient was insignificant, its sign did not imply the rationale stated for including it. The coefficient on the president variable was also negative, but it was significant. This

²⁰ The final analysis was undertaken on the basis of 411 observations. Those observations consisting of 0/0 (i.e., committees in which no minority proposal was made for a given year) were eliminated.

presents an interesting puzzle. Although there are reasonable expectations regarding a positive coefficient (the last line of defense argument) or an insignificant effect,²¹ there is no immediately obvious justification for the observed sign.

Table 3.3: Regression Results for Linear Model
 $Min\% = f(Seats, President, Senate, Workload, Speaker)$ using committee fixed effects and generalized least squares estimation.

Variable	Coefficient	t-statistic
R ²	0.30	
Seats	0.0005	1.77
President	-0.0310	-1.95
SenMaj	-0.0001	-0.09
Workload	-0.0000	-0.95
Gingrich	0.1195	3.17
Foley	0.0604	2.16
Wright	0.0803	2.58
O'Neill	0.0600	2.51

If the President indicator is dropped from the specification, the coefficient on Seats increases in magnitude to .0006 with a standard error of .00028.

²¹ For example, if the president tends to be moderate with respect to the nation as a whole, his preferences will be closer to those in the kill range than to the agenda setter's ideal point, so it is necessary to kill moderate proposals to avoid the president signing them into law. However, there is no reason this effect should be greater for a president of your own party, which is indicated by the negative coefficient on the president indicator. Perhaps some sort of presidential protection is occurring. That is, if it is important for a party to secure its core base in some way (e.g., the Religious Right of the Republican Party), it may be in the party's interest to avoid having the president sign a relatively moderate piece of legislation, alienating the extremists. However, this rationale is speculative and unconvincing.

Table 3.4: Regression Results for Linear Model
 $Min\% = f(Seats, Senate, Workload, Speaker)$ using committee fixed effects and generalized least squares estimation.

Variable	Coefficient	t-statistic
R ²	0.29	
Seats	0.0006	2.16
President	-----	-----
SenMaj	-0.0016	-2.22
Workload	-0.0000	-0.77
Gingrich	0.1470	4.19
Foley	0.0786	2.98
Wright	0.1054	3.70
O'Neill	0.0610	2.55

While using the simple linear probability model may be partially justified on practical grounds²² and there is some theoretical justification for it,²³ significant shortcomings attend its use. Specifically, there is no guarantee that predicted values of the *min%* variable would lie within the unit interval. However, the normally used logistic transformation of the data, while solving this problem, forces us to drop any observation equaling 0 or 1. Because there is a preponderance of the former observations and I do not wish to exclude these important observations from my analysis, I respecified the model using the logistic transformation where I added a small constant, 0.0001, to all zero observations as suggested by Greene (2000). With this specification, I achieved qualitatively similar results. The coefficient on Seats was 0.018 with a standard error of

²² Using the normal logistic transformation $\ln [y/(1-y)]$ would disallow consideration of those observations in which no minority proposal came to a vote even though these observations would seemingly be important with respect to proposal killing.

²³ See, for example, Judge (1985).

0.01. The president indicator again was significantly negative. Also, the t-statistic on the Seats variable again rose when the President indicator was dropped.

Table 3.5: Regression Results for Log Odds Ratio
 $Min\% = f(Seats, President, Senate, Workload, Speaker)$ using committee fixed effects and generalized least squares estimation on the ln odds ratio transformation

Variable	Coefficient	t-statistic
R ²	0.40	
Seats	0.0176	1.76
President	-1.7020	-3.00
SenMaj	-0.0143	-0.38
Workload	0.0002	2.00
Gingrich	3.5429	2.63
Foley	1.7455	1.75
Wright	2.2894	2.05
O'Neill	1.6889	1.98

Table 3.6: Regression Results for Log Odds Ratio
 $Min\% = f(Seats, Senate, Workload, Speaker)$ using committee fixed effects and generalized least squares estimation on the ln odds ratio transformation

Variable	Coefficient	t-statistic
R ²	0.39	
Seats	0.0231	2.32
President	-----	-----
SenMaj	-0.0691	-2.64
Workload	0.0002	2.28
Gingrich	5.0524	4.00
Foley	2.7438	2.88
Wright	3.6699	3.58
O'Neill	1.7444	2.02

Why Propose?

If the present model does indeed accurately explain the agenda control process in the House, why then would anyone propose legislation that is certain to be killed before it receives a vote, or, if it does make it to a vote, is certain to be defeated? Perhaps an insight into this issue lies in the behavior of legislators prior to the 96th Congress. Before that time, House rules significantly limited the ability to cosponsor legislation. In the face of this restriction, often many different representatives would submit the exact same proposal as their colleagues. Clearly then, there is some non-instrumental value to making proposals. Proposals are not made merely to bring about binding legislation, but, rather, they may be used to generate political capital. If a congressman can show that he proposed legislation important to his constituents, he may be rewarded for such activity even if the proposal was promptly killed. In fact, if legislation favorable to a given set of constituents is routinely killed before a vote, the only concrete way a representative can show he fought for his people is by making doomed proposals because there will be no way to generate a voting record on those issues. This implies that when the kill zone is large, or alternately when the majority party controls a large number of seats, a legislator will propose more legislation.

Of course, publicity related to making a proposal is likely to be a function of how far it gets in the legislative process. Thus, even if his position is to be defeated by the

eventual congressional vote, the legislator would prefer it was not killed. If there is a cost involved to creating a proposal, legislators will make fewer proposals when the kill zone is large. Highlighting the ambiguity of this relationship, an empirical investigation of how many proposals each minority legislator makes is not significantly related to the size of the majority (coefficient of 0.0002 with a standard error of 0.0006). It would be interesting to control for the cost of making a proposal by perhaps measuring the number of pages in each proposal, but these data are not generally available.

Minority Proposals/Minority Seats = $f(\text{Majority Seats}, \text{Senate President}, \text{Workload}, \text{Speaker})$ using committee fixed effects and generalized least squares estimation:

Table 3.7: Relationship Between Minority Proposals and Minority Seats

Variable	Coefficient	t-statistic
R ²	0.66	
Seats	0.0002	0.21
President	-0.0028	-0.06
SenMaj	0.0003	0.11
Workload	0.0001	8.96
Gingrich	-0.1997	-1.87
Foley	-0.1015	-1.28
Wright	-0.1159	-1.31
O'Neill	-0.1131	-1.68

Mechanism to Control the Legislative Agenda Setter

As indicated by the empirical test above, the Speaker tends to use his position to favor legislation that is centrist with respect to his own party only, at the expense of nationally centrist policies. Socially, this may be undesirable. A simple way to avoid this result is to have the Speaker elected in a national election. If he is no longer beholden to his party median for his re-election chances, he can use his agenda control powers to achieve the ends of society's median voter.

Such a change from the present system would lead to a number of positive and some potentially negative consequences. One clear outcome would be a reduction in pork barrel spending. With a national constituency, the Speaker would have little incentive to support projects with focused benefits and diffuse costs.

This centrifugal force of such national elections was noted by Mancur Olson and Martin McGuire in a different context. "The argument here also helps to explain why Presidents in the United States, irrespective of party, seem to have a lesser propensity to favor pork barrel projects and special-interest measures than do members of Congress, again irrespective of party. No President can be re-elected without pleasing a nationally encompassing constituency, but that is not true of the individual member of Congress, nor (given the weakness of political parties in this country) of any large optimizing majority in the Congress (McGuire and Olson 1996)."

Looked at in a different perspective, Gordon Tullock's (1959) celebrated treatment of logrolling described how bargaining among the voting population (or legislators) can lead, and, assuming maximizing behavior, will lead over provision of publicly funded goods. This logrolling depends on the assumption that benefits from public projects are concentrated among relatively few voters, while the costs are diffuse and that voters can act strategically to form majority coalitions. In the proposed system, it is likely that a national constituency is too large to make such coalition formation practical. Since the agenda setter would be beholden to all of these numerous voters, not simply the members of the legislature, the over provision resulting from the coalition's logrolling is not likely to come about. Instead, the more likely result in this system, is adoption of some generally acceptable rules of thumb for provision of these goods.

In concrete terms, the question remains, will this reduction of government action (reduction of pork-barrel projects) really be beneficial to the society in which it occurs. If the bulk of government spending comes in the form of investment in capital, this reduction could be harmful. Thinking about Tullock's example of the up-keep of roads may be instructive. If one subscribes to the notion of Smithian growth (that is, the division of labor and hence efficiency is limited by the extent of the market), economies exhibit generic threshold behavior.²⁴ As linkages (generically infrastructure) increase above a critical level, local markets merge, allowing inefficient resource allocation to be remedied, leading to an acceleration of growth. Presumably, the reduction of government

²⁴ See Kelly (1997).

activity under the proposed system would retard this linkage formation, slowing the route to that threshold level.

However, if government activity is not of this capital accumulating (infrastructure creating) type, and is instead of the consumption type, the reduction of government activity would be beneficial. Barro (1997) has found that the growth rate of per capita GDP for one hundred countries over the periods 1965-1975, 1975-1985, 1985-1990, exhibited a significantly negative relationship with the ratio of government consumption (exclusive of defense and education) to GDP. He estimated the coefficient to be -0.136 (standard error of 0.026). Hence, reducing this sort of government activity leads to unambiguous economic gains.

With these results in mind, one could argue that a country with well-developed infrastructure (e.g. the United States) is likely to be past the threshold level of linkages, and, therefore, Smithian growth has already been exhausted (or nearly exhausted). But developing economies, with their concomitant underdeveloped infrastructures, have yet to reach the critical linkage level, and a reduction in government activity could potentially be harmful, assuming government spending is of the capital investment type.²⁵ These developing economies, however, would still benefit from a reduction in government consumption.

²⁵ One could argue that rational voters would foresee the gains from these linkages and, therefore, support an agenda setter who pushed for infrastructure spending. Thus, only non-investment government activity would be reduced.

From a welfare economics perspective, the national election of the Speaker would lead to a number of attractive properties. As noted by May (1952), the method of simple majority decision is the only always decisive group decision function to exhibit the attributes of anonymity, neutrality, and positive responsiveness. It is quite obvious that the current Speaker selection mechanism is not anonymous in that the preferences of a minority party Congressman certainly do not carry the same weight as those of a majority party member, to say nothing of the preferences of those agents not holding House seats.

If I foreshadow the multi-dimensional situation treated below, the results of Peter Coughlin's (1992) probabilistic voting model suggest that, under certain assumptions, a two candidate election will lead to a determinate result that maximizes either a Nash or a Benthamite social welfare function (depending upon what form voters' utilities take). In a system where only a subset of the society votes, obviously, the social welfare function will only respect the voters' utilities. Hence, a social maximum is not achieved under the non-national Speaker selection system, while it would be achieved under a national election system.

Extension to Multi-Dimensional Policy Space

The question of whether an agenda control model that is restricted to the single dimension policy space context is useful in describing reality is an open one. Although most legislatures, the U.S. Congress included, consider issues that are too complex to fit into this framework completely, Rosenthal and Poole's (1997) influential study presents evidence that over 80 percent of all Congressional Roll Call votes historically can be adequately described along a one-dimensional "liberal/conservative" continuum. However, recent work by Heckman and Snyder (1997) which uses a rigorously justified linear probability model of binary choice, using unobserved attributes suggests that the relevant dimensional space in determining a legislator's voting behavior cannot be characterized by this simple continuum.

If Heckman and Snyder's results are correct, it is necessary to determine whether or not the proposed model of agenda manipulation would imply the same relationship between *%Min* and *Seats* when the assumption of one-dimensional policy space is dropped. Using the "win sets" device that is often employed in the analysis of n -dimensional voting, upon inspection, it is clear that the size of a given win set, $W(x)$, expands as x is less "central" with respect to the ideal points of all the committee members. As x approaches a more central position, $W(x)$ decreases in size. The win set

around x , the agenda setter's favored position, is the effective "kill range." Thus, the implied relationship between $\%Min$ and $Seats$ is the same in higher dimensions.²⁶

This paper developed a simple model of agenda control in one-dimensional issue space in which the agenda setter kills any proposal that would defeat his own favored policy. If the agenda setter is selected by a nationally encompassing constituency, this type of outcome manipulation will be irrelevant to the extent that the agenda setter will favor the median voter's position on all policies. However, if the agenda setter is chosen by a non-representative sub-set of the population, such as the process by which the Speaker of the U.S. House of Representatives is chosen, the resulting legislation will diverge from centrist positions in favor of more extremist policies.

²⁶ This intuition is related to the derivation of the so-called strong point as described in Grofman, Owen, Noviello, and Glazer (1987). The question remains however concerning what the centrality or extremism of an individual actually means in multi-dimensional space. An intuition for this involves what the strong point for the entire congress (the position favored by a generally elected Speaker) would be relative to the strong point for the majority party (the position favored by a Speaker under the current system). The farther the strong point of the majority party is from that of the entire congress, the larger is the space of potential proposals that need to be killed to ensure success of the proposal lying at the majority's strong point. In the limit (i.e., a 100 percent majority) the majority's strong point would coincide with the congressional strong point. In less than complete majorities, this will only occur if the majority party is a completely representative sub-set of the entire congress.

References

References

- Alesina, A. (1987). "Macroeconomic Policy in a Two-Party System as a Repeated Game." *Quarterly Journal of Economics*, 102: 651-678.
- Barro, R. (1997). *Determinants of Economic Growth: A Cross-Country Empirical Study*. Cambridge, MA: The MIT Press.
- Black, D. (1948). "On the Rationale of Group Decision Making." *The Journal of Political Economy*, 56: 23-34.
- Boehm, C. (1993). "Egalitarian Behavior and Reverse Dominance Hierarchy." *Current Anthropology*, 34: 227-254.
- Boehm, C. (1999). *Hierarchy in the Forest: The Evolution of Egalitarian Behavior*. Cambridge, MA: Harvard University Press.
- Bradford, D., Schlieckert, R. and Shore, S. (2000). "The Environmental Kuznets Curve: Exploring a Fresh Specification." NBER Working Paper No. W8001.
- Buchanan, J. and Tullock, G. (1962). *The Calculus of Consent: The Logical Foundations of Constitutional Democracy*. Ann Arbor, MI: University of Michigan Press.
- Congleton, R. (1992). "Political Institutions and Pollution Control." *Review of Economics and Statistics*, 74: 412-421.
- Coughlin, P. (1992). *Probabilistic Voting Theory*. New York: Cambridge University Press.
- Coughlin, P. and Nitzan, S. (1981). "Electoral Outcomes with Probabilistic Voting and Nash Social Welfare Maxima." *Journal of Public Economics*, 15: 113-121.
- Cowen, T. (1992). "Law as a Public Good: The Economics of Anarchy." *Economics and Philosophy*, 8: 249-267.
- Downs, A. (1957). *An Economic Theory of Democracy*. New York: Harper and Row.

Drazen, A. (2000). *Political Economy in Macroeconomics*. Princeton, NJ: Princeton University Press.

Earle, T. (1989). "The Evolution of Chiefdoms." *Current Anthropology*, 30: 84-88.

Earle, T. (1997). *How Chiefs Come to Power: The Political Economy in Prehistory*. Stanford, CA: Stanford University Press.

Gleditsch, N., ed. (1997). *Conflict and the Environment: Proceedings of the NATO Advanced Research Workshop on Conflict and the Environment, Bolkesjo Norway, 11-16 June, 1996*. Dordrecht, Netherlands: Kluwer.

Goldman, M. (1972). "Externalities and the Race for Economic Growth in the USSR: Will the Environment Ever Win?" *Journal of Political Economy*, 80: 314-327.

Goldman, M. (1985). "Economics of Environment and Renewable Resources in Socialist Systems: Russia," in Kneese, A. and Sweeney, J., eds., *Handbook of Natural Resource and Energy Economics*, vol. 2: 725-745.

Greene, W. (2000). *Econometric Analysis*, 4th ed. Upper Saddle River, NJ: Prentice Hall.

Grofman, B., Owen, G., Noviello, N. and Glazer, A. (1987). "Stability and Centrality of Legislative Choice in the Spatial Context." *The American Political Science Review*, 81: 539-553.

Grossman, G. and Helpman, E. (1996). "Electoral Competition and Special Interest Politics." *The Review of Economic Studies*, 63: 265-286.

Grossman, G. and Krueger, A. (1995). "Economic Growth and the Environment." *Quarterly Journal of Economics*, 110: 353-377.

Gurr, T. (1985). "On the Political Consequences of Scarcity and Economic Decline." *International Studies Quarterly*, 29: 51-75.

Hardin, R. (1997). "Economic Theories of the State." *Perspectives on Public Choice: A Handbook*. Mueller, D., ed. New York: Cambridge University Press.

Heckman, J. and Snyder, J. (1997). "Linear Probability Models of the Demand for Attributes with an Empirical Application to Estimating the Preferences of Legislators." *Rand Journal of Economics*, 28: 142-189.

Homer-Dixon, T. (1999). *Environment, Scarcity, and Violence*. Princeton, NJ: Princeton University Press.

- Homer-Dixon, T. and Blitt, J., eds. (1998). *Ecoviolence: Links Among Environment, Population, and Security*. New York: Rowman and Littlefield Publishers, Inc.
- Hubbell, L. and Selden, T. (1994). "Central Planning, Internal Security, and the Environment." *Public Finance Quarterly*, 22: 291-310.
- Huntington, S. (1991). "How Countries Democratize." *Political Science Quarterly*, 106: 579-616.
- Kelly, M. (1997). "The Dynamics of Smithian Growth." *Quarterly Journal of Economics*, 112: 939-964.
- Klick, J. (2001a). "The Disciplined Dictator: Using National Elections to Temper a Legislative Agenda Setter." Unpublished Working Paper available at <http://mason.gmu.edu/~jklick/research.html>
- Klick, J. (2001b). "The Environmentally Friendly Autocrat or It's Easy Being Green." Unpublished Working Paper available at <http://mason.gmu.edu/~jklick/research.html>
- Knauff, B. (1991). "Violence and Sociality in Human Evolution." *Current Anthropology*, 34: 243-244.
- Kuran, T. (1995). *Private Truths, Public Lies: The Social Consequences of Preference Falsification*. Cambridge, MA: Harvard University Press.
- Kuznets, S. (1955). "Economic Growth and Income Inequality." *The American Economic Review*, 45: 1-28.
- Lardner, G. (1997) "Nomination Declared 'Dead,' But Weld Vows to Fight On." *The Washington Post*: September 15.
- Lipset, S. (1959). "Some Social Requisites of Democracy: Economic Development and Political Legitimacy." *American Political Science Review*, 53: 69-105.
- Machiavelli, N. (1513) [1966]. *The Prince*, trans. by Donno, D. New York: Bantam Books.
- Matthews, J. (1989). "Redefining Security." *Foreign Affairs*, 68: 162-177.
- May, K. (1952). "A Set of Independent Necessary and Sufficient Conditions for Simple Majority Decision." *Econometrica*, 20: 680-684.
- McGuire, M. and Olson, M. (1996). "The Economics of Autocracy and Majority Rule: The Invisible Hand and the Use of Force." *Journal of Economic Literature*, 34: 72-96.

- McKelvey, R. (1976). "Intransitivities in Multidimensional Voting Models and Some Implications for Agenda Control." *Journal of Economic Theory* 12: 472-482.
- McKelvey, R. (1979). "General Conditions for Global Intransitivities in Formal Voting Models." *Econometrica*, 47: 1085-1112.
- Minier, J. (2001). "Is Democracy a Normal Good: Evidence from Democratic Movements." *Southern Economic Journal*, 67: 996-1009.
- Middleton, J. and Tait, D., eds. (1958). *Tribes without Rulers: Studies in African Segmentary Systems*. London: Routledge and Kegan Paul.
- Oates, W. and Portney, P. (forthcoming). "Political Economy of Environmental Policy," in Maler, K. and Vincent, J. *Handbook of Environmental Economics*. Amsterdam: Elsevier Science, B.V.
- Olson, M. (1963). "Rapid Growth as a Destabilizing Force." *Journal of Economic History*, 23: 529-552.
- Olson, M. (1965). *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.
- Olson, M. (1982). *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*. New Haven, CT: Yale University Press.
- Olson, M. (1993). "Dictatorship, Democracy, and Development." *The American Political Science Review*, 87: 567-576.
- Olson, M. (2000). *Power and Prosperity: Outgrowing Communist and Capitalist Dictatorships*. New York: Basic Books.
- Persson, T., Roland, G., and Tabellini, G. (1997). "Separation of Powers and Accountability: Towards a Formal Approach to Comparative Politics." *Quarterly Journal of Economics*, 112: 1163-1202.
- Plott, C. (1967). "A Notion of Equilibrium and Its Possibility Under Majority Rule." *The American Economic Review*, 57: 787-806.
- Poole, K. and Rosenthal, H. (1997). *Congress: A Political-Economic History of Roll Call Voting*. New York: Oxford University Press.
- Rasmusen, E. (1989). *Games and Information: An Introduction to Game Theory*, 2nd ed. Malden, MA: Blackwell Publishers, Inc.

- Rosendorff, B. (2001). "Choosing Democracy." *Economics and Politics*, 13: 1-29.
- Schelling, T. (1960). *The Strategy of Conflict*. Cambridge, MA: Harvard University Press.
- Selten, R. (1978). "The Chain-Store Paradox." *Theory and Decision*, 9: 127-159.
- Service, E. (1975). *Origin of the State and Civilization: The Process of Cultural Evolution*. New York: W.W. Norton.
- Shleifer, A. and Vishny, R. (1993). "Corruption." *Quarterly Journal of Economics*, 108: 599-617.
- Simon, J. (1989). "Paradoxically, Population Growth May Actually End Wars." *Journal of Conflict Resolution*, 33: 164-180.
- Snyder, J. (1990). "Campaign Contributions as Investments: The U.S. House of Representatives, 1980-1986." *The Journal of Political Economy*, 98: 1195-1227.
- Sutter, D. (2000). "A Game-Theoretic Model of the Coup D'Etat." *Economics and Politics*, 12: 205-223.
- Torras, M. and Boyce, J. (1998). "Income, Inequality, and Pollution: A Reassessment of the Environmental Kuznets Curve." *Ecological Economics*, 25: 147-160.
- Tullock, G. (1959). "Problems of Majority Voting." *The Journal of Political Economy*, 67: 571-579.
- Tullock, G. (1974). *The Social Dilemma: The Economics of War and Revolution*. Blacksburg, VA: University Publications.
- Tullock, G. (1987). *Autocracy*. Boston: Kluwer Academic Publishers.
- Veyne, P. (1990). *Bread and Circuses: Historical Sociology and Political Pluralism*. London: The Penguin Press.
- Weingast, B. and Marshall, W. (1988). "The Industrial Organization of Congress; or, Why Legislatures, Like Firms, Are Not Organized as Markets." *The Journal of Political Economy*, 96: 132-163.
- Wintrobe, R. (1998). *The Political Economy of Dictatorship*. New York: Cambridge University Press.

World Bank (2000). *World Development Indicators 2000*. Washington, D.C.: The World Bank.

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