

Essays in Political Accountability

by

Gerard Padró i Miquel

B.S., Universitat Pompeu Fabra (2000)
M.Sc., in Econometrics and Mathematical Economics
London School of Economics (2001)

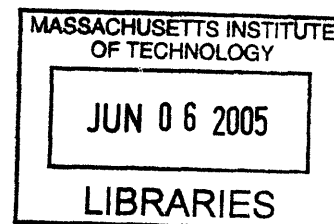
Submitted to the Department of Economics
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 2005



© Gerard Padró i Miquel

The author hereby grants to Massachusetts Institute of Technology permission to
reproduce and
to distribute copies of this thesis document in whole or in part.

Signature of Author
Department of Economics
13 May 2005

Certified by
Daron Acemoglu
Charles P. Kindleberger Professor of Applied Economics
Thesis Supervisor

Certified by
James M. Snyder
Arthur and Ruth Sloan Professor of Economics and Political Science
Thesis Supervisor

Accepted by
Peter Temin
Elisha Gray II Professor of Economics
Chairman, Departmental Committee on Graduate Studies

ARCHIVES

Essays in Political Accountability

by

Gerard Padró i Miquel

Submitted to the Department of Economics
on 13 May 2005, in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Abstract

This thesis is composed by three independent essays on the limits of political accountability.

In the first essay I analyze an extremely stylized model of political agency with two dimensional outcomes. I show that the non-contractible nature of rewards to the agent (the politician) is especially taxing when the voters want to control outcomes in more than one dimension. I compare and contrast this environment with traditional multitasking analyses in the context of the theory of the firm.

The second essay examines why political accountability has failed so miserably in post-colonial, sub-saharan Africa. I provide a theory based on the exploitation of ethnic divisions by self-interested but weak rulers. This cleavages allow the leaders to expropriate resources from the citizenry, included their own ethnic supporters and still remain in power. The model predicts ethnic bias, patronage, inefficient policies and absence of public investment.

The third essay is an empirical analysis of legislative performance in the North Carolina General Assembly. Using a new dataset I am able to show that legislators find their good performance rewarded both within the state legislature and in their electoral careers. These findings have relevance for the discussion on term limits and the theoretical modeling of political agency.

Thesis Supervisor: Daron Acemoglu

Title: Charles P. Kindleberger Professor of Applied Economics

Thesis Supervisor: James M. Snyder

Title: Arthur and Ruth Sloan Professor of Economics and Political Science

Contents

Introduction	11
1 Multitask Political Agency	13
1.1 Introduction	13
1.2 The Model	18
1.2.1 Environment, Timing and Definition of Equilibrium	18
1.2.2 Analysis: The Feasible Set	20
1.3 Asymmetric Outcome Dimensions	28
1.4 The Role of Concavity	32
1.5 Conclusion	36
1.6 Appendix	39
2 The Control of Politicians in Divided Societies: The Politics of Fear	53
2.1 Introduction	53
2.2 The Model	61
2.2.1 The Environment	61
2.2.2 Definition of Equilibrium	65
2.3 Analysis	66
2.4 Discussion and Interpretation	72
2.4.1 Policy Determination and Ethnic Bias	72
2.4.2 Amplification of Kleptocracy	75
2.4.3 The Effect of Institutions on Rent-Seeking	78
2.4.4 Beyond Africa	80

2.5	Extensions	82
2.5.1	On Public Investment	82
2.5.2	On Patterns of Ethnic Violence	86
2.6	Conclusion	89
2.7	Appendix 1: Proof to Proposition 2	91
2.8	Appendix 2: Comparative Statics	94
3	Legislative Effectiveness and Legislative Careers¹	101
3.1	Introduction	101
3.2	Related Literature	104
3.3	Data and Sources	106
3.3.1	A Bit of Background	106
3.3.2	Measuring Legislator Effectiveness	107
3.3.3	Other Variables	109
3.4	The Determinants of Average Effectiveness	111
3.5	Effectiveness and Tenure	113
3.6	Allocating Positions of Power	117
3.7	Effectiveness and Reelection	119
3.8	Discussion and Conclusions	121

¹This chapter is the result of joint work with Professor James M. Snyder.

Acknowledgments

I am especially indebted to the three advisors that have guided me throughout the process of discovering a researcher in me.

Daron Acemoglu has been a constant source of encouragement and demand for rigor. He has invested time and effort into shaping my economic instincts, and has forced me to search for the relevant questions and the appropriate approaches. His door has always been opened to my questions and complaints in matters that ranged well beyond research. I just hope that he is not too disappointed with his final product.

It has been great to be advised by Jim Snyder. His capacity to transmit excitement for this line of work is boundless and it shows when he teaches, advises or writes. I have irrupted in his office many times, and I have always found a listening mind and an insightful comment.

Abhijit Banerjee made me discover development economics. His uncanny ability to ask the crucial questions has immensely influenced many aspects of this thesis.

Many other people helped me focus my interests and gave me the tools to pursue them. I owe all my bibliographical knowledge of Africa to Robert Bates. Iván Werning allowed me to bother him with technical questions and provided deep understanding of the mechanisms at work. Kanchan Chandra taught me ethnic politics.

Many conversations with my peers in the graduate program have undoubtedly increased the quality of my work. I am especially grateful to Raphael Auer, Jessica Cohen, Iván Fernández, Todd Gormley, Veronica Guerrieri, Guy Michaels, Daniel Paravisini and Rubén Segura for their friendship, insight and support.

Pol Antràs has generously offered me his friendship and his mentorship and his guidance has been extremely valuable. Alexis first, and Nicola and Cristiana later have been my family in Somerville, and I am immensely grateful for that.

I thank The Bank of Spain and the Fundación Ramón Areces for providing generous financial support throughout my Ph.D.

*Als meus pares,
a l'Ariadna
i a la seva absència.*

Introduction

The relationship between a politician and his constituency can be characterized as an agency vertical relationship. This conceptualization, known as Political Agency, tries to analyze the extent to which a politician can deviate from the wishes of the citizenry. The idea is that to the extent that the politician values being in office and the citizen has a say in his reelection, the citizen can strategically link his reelection decision to his perceived utility and in this fashion force the politician to take his interest into account, at least to some extent. In this thesis, I examine the limits of this conceptualization of politics, looking for the crucial forces behind some obvious breaches of political accountability.

In the first chapter, entitled “Multitask Political Agency” I start by noting that an important difference between Political Agency analyses and traditional contract theory is that the nature of rewards to the agent is non-contractible. This chapter shows that in a context of multitasking, this non-contractibility makes it difficult to implement interior allocations of effort. As a consequence, the set of implementable effort vectors is not convex. Hence, in polities where more than one dimension is salient and outcomes are complementary for the citizen, provision of incentives is difficult and the politician is able to shirk. This result is derived in the absence of risk-aversion or observability concerns thus adding to the understanding of contracting difficulties in multitask environments.

The second chapter, entitled “The Control of Politicians in Divided Societies: The Politics of Fear” presents a model in which the combination of divided societies and weak institutions in the form of “Personal Rule” regimes creates a failure of accountability of the leadership. As a consequence, the ruler can sustain a kleptocratic regime in which he can steal from the citizens, including his own ethnic supporters, even though he needs them to survive politically.

The model also predicts ethnic bias, extensive use of patronage and absence of investment in infrastructure. Hence, it fits the experience of bad governance, wasteful policies and kleptocracy in post-colonial Africa.

The third chapter of my thesis is the result of joint work with Professor James M. Snyder. In this piece we study an under-utilized source of data on legislative effectiveness, and exploit its panel structure to uncover several interesting patterns. We find that effectiveness rises sharply with tenure, at least for the first few terms, even after controlling for legislators' institutional positions, party affiliation, and other factors. Effectiveness never declines with tenure, even out to nine terms. The increase in effectiveness is not simply due to electoral attrition and selective retirement, but appears to be due to learning-by-doing. We also find evidence that a significant amount of "positive sorting" occurs in the legislature, with highly talented legislators moving more quickly into positions of responsibility and power. Finally, effectiveness has a positive impact on incumbents' electoral success, and on the probability of moving to higher office. These findings have important implications for arguments about term limits, the incumbency advantage, seniority rule and for the theoretical modelling of political accountability.

Chapter 1

Multitask Political Agency

1.1 Introduction

It is very difficult to contest the assertion that the mandate of the chief executive of a country is multidimensional. For instance, in the US, the President is responsible for economic, social and foreign policy, and each of these dimensions involves solving many different problems. On top of that, he is the commander in chief of the army. The citizens care about each and every one of these dimensions, and arguably successes in them are very complementary. Presumably, no citizen would be very happy if the economy performs extremely well but the US is successfully invaded by Canada. What does this evident multidimensionality imply for the political accountability of political leaders?

Starting with Barro (1973) and Ferejohn (1986), a strand of theoretical work analyzes the use of elections as accountability mechanisms from the point of view of agency theory. In the simplest version of this idea, the politician acts as an agent for the citizen, who is the principal. The agent is supposed to carry out an unobservable action that affects the payoff of the citizen. Since the politician has different interests than the principal, the citizen needs to align their incentives. To the extent that the politician values reelection, the citizen can tie her reelection decision to her perceived utility thereby forcing the politician to advance the interests of her principal.

This logic can be perfectly captured by the simplest moral hazard model. The only difference with the typical problem from basic contract theory in the context of the firm is the nature

of the rewards perceived by the agent. The value that a politician puts in being reelected is extremely non-contractible. In particular, the wage politicians receive while in office is typically below their opportunity cost in the labor market. As a consequence, their valuation of office must come either from other pecuniary rewards beyond the control of the citizenry, such as increased wages after their tenure in office, or some intrinsic non-pecuniary motivation¹ in the form of honor, self-aggrandizement or willingness to contribute to the social good, which has been referred to with the term “ego-rents”. It is quite obvious that both these elements are beyond the control of the citizenry. Indeed, starting with Ferejohn (1986), a long list of political agency models take the valuation of office by the politician as given². In these models the utility of a politician in office typically depends on two elements. First, a non-contractible level that is beyond the control of the citizenry. Second, the unobservable action the politician takes while in office, which affects the utility of the citizen, and embeds the conflict of interests. This conflict may take different forms. For instance, in a rent-seeking model, the politician may try to appropriate public resources for her own benefit. On other models, producing the right policy for the citizen needs the exertion of costly effort by the politician. Ideological shirking in office, excess catering to special interests or acceptance of bribes in the process of policy determination are other ways to conceptualize the conflict of interest between politicians and citizens.

A common feature of the models referred to above is their emphasis on the informational advantage of the politician vis-à-vis the citizen. As a consequence, the analysis is typically restricted to one-dimensional policies³. In this paper, I extend an extremely stylized model of political agency to two dimensions of policy. The potential outcome in each dimension is dichotomous, so the one-dimensional problem for the citizen would be straightforward: reelect the politician if the outcome is good, and oust her from office if it is bad. With two dimensions

¹See Diermeier et al. (2004) and Groseclose and Milyo (1999).

²See, for instance Rogoff and Sibert (1988), Austen-Smith and Banks (1989), Rogoff (1990), Banks and Sundaram (1993,1998), Besley and Case (1995), Ashworth (2003), Smart and Sturm (2004) or Snyder and Ting (2004). Most of these papers add an adverse selection component to the underlying moral hazard. Fearon (1999) discusses the relationship between both informational asymmetries. For a stylized version of these models see Persson and Tabellini (2000) or Besley (2004).

³An exception is Meirowitz (2003). His paper analyzes a control problem where the party in power faces a privately known budget constraint and has different spending priorities than the citizen. In that case, the use of mixed strategies allows the citizens to perfectly control the officeholder.

of policy, the optimal voting rule is more complicated. It is obvious that the politician should be reelected if both dimensions are good, and should be ousted if both are bad, but what should the citizen do if one outcome is a success and the other a failure?

The main result of this paper can be stated as follows. In the optimal voting contract, if the citizen wants the politician to exert effort in more than one dimension of policy, she has to sacrifice total effort extraction. The basic intuition is simple. To increase effort provision, the citizen has to increase ex-ante returns to effort, but since she is constrained in the total rewards she can offer, the only way she can do so is by increasing reelection probabilities when there is a mixed result of a success in one dimension and a failure in the other. This introduces a tension: if a single success in one dimension is rewarded too much, the agent will concentrate effort in this one dimension and forget the other one. But on the other hand, if only two successes are rewarded, the agent gives up effort exertion ex-ante because marginal returns are too low. This tension appears in two formal contexts:

First, if the citizen wants to implement an interior allocation of effort⁴ she has to make sure that her voting decisions will induce a concave objective function for the problem of the politician. In the problem of the citizen, this need appears as an extra “concavity constraint” which puts an upper bound to the rewards to a mixed result of success in one dimension and failure in the other. For instance, if the citizen guarantees reelection if dimension A is a success and dimension B is a failure, the politician will for sure ignore dimension B . In other words, to implement an interior allocation of effort there has to be substantial extra reward in having two successes versus having only one. Since the highest reward that can be allocated is sure reelection, single successes can only be rewarded with some positive probability of reelection, strictly below 1. Respecting this constraint thus reduces total probability of reelection ex-ante and, as a consequence, reduces total effort exerted. This reason for reduced effort in the interior is thus a consequence of the second order conditions of the problem of the agent.

Second, there is a reason that works through the first order conditions. If returns to effort are diminishing fast enough in each dimension, the politician avoids concentrating her effort in one dimension because returns at low levels of effort are relatively high. As a consequence, the

⁴I denote by *interior* those allocations of effort in which each dimension receives strictly positive effort. On the contrary, *extreme* allocations of effort are those in which the politician only exerts effort in one dimension.

“concavity constraint” may cease to be binding because the rewards in the mixed success cases are not necessary anymore to induce interior effort and it is enough to reward with sure reelection in the case of two successes and eject the politician from power in any other case. However, even in this case interior effort is reduced. The reason is that rewards in each dimension are tied to the outcome in the other dimension. This increases the variability of rewards in each dimension thus reducing the marginal return to effort. I call this force the “interaction effect.”

These two sides of the problem of multidimensionality do not operate when the citizen wants to implement an allocation of effort that ignores one of the issues. In such circumstance there is no need to keep the problem concave in the two dimensions, because the reaction the voter is aiming for is a corner solution. Moreover, to implement such allocation the citizen promises reelection conditional on a success in just one of the dimensions and this frees the marginal reward from the interaction effect.

Again, the main point of this paper is stated in relative terms: the incentives associated to the electoral system fare much worse when the citizen wants to implement an interior allocation of effort than when it is optimal to focus the politician on one issue. Hence, it is crucial to the decision of the citizen whether the different dimensions of policy are sufficiently complementary in her utility function. If they are complementary enough, the voter cannot live with the knowledge that the politician is only paying attention to one issue, and as a consequence tries to implement an interior allocation of effort. The result is a reduction of total effort exerted by the politician because of the reasons outlined above. As a consequence, we should expect that in countries where more than one dimension of policy are salient, politicians are able to escape accountability. For instance, citizens from countries with latent ethnic conflicts may put emphasis in maintaining stability in addition to promoting economic growth. This could explain some of the cross-country correlations of ethnic fractionalization with bad economic outcomes⁵.

The model presented here is related to the multitasking literature in the theory of organizations, which emphasizes the difficulties of contracting in a multidimensional outcome setting. The seminal work on multitasking agency, Holmström and Milgrom (1991), stressed that whenever these outcomes are observed with different degrees of accuracy by the principal, the optimal

⁵See Alesina and La Ferrara (2003) for a review of this literature.

contract tends to avoid strong incentives in any of them. The mechanism behind this finding relies on the risk aversion of the agents that makes them withdraw from tasks that are observed more noisily and concentrate on tasks where the slope of the reward function is higher. As a consequence, a way to encourage effort in those noisier dimensions is to reduce the incentive associated to other dimensions, and thus weaken incentives all across the outcome space. My model shows that this informational externality across dimensions is not present exclusively in settings with risk averse agents. Even though both principal and agent are risk neutral in my model, adding some observability concerns to one of the outcomes dramatically complicates the implementation of effort in the interior. The concavity constraint affects the probability of reelection in the two mixed cases (a success and a failure) and this links both dimensions of effort. As a result, the deleterious effects of extra noise in one dimension spread to the other one in a way similar to the classical multitasking literature.

Holmström and Milgrom (1991) show a second reason why multitasking agency relationships tend to feature low power of incentives: in a multidimensional setting it makes sense to think of performance measures that are “distorted” from the real objective of the principal. This will also be the case if the outcome in some dimension is not observable, or non-contractible. In these circumstances, increasing incentives causes the agent to withdraw effort from other tasks to concentrate on obtaining a better outcome along the measurable dimension. Since the principal may want to avoid this reallocation of effort, she ends up dampening incentives. As with risk aversion, in my model I abstract from this issue by assuming that the outcomes that the principal observes are exactly what she cares about. Hence, neither of the known reasons that trouble classical multitasking literature (for a paper that clarifies these two motives for reduced incentives, see Baker (2003)) can be behind the effects that I highlight here. The relative loss of effort in interior allocations thus comes from the assumption that the total rewards that the agent can possibly receive are non-contractible and, as a consequence, the agent can only play with the probability that the agent receives them. While this circumstance is especially evident in the context of political agency, it will be important in any situation in which the principal cannot control the total amount of rewards or she has an upper limit on them.

Dixit (1996) presents another theory of incentives in the political arena. In his work, mul-

tidimensionality complicates incentive provision because it is associated with the presence of a variety of principals that care differently about the different dimensions. This common agency setting damps incentives because the agent can play the principals against each other. In a similar vein, Ferejohn (1986) showed that distributional concerns among the citizens will allow the politician to escape accountability. The model that I propose here abstracts from conflicts between principals and shows yet another reason why political agency differs from traditional principal agent analysis: the non-contractibility of rewards is extremely taxing in multitasking environments.

The remainder of the paper is organized as follows. Section II describes the model with linear technology and solves it in detail, paying especial attention to the intuition behind the concavity constraint and the interaction effect, and its consequences. Section III presents an extension of the basic model in which outcome dimensions are asymmetric in their observability and shows how interior implementation is even more complicated. The next section shows that results are not dependent on the assumption of linear technology, and they survive the inclusion of concavity in returns to effort. Finally, section V concludes with some discussion on the meaning of these findings and suggests some avenues for future research. An appendix contains the proofs to all Lemmas and Propositions stated in the text.

1.2 The Model

1.2.1 Environment, Timing and Definition of Equilibrium

There is a representative voter (citizen) with monotonous preferences on a two dimensional outcome vector (O_a, O_b) . Each dimension of the outcome vector can take two values, either it is “good” (G) or it is “bad” (B). An elected official (politician) can exert unobservable effort (e_a, e_b) that affects outcomes in the following way: The probability that O_i (outcome i) is “good” (G) is e_i and the probability that it is “bad” (B) is $1 - e_i$, $e_i \in [0, 1]$, $i \in \{a, b\}$. Hence each effort component only affects a single outcome dimension, and the outcome dimensions are independent. The politician exerts effort at a cost $C(e_a + e_b)$, where $C(0) = 0$, $C' > 0$, $C'' > 0$ and twice continuously differentiable. The politician does not care directly about the outcome vector, but values being in office and securing reelection, which gives her an exogenous

utility R , non-contractible. As a consequence the voter can use her voting decisions to provide incentives to the politician by conditioning her reelection on the realization of the outcome vector through a voting function. Assume further that both the citizen and the politician are risk neutral and the citizen can commit ex-ante to a particular voting function. Note that for the citizen, monotonous preferences on outcomes induce monotonous preferences on the effort vector.

The timing of the model is as follows:

1. The citizen presents a voting function to the politician, $P(O_a, O_b) : [G, B] \times [G, B] \rightarrow [0, 1]$. This function maps the outcome space into the probability of reelection. Since each outcome dimension is dichotomous, the function is completely characterized by four numbers: let P_{ij} be the probability of reelection of the politician in state $(O_a, O_b) = (i, j)$.
2. The politician, upon observing the voting function decides how much effort to exert in each dimension.
3. The outcome vector is realized and the politician is reelected with the probability stated in the voting function for that realization. If she is reelected, she receives utility R .

The strategy of the citizen is, thus, the definition of a voting function, $P_{ij} \in [0, 1], i, j = G, B$ that maximizes her utility given the effort level with which the politician will respond. The strategy of the politician is a selection of effort conditional on the contract offered to her $\sigma(P_{GG}, P_{GB}, P_{BG}, P_{BB}) : [0, 1]^4 \rightarrow [0, 1]^2$ that maximizes her probability of reelection minus her costs of effort in each subgame. The solution concept to apply is thus subgame perfection. There is a proper subgame for each potential voting function that the citizen may choose. The program of the citizen is the following:

$$\begin{aligned}
& \max_{e_a, e_b, P(\cdot, \cdot)} U(O_a, O_b) & (1.1) \\
\text{s.t.} \quad & 0 \leq P_{ij} \leq 1 & i = G, B; j = G, B \\
& 0 \leq e_k \leq 1 & k = a, b \\
(e_a, e_b) \in & \arg \max \{ R[e_a e_b P_{GG} + e_a(1 - e_b)P_{GB} \\
& + (1 - e_a)e_b P_{BG} + (1 - e_a)(1 - e_b)P_{BB}] - C(e_a + e_b) \} & (1.2)
\end{aligned}$$

The last constraint (1.2) states the problem that the politician solves at each subgame. The analysis will show that the implementation of effort allocations in the interior of the unit square is difficult when the set of contracts available is this coarse. To clarify terms, let “extreme allocations” denote effort vectors of the form $(e_a, 0)$, or $(0, e_b)$. Conversely, let “interior allocations” denote any effort vectors for which $e_k > 0, k = a, b$.

There are a number of noteworthy features of the model. Firstly, note that the citizen is given ability to commit to a voting function. Obviously this is not a credible assumption in the political context, but it is used, more or less explicitly in almost all studies of political agency that only involve moral hazard concerns. If instead of a single citizen, there exist a continuum of identical citizens then each one of them is indifferent ex-post in her decision to vote because their probability of being pivotal is zero. Hence, they might as well vote according to the plan. This assumption is made here for comparability of results and to isolate the consequences of lack of contractibility in rewards. Secondly note that, as was stated in the introduction, the citizen can make the voting function conditional exactly on the outcomes she derives utility from. This assumption plus the risk neutrality of principal and agent separates this model from traditional multitasking analysis.

1.2.2 Analysis: The Feasible Set

To proceed with the analysis I first consider carefully constraint (1.2). This constraint states the problem of the agent at each subgame, given the contract she is facing. It is important to note that the objective of the agent can be endogenously non-concave. If the citizen wants to implement interior allocations of effort, she needs to offer a concave objective function to the

politician. To understand the source of this endogenous non-concavity, rewrite the problem of the agent as:

$$\max_{(e_a, e_b) \in [0,1]^2} R[e_a e_b (P_{GG} - P_{GB} - P_{BG} + P_{BB}) + e_a (P_{GB} - P_{BB}) + e_b (P_{BG} - P_{BB}) + P_{BB}] - C(e_a + e_b) \quad (1.3)$$

Note that returns are linear in each dimension of effort, but there is an additional interaction between e_a and e_b . The reason for this is a dimensionality problem: the principal cares about the two dimensions of the outcome space, but can only reward with a one-dimensional object, namely, the total probability of awarding reelection to the politician. As a consequence, the marginal return to each dimension of effort is dependent on a success in the other dimension which is what the interaction captures. The presence of this interaction places a restriction on the set of ballot functions that the principal can use if she wants to implement an interior allocation. The following lemma states that the interaction is crucial for the concavity of the objective function.

Lemma 1 *The objective function in (1.3) features an interior maximum in the unit square only if*

$$P_{GG} - P_{GB} - P_{BG} + P_{BB} \geq 0 \quad (1.4)$$

All lemmas and propositions are proven in the appendix. The intuition is discussed here. Let the constraint in Lemma 1 be denoted the “concavity constraint”. Note that whenever the concavity constraint holds, the interaction between efforts is multiplied by a positive coefficient. In this circumstance a reduction in e_a reduces the marginal return to e_b , and the other way round, which makes the politician willing to move both dimensions of effort in the same direction. On the other hand, when the concavity constraint does not hold, the politician never wants to exert an interior effort vector. The reason is that an increase in effort in one dimension reduces the marginal return in the other one. This gives incentives to reduce effort in the second dimension, which increases marginal returns to the first dimension increasing its effort further. Hence, effort in different dimensions move in different directions and therefore at the optimum one of them must be zero. To see this, assume that the concavity constraint does not hold and the politician is exerting an interior effort vector, $\tilde{e}_a > 0$ and $\tilde{e}_b > 0$. It is easy

to show that she is better off concentrating the same total effort in the dimension that offers better rewards. In particular, assume without loss of generality that $P_{GB} \geq P_{BG}$. Then

$$\begin{aligned} & R[\tilde{e}_a \tilde{e}_b (P_{GG} - P_{GB} - P_{BG} + P_{BB}) + \tilde{e}_a (P_{GB} - P_{BB}) + \tilde{e}_b (P_{BG} - P_{BB}) + P_{BB}] - C(\tilde{e}_a + \tilde{e}_b) \\ < & R(\tilde{e}_a + \tilde{e}_b)(P_{GB} - P_{BB}) - C(\tilde{e}_a + \tilde{e}_b) \end{aligned}$$

Because

$$\tilde{e}_a \tilde{e}_b (P_{GG} - P_{GB} - P_{BG} + P_{BB}) < 0 \leq \tilde{e}_b (P_{GB} - P_{BG})$$

And hence the principal cannot hope to obtain an interior allocation of effort. The constraint (1.4) can be read as an upper bound to $P_{GB} + P_{BG}$, that is, to the rewards offered when one outcome is a success and the other is a failure. Imagine that both are 0. In this extreme case, the politician will only earn reelection if she obtains two successes⁶ and, as a consequence, it is obvious that she would exert an interior effort vector: if she did not, her marginal reward in the dimension in which she would be putting effort would be exactly her probability of obtaining two successes, namely 0. As P_{GB} and/or P_{BG} increase, returns to concentrating one's effort increase because the prospect of leaving one outcome as a sure failure does not condemn the politician to ejection from power. This is why the condition for concavity appears as an upper bound to these "cross-diagonal" rewards: to obtain an interior effort vector, the principal has to make sure that she is not rewarding mixed results (a failure in one dimension and a success in the other) too much.

To proceed with the analysis, I separate program (1.1) in two parts. First, I trace out the set of implementable effort vectors, that is, the set that the restrictions to the program are defining. In other words, I find out the subgames that implement the best effort vectors in the sense that there exist no other voting functions that can implement an effort vector that dominates this particular one in both dimensions. Since the preferences of the principal are monotonous in outcomes, the second step will be simply to find out which effort allocation on the set of best implementable effort vectors suits her better. To trace this set, it is helpful to

⁶It will be shown immediately below that $P_{BB} = 0$ and $P_{GG} = 1$ in any optimal contract for interior effort, as could be expected.

separate the interior from the extremes, as the relevant constraints change. To find the set of interior vectors one has to solve the following program, for $K \in (0, 1)$:

$$\begin{aligned}
& \max_{e_a, e_b, P_{GG}, P_{BB}, P_{BG}, P_{GB}} e_a & (1.5) \\
s.t. & e_b \geq K \\
& 0 \leq P_{ij} \leq 1 \quad i, j = G, B \\
& P_{GG} - P_{GB} - P_{BG} + P_{BB} \geq 0 \\
& R[e_b(P_{GG} - P_{GB} - P_{BG} + P_{BB}) + P_{GB} - P_{BB}] = C'(e_a + e_b) \\
& R[e_a(P_{GG} - P_{GB} - P_{BG} + P_{BB}) + P_{BG} - P_{BB}] = C'(e_a + e_b)
\end{aligned}$$

Note that this program includes the concavity constraint necessary to implement an interior effort vector, as well as the two first order conditions that will determine the effort level at each dimension. Now, the following proposition can be stated:

Proposition 1 *In the implementation of any optimal interior effort vector:*

- i. $P_{GG} = 1$ and $P_{BB} = 0$.*
- ii. The concavity constraint (1.4) is always binding.*

Note that the usual individual rationality constraint is not included in the program. The reason for this is that the politician can always guarantee herself utility RP_{BB} by exerting no effort at all. Moreover, the value of staying in office that the incumbent perceives is not a transfer from the citizens and it is non-contractible. This may help clarify the intuition behind part *i.* in this proposition. Since rewards are bounded above by R , the higher RP_{BB} is, the more difficult it is to give incentives for effort. This is why at the optimum, $P_{BB} = 0$. Conversely, the principal wants to reward the best signal she has of exertion of effort with the highest reward she can give, because it comes at no cost to her but increases incentives for the politician. As a consequence $P_{GG} = 1$.

To understand part *ii.* of proposition 1 note that low values of P_{GB} and P_{BG} have a first order effect in the left hand side of the first order conditions. Keeping them low dramatically reduces the marginal return to effort in each dimension because they are precisely the share of the reward that is independent of a success in the other dimension. In other words, the first order conditions ask for high values of P_{GB} and P_{BG} to increase total effort. Since the concavity constraint takes the form of an upper bound to these rewards, it is always binding. As an example, the first order conditions can be solved in closed form for the case with quadratic costs $C(e_1 + e_2) = \frac{1}{2}(e_1 + e_2)^2$. In this case, when $P_{GB} = P_{BG} = 0$, no effort at all can be extracted from the politician⁷. The reason is that even though the marginal costs are 0 when the politician is exerting no effort, the returns also increase very slowly because they depend exclusively on the product of the two dimensions. From the previous proposition, the set of best implementable interior effort allocations can be identified:

Corollary 1 *The set of best feasible interior effort allocations is implemented by setting $P_{GB} = P_{BG} = \frac{1}{2}$. It is constituted by the effort vectors such that*

$$\frac{1}{2}R = C'(e_a + e_b)$$

and $e_1 > 0, e_2 > 0$.

As it is obvious in the corollary, only the sum of efforts is determined in the frontier. In other words, the set of best feasible interior effort allocation is a segment with negative unit slope. To explain this, note that when the concavity constraint holds with equality, the interaction in the objective function of the agent (1.1) disappears, leaving only the linear terms. In addition, these linear terms have to be rewarded by the same coefficient to prevent the agent from concentrating her effort on the dimension that offers better rewards. This implies that $P_{GB} = P_{BG}$. As a consequence, the politician is indifferent among any vector that respects that sum, and the principal can choose among any point in this line.

Now it is necessary to find the best extreme allocations that are implementable. To implement an extreme allocation of effort the principal does not need to worry about the concavity

⁷The first order conditions can be solved to obtain
 $e_1 = \frac{R[P_{GB} + P_{BG}(R(1 - P_{GB} - P_{BG}) - 1)]}{1 - (R(1 - P_{GB} - P_{BG}) - 1)^2}$ and $e_2 = \frac{R[P_{BG} + P_{GB}(R(1 - P_{GB} - P_{BG}) - 1)]}{1 - (R(1 - P_{GB} - P_{BG}) - 1)^2}$

constraint: when the program is not concave, the absolute maximum for the agent will be for sure in the frontier of the unit square. This makes finding the best extreme allocations very simple:

Lemma 2 *The best extreme allocation $(e_a, 0)$ is obtained with $P_{GB} = 1, P_{BB} = 0$. Conversely, the best extreme allocation $(0, e_b)$ is obtained with $P_{BG} = 1, P_{BB} = 0$.*

The intuition is obvious: if the principal wants the agent to exert maximum e_a , she does so by ensuring that the agent will get maximum rewards whenever outcome a is “good”, and minimum rewards when it is “bad,” irrespective of outcome b . Note that the implementation of $(e_a, 0)$ is independent of P_{BG} . The reason is that the technology in this model implies that $\Pr(O_i = B/e_i = 0) = 1$. If this event did not have probability one (if the exertion of 0 effort did not imply a failure), then the best extreme allocation $(e_a, 0)$ would need the addition of $P_{GG} = 1$, and $P_{BG} = 0$, as will be shown in the next section. The agent is risk neutral, and hence this result has nothing to do with “insuring” the agent against superfluous risk. The right intuition here is that making rewards contingent on outcomes that do not depend on the effort the principal wants to implement can only make things worse⁸. If the principal wants to implement only e_a , O_a is a sufficient statistic, and hence the reward to the agent should be completely independent of O_b . As a consequence, in extreme allocations the model behaves exactly as if it were unidimensional. The following corollary pins down the best extreme implementable effort vector.

Corollary 2 *The set of best extreme allocations is characterized by the pair of points $(e^*, 0)$ and $(0, e^*)$ such that*

$$R = C'(e^*)$$

Corollary 1 and Corollary 2 fully characterize the frontier of the feasible set from which the citizen can choose. The important result of this section is that this frontier is not continuous. Note that along the interior frontier, when $e_b \rightarrow 0, e_a \rightarrow e^*$. Hence, there is a loss of total effort exerted from extreme allocations to interior allocations of effort.

⁸See Holmström (1979)

The underlying reason for this loss is the non-contractibility of R . Hence, it should be obvious that the infinitely repeated version of this game would not solve this problem. In particular, take the subgame perfect equilibrium of the repeated game that gives best payoff to the politician and denote \hat{R} the value of this game for the politician. As long as $\hat{R} \leq C'(1)$, today's game is exactly isomorphic to the one-period game analyzed here. In particular, note that the citizen would assign this best continuation payoff \hat{R} to $(O_a, O_b) = (G, G)$. Therefore the payoff in the mixed success cases has to be somewhere between 0 and \hat{R} . As a consequence, if the citizen wants to implement an interior allocation of effort, faces the same problems in the repeated game than in the one-shot. In other words, repetition does not mitigate the relative difficulty in implementing interior allocations of effort.

This loss implied by the discontinuity of the feasible set can be very significant. To parametrize this loss, it is helpful to normalize R . In particular, assume that $R = C'(1)$. In this case, the extreme allocations induce the politician to exert maximum effort. If it is further assumed that costs are quadratic, it is easy to see that half the total effort is lost from the extremes to the interior. Figure 1 shows the shape of the border of the feasible set for this case.

If the cost function is more convex than quadratic, the loss of total effort in the interior is even bigger.

Two different reasons are behind this loss of total effort. First, in the extremes the marginal return to the dimension of effort that the principal wants to implement is free from the interference of the other one, and hence the full power of the incentives, R , can be made to bear. Second, there is no need to keep the problem globally concave. In other words, in the extreme, there is no real dimensionality problem: the principal wants to implement a unidimensional effort with a unidimensional reward function. Conversely, in the interior the marginal returns to effort are linked, and this reduces effort. To see that the concavity constraint is not the only reason that troubles provision of incentives in the interior, note that even if the concavity constraint were not binding, the first order conditions to program (1.3) do not allow for a symmetric $(\frac{1}{2}, \frac{1}{2})$ allocation of effort. Examination of the closed forms of effort shows that the best symmetric allocation that they allow is $(\frac{1}{3}, \frac{1}{3})$, obtained with $P_{GB} = P_{BG} = 1$. Obviously, this contract would not respect (1.4). The need to keep the problem concave further reduces the best feasible symmetric allocation to $(\frac{1}{4}, \frac{1}{4})$.

In the linear case, the two problems are difficult to distinguish because the concavity constraint is always binding. In section IV, I examine a different technology that allows for cases in which it is only the link between marginal rewards what reduces the interior maximum exertion of effort.

The final step is to find out which point will the citizen choose in this feasible frontier. This will depend on the degree of complementarity that the two dimensions of the outcome space exhibit in the utility function of the voter. This complementarity is crucial because the citizen has to choose between high effort in an extreme or low effort in the interior. Assuming that the citizen is risk neutral, her preferences are completely described by four numbers: the utilities that she associates to each of the four possible ex post states of the world. To normalize and keep the problem symmetric, assume that $U(GG) = 1$, $U(BB) = 0$ and $U(GB) = U(BG) = \gamma$. With this parametrization, γ captures the degree of complementarity of the two outcomes: if $\gamma = 0$, the outcomes are extremely complementary, because a single success does not provide any utility to the citizen. Increasing γ , hence, increases the degree of substitutability. Simple algebra shows that whenever $\gamma > \frac{1}{10}$, the citizen prefers the politician to concentrate on only one task because the loss of efficiency of the interior allocation is too high. The degree of complementarity necessary to obtain an interior allocation is, thus, very high. Obviously, cost functions more convex than quadratic would make the degree of complementarity needed even higher, as the loss in the interior increases. Figure 2 shows the effect of γ on the shape of the indifference curves, and hence on the optimal point chosen by the voter.

This model is easy to analyze and, as a consequence, it is a very convenient model to specialize with simple extensions. The two reasons that cause non-convexity of the feasible set, namely the interaction effect in the rewards function as it shows in the first order conditions and the concavity constraint are intuitive in a world with linear technology. Nevertheless, a close examination of the model, reveals that increasing the concavity of the returns to effort will eventually make the concavity constraint non-binding. Hence, it is important to show that the results presented in this section are not exclusive of the linear case, and that they survive some degree of concavity. The parametrization that will be analyzed in section IV also covers another concern: the fact that the cost function is defined on the sum of the efforts is no doubt restrictive vis-à-vis linearity in the rewards function. Once we allow for nonlinearities in the

rewards function this is not a substantive restriction anymore because extra convexity in the cost in one dimension is equivalent to more rapidly diminishing returns in the rewards function.

1.3 Asymmetric Outcome Dimensions

The assumption of symmetry of dimensions is a good simplifying device, but it clearly misses touch with real contracting situations. Holmström and Milgrom (1991) already points out the fact that when one dimension of effort is observed more noisily than the rest, the ensuing difficulty to incentivize will spread to all other tasks because the agent substitutes across dimensions of effort searching to minimize her exposure to risk. In such a circumstance, the optimal contract features lower incentive power even in the tasks that, were they performed independently, would have been easy to control. This mechanism works through risk aversion and the trade-off between risk and incentive provision that it induces. Since the agent is risk-neutral, this force is absent from the framework proposed here. Nonetheless, the fact that the results in the previous section are obtained because the structure of the contract forces the interaction of both outcomes in the rewards function, suggests that it is possible that noise in one dimension may affect both. This section explores this possibility.

In particular, the kind of asymmetry to be examined here is the one that exists between proactive and preventive dimensions of policy. The former can be evaluated by their results, that most probably appear in a continuous way. On the contrary, preventive dimensions of policy are only salient when there is an imminent threat, or a disaster has already happened. Economic outcomes can be thought of as the usual proactive dimension, and indeed this is the interpretation that unidimensional political agency models tend to favor. Each period, voters can observe what the economic situation is and thus infer the effort exerted by the politician. But the citizens ask for plenty of other things from their governments. In particular, they want absence of disasters, or terrorist attacks, or ethnic upheaval. In these preventive dimensions, “absence of disaster” is obviously a good outcome, but when the citizens observe this outcome they ignore whether the disaster did not happen because the politicians exerted preventive effort that avoided it, or simply because there was no disaster waiting to happen and the politician (and themselves) simply were lucky. Obviously, this problem of observability makes it more

difficult to obtain effort from the politician using reelection as incentive providing mechanism, because the politician can always shirk and wait for the disaster not to happen by itself. The interesting question here is whether the existence of this kind of dimensions makes it also difficult for the citizens to control the economic performance of the politician. In other words, I examine whether there are informational externalities across dimensions.

The environment is the same as in section II, with a slight change in technology. As before, the probability of a good outcome in dimension a is e_a , but assume now that outcome b is observed with noise. In particular, assume that with exogenous probability $1 - \alpha$, the outcome appears as good, no matter the effort exerted by the agent in this dimension. Hence, $\Pr(O_b = G) = 1 - \alpha + \alpha e_b$. The citizen commits to a voting function knowing the existence of this imperfect observability. The agent observes the voting function and decides her effort vector, taking into account her costs $C(e_a + e_b) = \frac{1}{2}(e_a + e_b)^2$. The rest of the assumptions and the definition of strategies remains unchanged.

The problem of the citizen is equal to (1.1), except in the last constraint. With the inclusion of this asymmetry, the problem of the agent can be rewritten as:

$$\max_{(e_a, e_b) \in [0,1]^2} R[\alpha e_a e_b (1 - P_{GB} - P_{BG}) + e_a (1 - P_{BG} + \alpha (P_{GB} + P_{BG} - 1)) + \alpha e_b P_{BG} + P_{BG}] - \frac{1}{2}(e_a + e_b)^2 \quad (1.6)$$

As before, the analysis focusses on tracing out the border of the set of implementable effort vectors. Note that $P_{CG} = 1$ and $P_{BB} = 0$ have already been substituted into the objective function. The reason is the same as in section II: the absence of an individual rationality constraint plus the boundedness of possible rewards implies that in any optimal contract the best signal of effort receives the maximum reward, while absence of success is punished with ejection from power. The concavity constraint takes a familiar form:

Lemma 3 *The objective function of the politician features an interior maximum in the unit square only if*

$$1 - P_{GB} - P_{BG} \geq 0$$

The same reasoning as before applies: when the concavity constraint is not satisfied, the

interaction between the two dimensions of effort is multiplied by a negative coefficient. In this case the marginal reward in one dimension decreases when the effort in the other dimension increases and, as a consequence, the maximum in the unit square has to be in the frontier. The following proposition fully characterizes the feasible set when outcome dimensions present this informational asymmetry:

Proposition 2 *If $R < 1 + \alpha$, the set of best implementable allocations contains:*

- i. The set of best interior allocations is characterized by the effort vectors (e_a, e_b) such that $\frac{\alpha}{1+\alpha}R = e_a + e_b$ and $e_a > 0, e_b > 0$. These are reached by $P_{BG} = \frac{1}{1+\alpha}$, and $P_{GB} = \frac{\alpha}{1+\alpha}$.*
- ii. The best extreme vector in the first dimension takes the form $(e_a^*, 0)$ where $R = e_a^*$, and is reached by $P_{BG} = 0$, and $P_{GB} = 1$.*
- iii. The best extreme vector in the second dimension takes the form $(0, e_b^*)$ where $\alpha R = e_b^*$, and is reached by $P_{BG} = 1$.*

Several points in this proposition are worth noting. First, again, the frontier defined is not continuous, and the set of implementable effort vectors is thus not convex. The loss of total effort from the extremes to the interior is even more pronounced than in Section II. Note that when the citizen wants the politician to concentrate exclusively on the task that is more easily observable, the extreme is defined exactly as before. Hence, the maximum total effort that is attainable in this model is exactly the same. To normalize it, use again $R = 1$. Obviously, the level of e_b implementable by itself is lower than the one for e_a . This can be understood as the direct effect of the extra noise: the lower α is, the more probable is that the good outcome will appear irrespective of e_b and hence the lower the marginal return to e_b . The politician supposed to concentrate on the second dimension, will, as a consequence, reduce her effort. This result is concordant with the usual fact in moral hazard models: an increase in the noise of the measure is replied by a reduction of effort. The difference here is that risk aversion plays no role. It is the fixed size of the prize, R , which forces the optimal effort to contract. Note that, as $\alpha \rightarrow 1$, the two dimensions become more and more similar and so do the extreme efforts implementable.

In the interior, the frontier is again a segment with slope negative 1. The concavity constraint is saturated, which eliminates the interaction from the objective function, and hence the

principal has to make sure that the linear rewards for each dimension are equal if she wants to implement an interior allocation. However, if $P_{BG} = P_{GB}$, returns would not be equalized, because effort in the second dimension is rewarded less often: again, with probability $1 - \alpha$ the outcome does not depend on e_b . Moreover, since two successes are rewarded with sure reelection, the marginal reward to e_a is now higher: there is $1 - \alpha$ probability that a success in the first dimension is enough to secure reelection. Therefore, to equalize marginal returns to effort, it is necessary that $P_{BG} > P_{GB}$. In particular, in the optimum I obtain $\alpha P_{BG} = P_{GB}$. Note that again, as $\alpha \rightarrow 1$ both the optimal contract and the frontier of the implementable set converge to the solution in section II.

The results in Proposition 2 are very stark: as long as the principal decides not to implement any $e_b > 0$, α plays no role. Conversely, the implementation of any vector with $e_b > 0$, comes at a huge cost of total effort. Note that the loss in the interior is significant even with respect to the amount of effort implemented in the extreme where only effort in the noisy action is implemented. The reason for this is that the requirements of the concavity constraint increase with $1 - \alpha$ as well. Even though the constraint itself does not change, the need to equalize returns in both dimensions under $P_{GB} + P_{BG} = 1$ forces the principal to reduce the effective reward for both dimensions. In the benchmark case of quadratic costs $C(e_a + e_b) = \frac{1}{2}(e_a + e_b)^2$, the loss of total effort is easily quantifiable. The interior displays $\frac{\alpha}{1+\alpha}$ less effort than the e_a^* extreme, and $\frac{1}{1+\alpha}$ less effort than the other extreme, e_b^* . More convex cost functions induce even bigger losses of effort in the interior. Figure 3 shows the resulting feasible set.

The analysis thus reveals that, in a similar fashion as in the classical case, increased noise in one dimension complicates the implementation of effort in other dimensions. The relative loss of effort with respect to the case in which only the perfectly observable effort is exerted is now much bigger in the interior. As a consequence, a huge degree of complementarity is needed for the principal to want to implement anything interior. On the other hand, if a bad O_b is really a disaster such as a foreign invasion, this degree of complementarity may be realistic. Note that, in any case, the non-convexity of the feasible set will most probably call for corner solutions. An implication of this is that two countries with the same underlying utility function for their citizens and slight differences in α could provide extremely different incentives to their leaders.

1.4 The Role of Concavity

To examine the robustness of the results in previous sections, this one analyzes a slightly generalized version of the linear model. In previous sections, the concavity constraint was always binding when the citizen was implementing an interior allocation of effort. However, if returns to effort are concave enough, diminishing returns may suffice to induce an interior allocation irrespective of the voting function that is offered. Nonetheless, as was underlined in section II, there is another reason that complicates the implementation of interior effort vectors, namely the link that marginal returns have due to the lack of dimensionality in the rewards. By adding diminishing returns, these two effects can be analyzed separately, because for some levels of concavity, the concavity constraint is not binding but yet interior allocations are worse than extreme ones in terms of total effort.

The environment is the same as in section II. The only change is in the technology that maps effort into probability of success. Assume now that the probability that O_i (outcome i) is “good” (G) is e_i^δ , where $\delta \in R^+$, and the probability that it is “bad” (B) is $1 - e_i^\delta$. The politician exerts effort at a cost $C(e_a + e_b) = \frac{1}{2}(e_a + e_b)^2$. Obviously, $e_i \in [0, 1]$ $i = a, b$. As before, the voter can use her voting decisions to provide incentives to the politician by conditioning her reelection on the realization of the outcome vector through a voting function $P(O_1, O_2) : [G, B] \times [G, B] \rightarrow [0, 1]$. Again, since the politician can always secure utility 0 for herself, it can be stated that $P_{GG} = 1$ and $P_{BB} = 0$ in any optimal voting function. As before, the citizen and the politician are risk neutral and the citizen can commit ex-ante to a particular voting function. Timing and definition of strategies do not change from section II.

Note that the model with quadratic costs in section II is a particular case of this one with $\delta = 1$. With this parametrization, δ captures the degree of diminishing returns to effort. Lower δ means that the transformation from levels of effort to probabilities of success becomes worse and worse as the level of effort increases in that dimension.

The program of the principal is analogous to (1.1), but obviously the objective function of the agent in the last constraint features a different technology. The problem of the agent in

each subgame is now:

$$\max_{(e_a, e_b) \in [0,1]^2} R[e_a^\delta e_b^\delta + e_a^\delta(1 - e_b^\delta)P_{GB} + (1 - e_a^\delta)e_b^\delta P_{BG}] - \frac{1}{2}(e_a + e_b)^2 \quad (1.7)$$

As before, the analysis concentrates in tracing out the set of implementable effort vectors. In particular, I will limit the analysis to compare the total effort that can be extracted from the politician in extreme allocations with the total effort that she will exert in the best symmetric allocation of effort. This is made for expositional simplicity because it gives tighter intuition while reducing the number of parameters and variables to control. To do this comparison, the following lemma characterizes the best extreme implementable vectors.

Lemma 4 *The set of best feasible extreme vectors is characterized by the pair of points $(e^*, 0)$ and $(0, e^*)$ such that*

$$e^* = (\delta R)^{\frac{1}{2-\delta}}$$

Hence, to normalize these points to $(1, 0)$ and $(0, 1)$, it is necessary to set $R = \frac{1}{\delta}$. The faster diminishing returns set in, the higher has to be the reward in order to normalize effort to 1, because the marginal return to effort at high levels is lower. As a consequence, since lower δ implies faster diminishing returns, normalized rewards have to increase as δ decreases. Having normalized R , the discussion about the best symmetric effort vector is clarified: if the vector $(\frac{1}{2}, \frac{1}{2})$ can be implemented, there is no loss of total effort. The following proposition identifies the best symmetric effort allocation as a function of δ . Since symmetric allocations are implemented by symmetric voting functions, let $P = P_{GB} = P_{BG}$.

Proposition 3 *The best implementable symmetric effort vector (\hat{e}, \hat{e}) as function of δ is:*

- i. *If $\delta > \frac{2}{3}$, the concavity constraint is binding and \hat{e} is defined implicitly by $\hat{e}^{2-2\delta}[4\hat{e}^\delta - 2(1 - \delta)] = \delta$. It is implemented by $P = \frac{1}{2-(1-\delta)\hat{e}^{-\delta}}$*
- ii. *If $\delta < \frac{2}{3}$, the concavity constraint is not binding, and \hat{e} is defined by $\hat{e} = (\frac{1}{2})^{\frac{1}{2-2\delta}}$. It is implemented by $P = 0$*

Several points in the previous proposition are worth emphasizing. First, note that quite naturally, the concavity constraint becomes less and less restrictive the more important are

δ	\hat{e}	P
$\frac{2}{3}$	$\frac{\sqrt{2}}{4}$	$\frac{3}{4}$
.7	.349	.728
.9	.298	.587
1	$\frac{1}{4}$	$\frac{1}{2}$
1.1	.171	.472

Table 1.1: Effort and Optimal Contract

diminishing returns. The reason has been hinted at before: if returns to a dimension of effort are diminishing, this by itself gives an incentive to the politician not to concentrate effort. Hence with diminishing returns it is easier for the voter to implement interior allocations of effort. In part *i*. where the constraint is binding, this effect is evident because higher δ implies a more restrictive upper bound to P_{GB} and P_{BG} and, as a consequence, the exertion of less effort in the interior. The reason why the constraint is binding is that returns to effort at low levels are too low, and hence the power of the incentives has to be high to incentivize any exertion of effort. The only way that the citizen has to increase the power of the incentives is increasing P_{GB} and P_{BG} , as the first order conditions recommend, and this makes sure that the concavity constraint will be hit.

Table 1 presents values of optimal symmetric \hat{e} and P , for some values of $\delta \geq \frac{2}{3}$. Again, both \hat{e} and P are decreasing in δ because the concavity constraint becomes more and more stringent. Note that for $\delta = 1$, that is, for the linear case, the result obtained is exactly the same as in the previous section: half of total effort is lost in the interior with respect to extreme allocations. Hence, the results obtained in the simple linear model are not dependent on the assumption of linearity: there is a neighborhood of continuous functions around linearity for which the concavity constraint of the program will be binding and hence it will drive directly how much interior effort the principal can extract from the agent using reelection incentives.

According to part *ii*. in the proposition, when $\delta < \frac{2}{3}$, the constraint is not binding anymore. This comes from the fact that the force of diminishing returns is enough to keep the effort allocation in the interior. Moreover, as the proposition states, in this cases the best way to increase effort is to punish with ejection from power any outcome that is not a success in both dimensions. The reason for this is that the good side of this high level of concavity is that returns are very high at low levels of effort, and hence total probability of reelection, even if it

only happens with two successes, is enough to motivate effort. Recall that in the linear case, the effort in response to such incentive system was 0.

Proposition 3 shows that the interaction effect in the first order conditions can cause a loss in total effort in the interior even when the concavity constraint is not a problem. The fact that when deciding how much effort to put in one dimension, returns are conditional on a success in the other dimension reduces the marginal reward at all levels and, as a consequence, total effort with respect to the extreme. Observe that, according to the solution for \hat{e} in this case, $\hat{e} < \frac{1}{2}$ for $\delta > \frac{1}{2}$. Hence there is a range $\frac{1}{2} < \delta < \frac{2}{3}$ in which even though the concavity constraint is not binding, the principal cannot implement a symmetric allocation in which the politician exerts the same total effort than in the extreme. When $\delta < \frac{1}{2}$, returns to effort are so rapidly diminishing that the interior allocation beats the extreme, overcoming the effect of the interaction in the first order conditions.

The effect of the interaction between dimensions is actually very strong. To see this, ignore the interacting term. In this case, the agent would be actually solving

$$\max_{(e_a, e_b) \in [0,1]^2} R[e_a^\delta P + e_b^\delta P] - \frac{1}{2}(e_a + e_b)^2$$

It is obvious that the solution of this program with diminishing returns, that is, for $\delta < 1$ is interior and symmetric. Since the cost is defined on the sum of efforts and there are diminishing returns to each effort dimension, the optimal reaction is to avoid concentration. Hence for any $\delta < 1$ the citizen would have no problem implementing an interior allocation. It is the presence of the interaction across effort dimensions which complicates keeping the objective function concave. As a consequence it cannot construct a reward system in which the interior is better than the extremes unless the pace of diminishing returns is very fast, $\delta < \frac{1}{2}$. The reason for the presence of this interaction is the different dimensionality of the objective of the citizen and the politician: the citizen cares differently about each dimension with potential complementarities, but the objective of the politician is unidimensional: maximize the probability of reelection.

Note that optimal P exhibits a bang-bang behavior in this non-linear model. The effect of P is to reduce rewards associated to the interaction and to increase those in the independent

terms⁹. When rewards at low levels of effort are small, that is, when δ is high, the optimal strategy is actually to increase P as high as possible because the probability of success in each dimension is small, and hence the probability of two successes is too small to incentivize any effort by itself. As a consequence optimal P rises as much as the concavity constraint allows. On the other hand, when returns at low levels of effort are high, the optimal contract emphasizes returns at the interaction because this is the best way to induce interior allocations of effort in any case, and the product is now high enough to obtain positive effort by itself.

Hence, even though diminishing returns in the mapping from effort to probabilities will eventually eliminate the problem, the fact that inducing interior levels of effort is difficult with this type of contracts is by no means exclusive of the linear case. In each particular application of this rewards system it will be up to discussion whether the production functions are concave enough, but in general, it has been shown that a very high degree of concavity ($\delta < \frac{1}{2}$) is necessary for the principal to be able to implement higher total effort in the symmetric interior than in the extremes. For intermediate values ($\frac{1}{2} < \delta < \frac{2}{3}$), the concavity constraint is not binding yet, but the symmetric allocation is more and more costly in terms of total effort. Finally, for $\delta > \frac{2}{3}$, and including, obviously, linearity and all convex functions, the concavity constraint is binding and driving the level of effort implementable in the interior.

1.5 Conclusion

This analysis of multitask political agency suggests that the electoral system is not a very useful tool to provide incentives in a context of multidimensional mandates, which is the case for virtually all elected offices. Elections are too blunt an instrument to provide incentives conducing to attention to each dimension of policy. As a consequence, narrowing the set of functions that fall under an elected officer's responsibility should help holding him accountable. The attribution of clear objectives on inflation to independent central bankers or the existence of independently elected school boards in the US can be interpreted in this way. In other contexts where the reward systems provide the same kind of contractual environment, such as in bureaucracies, attributions tend to be narrow in scope.

⁹The objective function of the agent can be rewritten as $R[e_a^\delta e_b^\delta (1 - 2P) + e_a^\delta P + e_b^\delta P] - \frac{1}{2}(e_a + e_b)^2$

To the extent that the results presented here are applicable, the analysis suggests that a polity where more than one dimension is salient will face difficulties when trying to implement an interior allocation of effort from the politician. As a consequence the model gives a rationale for corner solutions: unless issues are very complementary, citizens achieve a higher level of utility by forcing their politicians to focus on one issue at a time. It is important to consider what is the relevant interpretation of “issues” in this kind of models. The assumption of a single principal directs the attention to dimensions of the policy space where there is no conflict among citizens, and they can all agree on what is “good”. This is probably why the economic dimension, or absence of corruption, tends to be favored in the literature: a huge majority of the population of a country must agree that stable economic growth is better than stagflation. It obviously cannot be used to assess control along a redistributive policy dimension¹⁰.

This last point may provide an additional reason for why deeply divided societies tend to have bad economic outcomes and non-performing leaders in the economic dimension. Bates (1983) and Horowitz (1985) among others argue that ethnic conflict is fought to control the central government, or to avoid the ethnic antagonists controlling it. The consequence of such a struggle may be that whenever an ethnic group controls a given government, the mandate from this group to its leaders is, at least, strongly two dimensional. As before, every citizen of every country prefers economic growth to economic stagnation, but additionally an empowered ethnic group in a severely divided country wants its government to exert effort in the task of maintaining their position vis-à-vis rival groups. These efforts may be strongly detrimental to the economic performance of the country, but the mechanism highlighted here shows that even if this were not the case, the existence of such a strong second dimension may relax completely the incentives that the leader faces to exert any effort in the economic dimension: any interior allocation may be so costly to sustain in terms of total effort that the citizenry may give up and force the politician to concentrate completely on maintaining the status quo, especially if the threat of losing power is difficult to observe, as in section IV, and it is perceived as a potential disaster for the empowered group. Note that in this case, such a country would be economically underperforming even in the absence of actual fighting among groups. In this model, the worse

¹⁰Ferejohn (1986) already noted that the possibility of control of a politician that uses redistributive tools is very difficult.

situation a citizen can face is a government in a country where the economic dimension has to compete with a more pressing dimension that has worse observability characteristics. The choices of the citizen are between little effort in keeping the status quo, and lots of economic effort that will do no good to her if the position of power is lost. Padró-i-Miquel (2004) exploits this logic in a model where the leader can divert resources to explain the stability of kleptocratic regimes in divides societies.

The effort presented here is a first trial at the implications of multidimensionality on political agency. Other related avenues of research remain untouched. In particular, it would be interesting to study the selection problem in a context where one politician can promise relatively better performance in a particular dimension than the other candidate. If the saliency of issues is stochastic, this program could add insight on government turnover not dependent on actual performance but on perception of the state of the world. In addition, it has been assumed that the two dimensions of effort and outcomes are independent of each other. This assumption is not extreme in the sense that one can think of cases where good outcomes in the two dimensions are positively or negatively correlated. Nonetheless some additional insights could be gained in future research by relaxing this assumption.

1.6 Appendix

Proof to Lemma 1:

The first order conditions of problem (1.3) yield:

$$R[e_b(P_{GG} - P_{GB} - P_{BG} + P_{BB}) + P_{GB} - P_{BB}] - C'(e_a + e_b) = 0$$

$$R[e_a(P_{GG} - P_{GB} - P_{BG} + P_{BB}) + P_{BG} - P_{BB}] - C'(e_a + e_b) = 0$$

Hence, the Hessian of the program is:

$$\begin{pmatrix} -C''(e_a + e_b) & R(P_{GG} - P_{GB} - P_{BG} + P_{BB}) - C''(e_a + e_b) \\ R(P_{GG} - P_{GB} - P_{BG} + P_{BB}) - C''(e_a + e_b) & -C''(e_a + e_b) \end{pmatrix}$$

And the determinant of the Hessian:

$$-R^2(P_{GG} - P_{GB} - P_{BG} + P_{BB})^2 + 2R(P_{GG} - P_{GB} - P_{BG} + P_{BB})C''(e_a + e_b)$$

Which is negative whenever $P_{GG} - P_{GB} - P_{BG} + P_{BB} < 0$. In this case the matrix is indefinite, the first order conditions define a saddle point and the global maxima of the function has to be in an corner of the unit square. If $P_{GG} - P_{GB} - P_{BG} + P_{BB} > 0$, for $C''(e_a + e_b)/R$ high enough, the determinant is positive and the Hessian is negative definite. Hence the program is concave and the first order conditions define a global maximum.

Proof to Proposition 1:

Ignore for the moment restrictions $P_{GG} > 0$, $P_{BB} < 1$ and $0 \leq P_{GB}, P_{BG} \leq 1$. State program (1.5) as follows:

$$\max_{e_a, e_b, P_{GG}, P_{BB}, P_{BG}, P_{GB}} e_a$$

$$\begin{aligned}
s.t. \quad e_a &\geq K && [\nu] \\
1 - P_{GG} &\geq 0 && [\xi] \\
P_{BB} &\geq 0 && [\pi] \\
P_{GG} - P_{GB} - P_{BG} + P_{BB} &\geq 0 && [\delta] \\
R[e_b(P_{GG} - P_{GB} - P_{BG} + P_{BB}) + P_{GB} - P_{BB}] &= C'(e_a + e_b) && [\lambda] \\
R[e_a(P_{GG} - P_{GB} - P_{BG} + P_{BB}) + P_{BG} - P_{BB}] &= C'(e_a + e_b) && [\mu]
\end{aligned}$$

The first order conditions of the lagrangian yield:

$$-\xi + \delta + R(\lambda e_a + \mu e_b) = 0 \quad (1.8)$$

$$\pi + \delta + R(\lambda(e_b - 1) + \mu(e_a - 1)) = 0 \quad (1.9)$$

$$-\delta + R(-\lambda e_b + \mu(1 - e_a)) = 0 \quad (1.10)$$

$$-\delta + R(\lambda(1 - e_b) - \mu e_a) = 0 \quad (1.11)$$

$$1 - \lambda C''(e_a + e_b) + \mu[R(P_{GG} - P_{GB} - P_{BG} + P_{BB}) - C''(e_a + e_b)] = 0 \quad (1.12)$$

$$\nu - \mu C''(e_a + e_b) + \lambda[R(P_{GG} - P_{GB} - P_{BG} + P_{BB}) - C''(e_a + e_b)] = 0 \quad (1.13)$$

Note that the multipliers are stated so that they are weakly positive. Moreover, the multipliers associated to the equality constraints have to be strictly positive. Hence, (1.8) implies that $\xi > 0$, and as a consequence $P_{GG} = 1$. Now assume that $\pi = 0$. Under this assumption, (1.9) and (1.11) imply $-\mu = 0$, which is not possible. As a consequence, $\pi > 0$ and $P_{BB} = 0$.

Equations (1.10) and (1.11) imply that $\lambda = \mu$. But then equation (1.10) can be rewritten as $-\delta + R\mu(1 - e_a - e_b) = 0$. As a consequence, $\delta > 0$ unless $e_a + e_b = 1$, but this is not possible in the interior because the first order conditions do not allow for it as long as $R < 2C'(1)$, that is, whenever rewards are small so that the moral hazard problem is significant. Hence $\delta > 0$ which implies that the concavity constraint is binding.

Note that these conclusions imply that $P_{GG} > 0$ and $P_{BB} < 1$. The concavity constraint is

rewritten as $P_{GB} + P_{BG} = 1$, hence these two parameters are interior. The restrictions ignored at the beginning are, thus, satisfied.

Proof to Lemma 2:

Assume $e_b = 0$. Given this, the agent is maximizing $Re_a(P_{GB} - P_{BB}) - C(e_a)$. The first order condition yields $R(P_{GB} - P_{BB}) = C'(e_a^*)$. Since $C(\cdot)$ is convex, e_a^* is a global maximum. Moreover, the maximum e_a^* is increasing in P_{GB} and decreasing in P_{BB} . Hence the best extreme vector is obtained with $P_{GB} = 1$ and $P_{BB} = 0$.

Now it is needed to verify that $e_b = 0$ when $P_{GB} = 1$ and $P_{BB} = 0$. If $P_{BG} > 0$ the concavity constraint is not satisfied, and the maximum has to be in a corner. But as long as $P_{BG} < 1 = P_{GB}$, the politician concentrates effort in e_a , thus $e_b = 0$. If $P_{BG} = 1 = P_{GB}$, then the politician is indifferent between both corners. Finally, if $P_{BG} = 0$ the first order condition predicts a negative e_b . Hence, $e_b = 0$.

The proof for the other extreme vector follows exactly the same steps.

Proof to Lemma 3:

Follow the steps in the proof to Lemma 1.

Proof to Proposition 2:

Assume first that the concavity constraint is saturated. If this is the case, the first order conditions to (1.6) reduce to:

$$\begin{aligned} R(1 - P_{BG} + \alpha(P_{GB} + P_{BG} - 1)) &= e_a + e_b \\ R\alpha P_{BG} &= e_a + e_b \end{aligned}$$

Since for an interior solution both first order conditions have to hold, the best interior effort vectors when the concavity constraint binds are implemented by:

$$\begin{aligned} R(1 - P_{BG} + \alpha(P_{GB} + P_{BG} - 1)) &= R\alpha P_{BG} \\ P_{GB} + P_{BG} &= 1 \end{aligned}$$

Which solve to $P_{GB} = \frac{\alpha}{1+\alpha}$ and $P_{BG} = \frac{1}{1+\alpha}$. Substitution into the first order conditions

yields $e_a + e_b = \frac{\alpha}{1+\alpha}R$. Now it is needed to show that no allocation with $P_{GB} + P_{BG} < 1$ can do better. To see this, take first order conditions of (1.6) and, since they are linear in e_a and e_b , solve them. This yields:

$$e_a = \frac{R(1 - P_{BG} + \alpha(P_{BG} + P_{GB} - 1) + \alpha P_{BG}(\alpha R(1 - P_{BG} - P_{GB}) - 1))}{1 - (R\alpha(1 - P_{BG} - P_{GB}) - 1)^2} \quad (1.14)$$

$$e_b = \frac{R(\alpha P_{BG} + [1 - P_{BG} + \alpha(P_{BG} + P_{GB} - 1)](\alpha R(1 - P_{BG} - P_{GB}) - 1))}{1 - (R\alpha(1 - P_{BG} - P_{GB}) - 1)^2} \quad (1.15)$$

Now check under which conditions $e_a + e_b > \frac{\alpha}{1+\alpha}R$ with $P_{GB} + P_{BG} < 1$ and $e_a > 0$, $e_b > 0$. Using the previous formulae and some simplification:

$$e_a + e_b = \frac{R[1 - P_{BG} + \alpha(P_{BG} + P_{GB} - 1) + \alpha P_{BG}]}{2 - R\alpha(1 - P_{BG} - P_{GB})}$$

Now, let $S = P_{GB} + P_{BG}$. The condition $e_a + e_b > \frac{\alpha}{1+\alpha}R$ reduces to:

$$\begin{aligned} \frac{1 - P_{BG} + \alpha(S - 1) + \alpha P_{BG}}{2 - R\alpha(1 - S)} &> \frac{\alpha}{1 + \alpha} \\ P_{BG} &< \frac{1 - \alpha + \alpha(1 - S)[R\alpha - 1 - \alpha]}{(1 + \alpha)(1 - \alpha)} \end{aligned}$$

On the other hand, it is needed to ensure that $e_b > 0$. Since the denominator in (1.15) is positive when $P_{GB} + P_{BG} < 1$, it is enough to set the numerator positive. Hence:

$$\begin{aligned} \alpha P_{BG} + [1 - P_{BG} + \alpha(S - 1)](\alpha R(1 - S) - 1) &> 0 \\ P_{BG} &> \frac{1 - \alpha(1 - S)[R + 1] + R\alpha^2(1 - S)^2}{\alpha + 1 - R\alpha(1 - S)} \end{aligned}$$

Hence, for these two conditions to hold at the same time:

$$\frac{1 - \alpha + \alpha(1 - S)[R\alpha - 1 - \alpha]}{(1 + \alpha)(1 - \alpha)} > \frac{1 - \alpha(1 - S)[R + 1] + R\alpha^2(1 - S)^2}{\alpha + 1 - R\alpha(1 - S)}$$

Some algebra reduces this expression to:

$$2(R - 1 - \alpha) + (1 - S)\alpha R(\alpha + 1 - R) > 0$$

Now, if $R < 1 + \alpha$, this condition can be rewritten as:

$$1 - S > \frac{2}{\alpha R} \geq 1$$

Which is obviously not possible because requires it $S < 0$. Hence, in any optimal voting function to implement interior effort vectors, the concavity constraint must be binding.

For the extreme cases, assume first that $e_b = 0$. Then the first order condition of (1.6) yields:

$$e_a = R(1 - P_{BG} + \alpha(P_{GB} + P_{BG} - 1)) = R(1 - \alpha + \alpha P_{GB} - (1 - \alpha)P_{BG})$$

Hence, the best e_a is obtained by $P_{GB} = 1$ and $P_{BG} = 0$, which yields $e_a = R$. From equation (1.15), it is clear that this ballot function induces negative e_b , hence the optimal solution is at the corner $e_b = 0$.

For the other extreme case, assume now that $e_a = 0$. Now the first order condition of (1.6) yields:

$$e_b = R\alpha P_{BG}$$

Hence the best e_b is obtained by $P_{BG} = 1$. Now if $P_{GB} > 0$, the concavity constraint is not satisfied and hence the solution is in a corner. It is very easy to check that for $1 > P_{GB}$ returns to e_b are higher than to e_a and hence the solution must feature $e_a = 0$. If $P_{GB} = 1$ then returns are equal and hence the politician is indifferent between both extremes. Finally if $P_{GB} = 0$ it is easy to check from (1.14) that this ballot function induces negative e_a , hence the optimal solution is at the corner $e_a = 0$.

Proof to Lemma 4:

The first order conditions of program (1.7) yield:

$$R\delta e_a^{\delta-1}[P_{GB} + e_b^\delta(1 - P_{GB} - P_{BG})] - e_a - e_b = 0 \quad (1.16)$$

$$R\delta e_b^{\delta-1}[P_{BG} + e_a^\delta(1 - P_{GB} - P_{BG})] - e_a - e_b = 0 \quad (1.17)$$

Assume that $e_b = 0$. Then, from (1.16), $e_a = (R\delta P_{GB})^{\frac{1}{2-\delta}}$. Hence, $P_{GB} = 1$. Normalizing $R = \frac{1}{\delta}$, it is easy to check that (1.17) implies negative e_b . Hence $e_b = 0$, at the corner. The proof for the other extreme is analogous.

Proof to Proposition 3:

(1.16) and (1.17) imply that whenever $e_a = e_b = e$, $P_{GB} = P_{BG} = P$. Hence a single first order condition remains, and can be rewritten as:

$$P + e^\delta(1 - 2P) - 2e^{2-\delta} = 0$$

The determinant of the Hessian of (1.7), substituting in $e_a = e_b = e$ and $P_{GB} = P_{BG} = P$, is positive whenever:

$$(\delta - 1)e^{\delta-2}[P + e^\delta(1 - 2P)] \leq \delta e^{2(\delta-1)}(1 - 2P)$$

This concavity constraint can be rewritten as:

$$(1 - \delta)e^{-\delta}P + 1 - 2P \geq 0$$

Hence, the program to find the point at which the feasible set crosses the 45° degree line is the following:

$$\begin{aligned}
& \max_{P,e} e \\
s.t. \quad & P + e^\delta(1 - 2P) - 2e^{2-\delta} = 0 & [\lambda] \\
& P \geq 0 & [\mu] \\
& 1 - P \geq 0 & [\varpi] \\
& (1 - \delta)e^{-\delta}P + 1 - 2P \geq 0 & [\gamma]
\end{aligned}$$

For now, assume that the third restriction is never binding. It will be shown later that this is the case. The first order conditions for this program yield:

$$\begin{aligned}
1 + (\delta e^{\delta-1}(1 - 2P) - 2(2 - \delta)e^{1-\delta})\lambda - \delta(1 - \delta)e^{-\delta-1}P\gamma &= 0 \\
(1 - 2e^\delta)\lambda + \mu + \gamma((1 - \delta)e^{-\delta} - 2) &= 0 \tag{1.18}
\end{aligned}$$

Assuming for now that $(1 - \delta)e^{-\delta} - 2 < 0$, as will be shown below, (1.18) implies that whenever $1 - 2e^\delta < 0$, $\mu > 0$, because the program is set so that the Lagrange multipliers are weakly positive. For the same reason, whenever $1 - 2e^\delta > 0$, $\gamma > 0$. Hence, there are two regimes:

- When $1 - 2e^\delta < 0$, $P = 0$, which substituted into the first restriction (foc), yields

$$e = \left(\frac{1}{2}\right)^{\frac{1}{2-2\delta}} \tag{1.19}$$

- When $1 - 2e^\delta > 0$, the first and the fourth constraints are binding. Solving for P in both of them and equalizing yields an implicit expression for e :

$$e^{2-2\delta}[4e^\delta - 2(1 - \delta)] = \delta \tag{1.20}$$

The value of P is $P = \frac{1}{2-(1-\delta)e^{-\delta}}$, simply a rewriting of the fourth constraint.

To find the level of δ at which the regime switches, it suffices to plug (1.19) into (1.20) and

solve for it:

$$\frac{1}{2}\left[4\left(\frac{1}{2}\right)^{\frac{\delta}{2-2\delta}} - 2(1-\delta)\right] > \delta$$
$$\delta < \frac{2}{3}$$

Two details were left above. It remains to be shown that $(1-\delta)e^{-\delta} - 2 < 0$. When $\delta < \frac{2}{3}$, using (1.19) one obtains $e^{-\delta} = 2^{\frac{\delta}{2-2\delta}} < 2$, whenever $\delta < \frac{2}{3}$. As a consequence, since $1-\delta < 1$ in this case, the expression is trivially true. On the other hand, when $\delta > \frac{2}{3}$, one can use (1.20): e and δ are positive, hence it must be the case that $4e^\delta - 2(1-\delta) > 0$. But this expression directly implies what was needed to show. Moreover, it remained to be shown that the restriction $P \leq 1$ is never binding, but this is obvious from the results obtained.

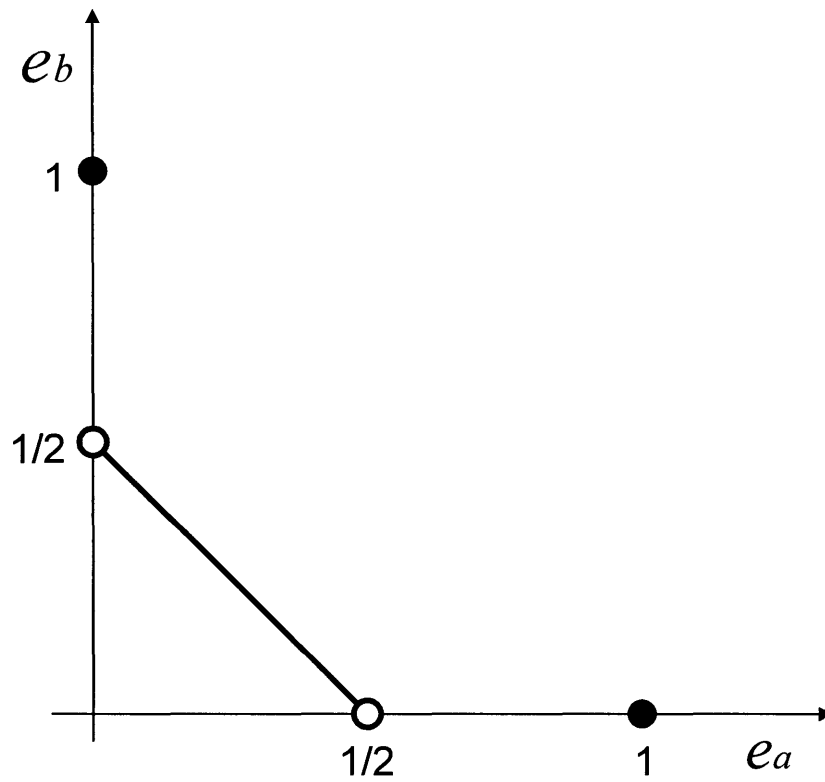


Figure 1-1: Feasible Set with Quadratic Costs

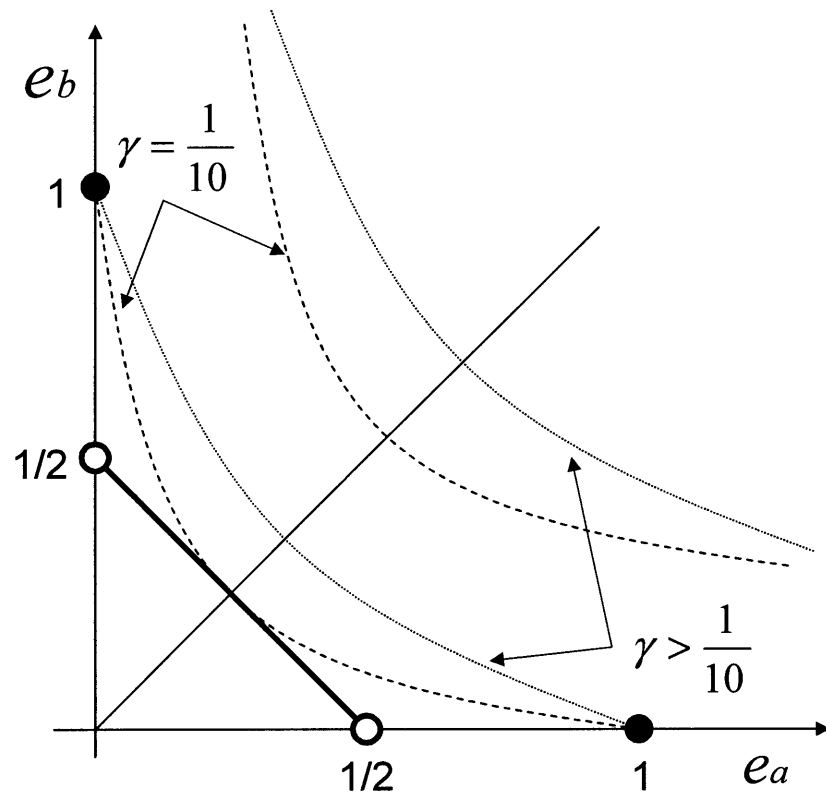


Figure 1-2: Indifference Curve: The Role of Complementarity

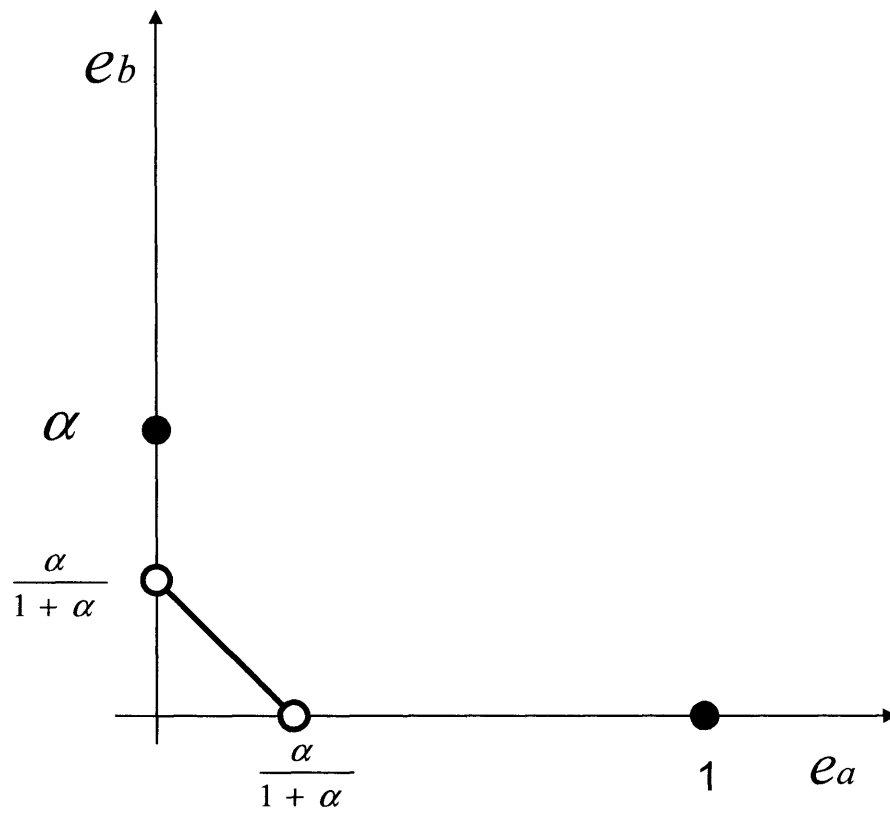


Figure 1-3: Feasible Set with Quadratic Costs and Noise in One Dimension

Bibliography

- [1] ASHWORTH, S. 2002. "Reputations Effects in Electoral Competition." Manuscript, Harvard University.
- [2] AUSTEN-SMITH, D., AND BANKS, J. 1989. "Electoral Accountability and Incumbency." in Ordeshook, ed. *Models of Strategic Choices in Politics*. University of Michigan Press.
- [3] BAKER, G. 1992. "Incentive Contracts and Performance Measurement." *Journal of Political Economy*, 100: 598-614.
- [4] BAKER, G. 2003. "Distortion and Risk in Optimal Incentive Contracts." *Journal of Human Resources*, 37: 728-751.
- [5] BANKS, J., AND SUNDARAM, R. 1993. "Moral Hazard and Adverse Selection in a Model of Repeated Elections." in Barnett et al., eds. *Political Economy: Institutions, Information, Competition and Representation*. Cambridge University Press.
- [6] BANKS, J., AND SUNDARAM, R. 1998. "Optimal Retention in Agency Problems." *Journal of Economic Theory*, 82: 293-323.
- [7] BARRO, R. 1973. "The control of politicians: an economic model." *Public Choice*, 14: 19-42.
- [8] BESLEY, T. 2004. *Principled Agents: Motivation and Incentives in Politics*. Book Manuscript, LSE.
- [9] BESLEY, T. AND CASE, A. 1995. "Incumbent Behavior, Vote Seeking, Tax Setting and Yardstick Competition." *American Economic Review*, 85: 25-45.

- [10] DIERMEIER, D., KEANE, M. AND MERLO, A. 2004. "A Political Economy Model of Congressional Careers." Manuscript, University of Pennsylvania.
- [11] DIXIT, A. 1996. *The Making of Economic Policy: A Transaction Costs Politics Perspective*. MIT Press.
- [12] FEARON, J. 1999. "Electoral Accountability and the Control of Politicians: Selecting Good Types versus Sanctioning Poor Performance." in Przeworski et al., eds. *Democracy, Accountability and Representation*. Cambridge University Press.
- [13] FERREJOHN, J. 1986. "Incumbent Performance and Electoral Control." *Public Choice*, 50: 5-26.
- [14] GROSECLOSE, T. AND MILYO, J. 1999. "Buying the Bums Out: What's the Dollar Value of a Seat in Congress?" Manuscript, Stanford Graduate School of Business.
- [15] HOLMSTROM, B. 1979. "Moral Hazard and Observability" *The Bell Journal of Economics*, 10: 74-91.
- [16] HOLMSTROM, B., AND MILGROM, P. 1991. "Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership and Job Design." *Journal of Law, Economics and Organization*, 7: 24-52.
- [17] MEIROWITZ, A. 2003. "Accountability and Representation in Repeated Elections with Uncertain Policy Constraints." Department of Politics, Princeton University, manuscript.
- [18] PADRÓ I MIQUEL, G. 2004. "The Control of Politicians in Divided Societies: The Politics of Fear." Manuscript. Massachusetts Institute of Technology.
- [19] ROGOFF, K. 1990. "Equilibrium Political Budget Cycles." *The American Economic Review*, 80: 21-36.
- [20] ROGOFF, K. AND SIBERT, A. "Elections and Macroeconomic Policy Cycles." *The Review of Economic Studies*, 55: 1-16.
- [21] PERSSON, T., AND TABELLINI, G. 2000. *Political Economics: Explaining Economic Policy*. MIT Press.

- [22] SMART, M. AND STURM, D. 2004. "Term Limits and Electoral Accountability." Manuscript, University of Toronto.
- [23] SNYDER, J. AND TING, M. 2004. "Interest Groups and The Electoral Control of Politicians." Manuscript, Columbia University.

Chapter 2

The Control of Politicians in Divided Societies: The Politics of Fear

2.1 Introduction

“Very quickly, African independence and socialism turned into one-man dictatorships, characterized by conspicuous consumption by the elites and a "Swiss-bank socialism" that allowed the head of state and his cohort of vampire elites to loot their countries' treasuries (...). Billions of dollars were deposited abroad by the Babangidas, the Bandas, the Barres, the Does, the Kerekous, the Houphouet-Boignies, the Mois, the Mobutus, the Mengistus and many others.”¹

The plundering of African economies has been a systematic and generalized practice of African leaders in the years since their countries achieved independence. The private rewards from such activities have been enormous: several rulers, such as Mobutu, Moi or Houphouet-Boigny, have been estimated to have personal fortunes equivalent to the total external debt accumulated by their countries². Accompanying the blatant enrichment of the leadership, there has been an effort to engage in extensive redistribution of resources in surprisingly inefficient ways. For instance, revenue is raised through costly market manipulations such as oligopolistic

¹Quote from Ayittey (1992:105)

²See Ayittey (1992) or Mbaku (2000) for an account of the extend of thievery.

Marketing Boards for agricultural produce, financial repression and manipulations of the foreign exchange rate. Bloated and inoperant bureaucracies consume a huge share of these public resources and are used as distribution channels for patronage. Excessive and inefficient regulation and redistribution, bureaucratic corruption and outright stealing by the leadership explain a large share of the dismal economic performance of African economies in the last five decades³. Despite such record, the political longevity of kleptocratic and inefficient rulers is remarkable. For instance, Kenya endured Moi's leadership for 24 years, and Houphouet-Boigny's leadership of Ivory Coast ended with his death, after 33 years in power.

From the point of view of the literature on Political Accountability⁴ these facts are puzzling. As long as citizens retain the ability to replace the leader, their interests should be taken into account in the formulation of policies, at least to some extent. Nonetheless, the reality in Africa suggests that this mechanism dramatically fails to work. What explains the incapacity of the citizenry to constrain such blatantly venal leaders?

Obviously, whenever the political survival of the ruler does not depend at all on the acquiescence of the citizenry, political accountability will be absent. Hence, an immediate explanation for the situation in Africa is that coercion and force are used to crush any potential dissent and to keep power. However, African states -colonial, and post-colonial alike- are generally portrayed as very weak states, with limited control over their territories, with weak armies and police forces⁵ and severely limited bureaucracies. This is difficult to reconcile with the idea that such regimes have been able to keep their populations from expressing their discontent at the enrichment of the few and the poverty of the many solely through the use of violence. Moreover casual empiricism suggests that the most successful kleptocratic regimes, such as Zaire, Kenya or Gabon typically did not resort to their armies to maintain stability.

Instead, a better explanation is that these leaders have been able to co-opt large shares

³For the effect of bad policies, see Collier and Gunning (1999), Easterly and Levine (1997) or Easterly (2002). For the effect of political and bureaucratic corruption see, for instance, Mbaku (2000).

⁴The seminal theoretical work on these lines is Barro (1973) and Ferejohn (1986). In these models the politician is portrayed as an agent of a representative citizen. The leader can shirk to the extent that she enjoys some informational advantage, but the citizen places limits on this potential shirking by replacing the ruler when the outcomes are bad.

⁵La Ferrara and Bates (2001) characterize underdeveloped polities by absence of monopoly over the use of violence. For a classical exposition of the characteristics of weak states, see Migdal (1988). See also Herbst (2000), Bates (2001) and Cooper (1999) for a longer discussion on their historical roots.

of their populations into supporting the regime⁶. The patterns of inefficient redistribution can thus be rationalized by the need to obtain support from sizable groups. However, this explanation opens a new set of questions: how is it possible that these leaders were able to amass such exorbitant personal wealth at the same time that they were rewarding a share of their populations sufficiently large to maintain power? Even more intriguing, if the authority of the ruler is cemented by the support of a particular group, how is it possible that internal competition within the group has not dissipated, at least to some extent, the enormous rents that these leaders were accumulating?

This paper develops an argument that explains the absence of accountability together with the policy patterns observed in Africa. The proposed model adds two elements to the paradigmatic political accountability framework: first, the presence of politically relevant ethnic divisions, and second, the characterization of African polities as “Personal Rule”⁷ regimes, a particular type of “weakly institutionalized”⁸ political systems.

Ethnic groups feature two characteristics that are essential for the argument presented here. Firstly, as developed extensively in Bates (1983)⁹, in Africa ethnic groups are the result of competition for the spoils of modernization, and, as a consequence, they serve as exclusion devices. This means that it is very difficult for an individual to change his ethnic definition or allegiance, especially if it is to join the group of “winners.” This phenomenon creates intraethnic loyalty because in the short to medium term, the fate of each individual is linked to the fate of the group. This constrain is true both for the rank-and-file and the elite members of an ethnic group. Secondly, as a consequence of this last point, ethnic links provide a two-way commitment device. The ruler can commit to provide patronage to his ethnic supporters in the future, and supporters can commit to support their leader¹⁰. Moreover, since the strength of personal links inside the group is stronger than across groups, deviations are easier to punish if the group is responsible for it¹¹, making intra-group cooperation easier to sustain.

⁶It is surprising to see many instances where large populations are easily mobilized by the regime: ethnic voting is such an example, but the much darker side of it was present in Rwanda, in 1994.

⁷See Jackson and Rosberg (1982) for a characterization of such regimes.

⁸See Acemoglu, Robinson and Verdier (2004).

⁹Also, see Horowitz (1985).

¹⁰For other instances of ethnic groups as commitment devices see Bates (2000).

¹¹See Fearon and Laitin (1996) and Miguel and Gugerty (2004) for different arguments based on ethnic groups enhancing the capacity to punish deviations by group members.

In a system of Personal Rule, the power of the leader is not bound by the attributions of her office but by her personal power cemented in clientelist links. The personal nature of these links makes the stability of the regime contingent on the identity of the ruler. As a consequence, the process of replacing a leader in power is not controlled by an established political institution, and hence it is uncertain and hardly ever smooth. Jackson and Rosberg (1982), write “a succession [...] alters at least some of the important relationships and standings among leaders and factions- for example, the standing of big men and the clan and ethnic communities they represent” and “The ultimate uncertainty in a system of personal rule lies in the key point of vulnerability: the ruler. [...] If he falls, his relatives, friends, lieutenants, clients and followers also may fall, and the ensuing political disruption may threaten the political peace.” Thus, ousting a leader may initiate a process that involves a potential change in the relative status of different groups in society. The cases of Kenya or Cameroon are good examples of dramatic switches in the standing of different ethnic groups caused by succession.

Ethnic divisions and weak institutions are key for the mechanism that I present. The ruling leader needs the support of her ethnic group to maintain power, because the other ethnic groups prefer their own leaders in equilibrium. To keep the support from her group, the leader has to make sure that her supporters are better off under her rule than under the rule of a leader from another group. However, this is a relative statement because no leader cannot commit not to heavily expropriate the groups she does not belong to. As a consequence, any leader is able to steal from her own kinsmen because they would be even worse off under the leadership of another ethnic group. Supporters are forced to defend the regime because the only way to check their own ruler is to replace her, but in a context of Personal Rule this increases the probability of an ethnic turnover in power, and with it the probability of falling in the excluded status with increased expropriation. This is what I call the Politics of Fear: The worse is your expected situation under a ruler from another group, the more you will allow the ruler from your group to misbehave before withdrawing your support. This threat of domination allows the ruler to expropriate resources even from her own basis of support thus explaining the ability of African leaders to amass such amounts of personal wealth.

This logic of exclusion provides a rationale for the inefficient use of public funds as resources for patronage to the ruler's ethnic group. For this result, an additional assumption needs to be

considered: assume that it is easier to target supporters' income with patronage expenditures than it is with taxation or other means of raising revenue. With this addition, the mechanism works as follows. To the extent that each group's income cannot be targeted specifically by taxation (if taxation is indirect, a group can escape a high rate of taxation by changing its economic activity), the ruler is forced to raise taxation rates across the board if she wants to increase the amount of funds at her reach. To prevent this increase from alienating her supporters, she needs to hand back targeted patronage to her group so that they keep supporting her. Since patronage is only received by a fraction of the population, but allows an increase of taxation to all groups in society, patronage will be overprovided in equilibrium. This outcome is thus consistent both with the coexistence of heavy rates of taxation and inefficient subsidization to supporter groups observed in Africa and with the prevalence of "pork-barrel" politics in ethnically divided societies.

Moreover, to the extent that different ethnic groups devote their efforts to different activities¹² and there exist economic rigidities in their choice of activity, the ruler can use discriminatory taxation against the excluded group. Increased taxation on the activities of the excluded group will not be met by an immediate abandonment of such activities precisely because that group has a comparative advantage in them. In other words, the more a group's source of wealth is sector specific, the less they can arbitrage differences in taxation across sectors. Hence, an economy based in long term cash crop exports such as cocoa or coffee, which involve long-term specific planted capital, will exhibit more venal leaders. The same holds for an economy richer in natural resources. This helps explain the natural resource curse of countries such as Nigeria, or the venality of Kenya's leaders.

With the three assumptions considered together, the amount the leader is able to divert is endogenous to the model because both the gains from replacing her (avoiding her current stealing) and the costs (the increased probability of a ruler from the current opposition ethnic group) are determined in equilibrium by the strategies played by rulers and potential substitutes. This theory uncovers a mechanism of "amplification of kleptocracy": current supporters will accept more stealing from their leader the bigger is the difference between their payoff under

¹²That there is stratification in economic activities across ethnic groups has been long noticed. "Cementing the ethnic division of labor is the preeminent role of ascriptive ties in economic relations in the developing world" in Horowitz (1985).

the current ruler and the payoff under a potential ruler from the opposition group. The more they could lose in the future (i.e. the bigger is the gap), the more their own ruler can steal from them today. This fear is greater the more the potential substitute from the opposition is able to steal in equilibrium. As a consequence, any characteristic of the economy that allows *one* type of ruler to expropriate (for instance, because the income of her group is very activity-specific), will allow *any* type of ruler to misbehave.

Finally, the equilibrium amount of stealing is decreasing in the quality of institutions. In particular, the more the probability of a group staying in power depends on the personal links of the incumbent, the more her supporters are afraid of holding her accountable and hence the heavier the burden of expropriation that they will accept. On the contrary, institutions that make the capture of government by a particular group more difficult, reduce personal dependence of political stability or limit the capacity to target taxation and patronage will reduce kleptocratic excesses.

The implications of the model are thus consistent with an array of cross-country empirical literature that concludes that ethnic fractionalization is associated with poverty and lost opportunities for growth¹³. It results from these analyses that the main cause to link ethnic divisions to bad economic outcomes seems to be different dimensions of bad policy. A panoply of papers¹⁴ highlight the association of high levels of ethnic fractionalization with low provision of public goods such as infrastructure and publicly provided private goods such as schooling or health services. The picture is not only one of bad policies, but one of bad governance: ethnic fractionalization correlates positively with the presence of corruption and “pork barrel politics”¹⁵. A final stylized fact is that the relationship between ethnic fragmentation and negative economic outcomes is diluted at high levels of institutional development¹⁶. In other words,

¹³This literature originates with Mauro (1995) and Easterly and Levine (1997), both papers using the same data to approximate ethnic divisions. The correlation of ethnic fractionalization with low levels of growth survives the use of alternative measures of ethnic divisions, as Alesina et al. (2003) show. This correlation is robust to the use of alternative summary indexes of diversity, such as polarization as in Garcia-Montalvo and Reynal Querol (2002).

¹⁴See Easterly and Levine (1997), Alesina et al. (1999),(2003) among others.

¹⁵For the negative relationship of ethnic fractionalization with different indicators of civil liberties, electoral rights and democratic politics see Barro (1999) and Aghion, Alesina and Trebbi (2004). Mauro (1995), Alesina et. al (2003) among others show the positive relationship between fractionalization and different measures of corruption, bureaucratic inefficiency and absence of rule of law.

¹⁶See Collier (2000), Easterly (2001) and Alesina and La Ferrara (2003).

ethnic divisions are more costly whenever institutions are weak¹⁷.

The early work of Ferejohn (1986) already suggested that distributional concerns among the citizenry could weaken accountability. In his intuition, different groups compete to be included in the winning coalition of the ruler, thus bidding away all the rents. The nature of my mechanism is very different: a ruler is tied to her group, but the prospect of future exclusion forces supporters to defend the regime and keep the leader in power.

This paper is a contribution to the literature on political economy of less developed polities. Ellman and Wantchekon (2000), La Ferrara and Bates (2001), Robinson and Verdier (2002), Robinson, Torvik and Verdier (2002) and Robinson and Torvik (2002) present models of electoral competition enriched to capture diverse characteristics of the political game in weakly institutionalized polities. In particular, the presence of ascriptive groups in society, the absence of commitment technology or the capacity to resort to violence are introduced to explain inefficient policy choices and the presence of clientelism. Even though my model is not explicitly electoral, it contributes to this literature by explaining why internal competition within the ruling group cannot dissipate kleptocratic rents even in a repeated game framework.

Other previous formal analyses of weak institutions include Acemoglu and Robinson (2004), Grossman (1991) and Grossman and Noh (1994) among many others. The general approach is to model the leader as maximizing the amount of resources she can extract from the polity subject to the constraint of remaining in power. I depart from previous work by capturing the idea that divided societies provide the opportunity to marginalize and expropriate part of the population, to the extent that weak institutions make it possible. The main mechanism in my paper is close to the work of Bueno de Mesquita et al. (2003) in which selectorate members give support to the current ruler because the challenger cannot commit to provide future benefits. I concentrate on the consequences and particularities of ethnic divisions among the elite and population, and its interactions with non-institutionalized systems of succession.

Acemoglu, Robinson and Verdier (2004) explicitly address the puzzle of the existence of kleptocratic rulers by noting that weak institutions imply that the leader can exacerbate the collective action problem of society. If the collaboration of different groups is needed to replace

¹⁷For a self-contained discussion of the relevant empirical findings as well as a survey of the literature see Alesina and La Ferrara (2003).

the ruler, she can use the existence of ruler-friendly institutions to buy off a pivotal actor and hence remain in power. The authors dub this strategy “divide-and-rule” following a tradition in the Political Science literature. While there is little doubt that collective action problems are important in explaining why autocratic leaders remain in power, my approach emphasizes a different mechanism that does not exclude the previous one, and explains why some groups actually explicitly give support to such kleptocratic leaders. In addition, my model generates inefficiencies along the equilibrium path, a property that Acemoglu et. al (2004) does not feature.

There is a growing formal literature on ethnic conflict¹⁸. Caselli and Coleman (2003) provide a rationale for why conflicts tend to be along ethnic lines: characteristics such as language and skin color allow winners to exclude losers ex-post, hence changing the incentives to escalate conflict ex-ante. The idea of the role of excludability is thus present in their model, but my paper formalizes the idea that the elites are the ones contributing to and benefiting from ethnic divisions, and then explains why the rest of the population follows. To understand this process, it is crucial to separate the citizenry from the leadership, a notion that formal models of group conflict do not tend to pursue¹⁹.

The remainder of the paper is organized as follows. Next section presents the model and the equilibrium concept that will be used. Section III analyzes the model and describes the equilibrium. Section IV contains a discussion on the interpretation of the model and its results, stressing the comparative statics. Section V contains two extensions of the logic of the model. One explains another general pattern of public expenditure in Africa: the preponderance of wages over investment. A corollary on the relevance for ethnic violence is examined as well. Finally, the last section concludes.

¹⁸See, for example, Fearon (1998),(2004) or Gershenson and Grossman (2000).

¹⁹Some papers have appeared that make this distinction: Glaeser (2002) proposes a model in which hate is provided as a quasi-good by self-interested politicians to rational citizens who demand it. De Figueiredo and Weingast (1999) explain widespread violence and the participation of the masses as the reaction to uncertainty about the intentions of other groups and leaders.

2.2 The Model

2.2.1 The Environment

Consider an infinitely repeated economy populated by a continuum of citizens of mass 1. Citizens belong to one of two ethnic groups, A and B . The size of group A is π^A . There are two economic activities, denoted a and b . A group is defined by two distinct sets of characteristics. First, there are some ascriptive characteristics such as skin color (maybe geographical distribution or language) that are identifiable and, for simplicity, impossible to change²⁰. Second, each group possesses a comparative advantage in a different portfolio of economic activities. A group A citizen obtains ω^a per period in activity a . Should she decide to take activity b she would earn $\omega^a - \theta^A$ per period. Symmetrically, a B citizen obtains ω^b in activity b and $\omega^b - \theta^B$ in activity a , per period. θ^i captures the extent to which a group's wealth is specific to a particular activity. For example, if a group obtains its wealth from coffee, it can switch its efforts to growing rice in their fields. Unfortunately, coffee trees are a long term specific investment, and hence putting those lands to another use entails a loss of pre-tax income. In general, a group that is specialized in cash-crops, especially tree crops, has no way to transfer its planted capital to another activity. The same would be true for a group that obtains revenue from natural resources that lie below its territory. On the other hand, θ^i may simply capture the degree to which specialized knowledge is useless in another sector. Finally, a small value of θ^i also captures the possibility that ethnic groups are not differentiated by economic activities. For simplicity, assume that switching is allowed each period. Let $z_t^i = 1$ if group i does not take the activity in which it enjoys comparative advantage in period t . Otherwise $z_t^i = 0$.

There is a state that performs two functions: it taxes economic activities and uses the proceeds to provide benefits to groups.

These benefits might be public goods that are so dependent on taste that only one of the groups enjoys them. The favoured interpretation is that they constitute pure patronage such as the allocation of public resources to the region of a group in the form of "pork barrel" or the granting of lucrative bureaucratic posts (or posts in the army, police, etc.) to members of the favored group. The state is able to discriminate across recipients for public expenditure thanks

²⁰In the spirit of Caselli and Coleman (2003)

to the ascriptive characteristics of groups.

On the other hand, taxes are activity specific because in particularly poor developing countries as in Africa, the absence of a competent bureaucracy forces the governments to raise their revenue from indirect taxation. For instance, the use of Marketing Boards for agricultural products and other manipulations of the pricing system²¹ are pervasive. In the context of the model, I allow taxation to differ across group-activities, but the ability to imperfectly switch activities will put a ceiling on how differently one can tax different sources of wealth. Thus note that the fundamental difference between expenditures and taxation is that patronage can be perfectly targeted to specific groups.

At any point in time, one ethnic group has control of the government. Even though a group has the state nominally captured, real power is exercised by a narrow elite inside the group, and I will call it the Leader. Denote by L^i the leader if she is from group i . In the remainder of the paper, I call the group to which the leader belongs "supporter" group, and the other is denoted "excluded" group for reasons that will become apparent. Each group has an unlimited supply of identical leaders from which to choose.

Denote τ^{ik} the tax level that a leader of group i levies on activity k . Similarly, let η^{ij} be the amount that leader of group i spends on patronage for group j . Obviously $i, j \in \{A, B\}$ and $k \in \{a, b\}$. The amount η^{ij} provides utility $R(\eta^{ij})$ to group j with $R' > 0$, $R'(0) > 1$, $R'' < 0$ and $R(0) = 0$. Group $-j$ receives no utility from η^{ij} .

This economy has two fundamental states, $S_t \in \{A, B\}$, denoting whether power is captured by group A or group B in period t .

The instantaneous utility of a citizen of group A in state S (the expression for B is just symmetric) is thus:

$$C(S, z^A) = (1 - z^A)(\omega^A - \tau^{Sa}) + z^A(\omega^A - \theta^A - \tau^{Sb}) + R(\eta^{SA})$$

where time subscripts have been omitted for notational simplicity.

Both groups have identical preferences represented by $E \sum_{t=0}^{\infty} \delta^t C_t^j$, where C_t^j is the consumption of group j at time t , and δ is the discount factor.

²¹Bates (1981) provides a detailed account of these practices. In addition, Bates (1989) shows that these manipulations are inefficient to the point of contributing to famines.

Even though the leader belongs to group S_t she has self-serving interests. In particular, she wants to maximize the funds that she can divert for her own uses. A leader of group A obtains instantaneous utility (the expression for B is just symmetric) as long as she is in power:

$$U^A = \pi^A(\tau^{Aa} - \eta^{AA}) + (1 - \pi^A)(\tau^{Ab} - \eta^{AB})$$

and discounts future payoffs by δ . The expression assumes that there is no switching in equilibrium. When a leader is not in power, she obtains 0 utility per period.

The weakness of institutions and the importance of ascriptive links is captured in the model by the following assumptions. First, assume that whenever the incumbent leader retains the support of her kin group, she maintains her position with probability $\bar{\gamma}^A$. With probability $1 - \bar{\gamma}^A$ group B is able to dislodge the leader from power and install a B leader even against a united A group. $\bar{\gamma}^A$ might be well above π^A to capture the notion that weakness of institutions and the strength of ethnic links allow for a huge degree of incumbency advantage. This is the sense in which a group might be able to capture power. The unique credible source of support and thus the unique credible promise of future patronage is given by the ruler's ethnic linkage with her own group²².

Second, if the supporters of an incumbent leader decide to subvert the authority of their leader and want to oust her from power, they succeed automatically. Hence the relevant constraint on the rapacious interests of the leader is the need to keep the support of her group. This is the sense in which the position of the leader is weak: she needs the active support of a sizable share of the population to maintain power.

Third, when a leader is ousted from power by her own supporters the state does not perform its functions for that period. Moreover, the group that is not in power will find it easier to use this opportunity to grab power and seat a leader from its ranks. This captures the reality of Personal Rule regimes in which successions are always uncertain matters, resolved in non-institutionalized ways. Thus, I assume that the status of the group in power will change with probability $1 - \underline{\gamma}^S$. $\underline{\gamma}^S$ captures the degree to which the grip on power of group S is

²²The group has to feature two characteristics: firstly, it has to be very costly to change one's identity ex-post. Secondly, the ruler has to be able to commit to use the same basis of support in the future. The experience in Africa and elsewhere suggests that ethnic allegiances possess both features.

solid in independently of the personality of the ruler. In other words, $\bar{\gamma}^S - \underline{\gamma}^S > 0$ captures the importance of “Personal Rule” since it measures the increased stability that retaining the incumbent buys to her supporters.

The timing of each stage game, given state S_t , is the following:

1. Leader L^S announces the policy vector $P_t = \{\tau_t^{Sa}, \tau_t^{Sb}, \eta_t^{SA}, \eta_t^{SB}\}$
2. The citizens of group S_t decide to “subvert,” $s_t = 1$ or not, $s_t = 0$
3. All groups decide to switch activities or not, $z_t^A, z_t^B \in \{0, 1\}$
4. If $s_t = 0$, P_t is implemented and payoffs are realized. Next period starts with $S_{t+1} = S_t$ with probability $\bar{\gamma}^S$ and the state switches with probability $1 - \bar{\gamma}^S$.
5. If $s_t = 1$, the leader is ousted immediately and the “revolt” vector $P_r = \{0, 0, 0, 0\}$ is implemented. With probability $1 - \underline{\gamma}^S$, group S loses power and the next period starts with $S_{t+1} = -S_t$. Otherwise, the next period starts with a new leader from group S .

There are a number of features of the model that are worth stressing. First, note that collective action within a group is not an issue in this model. The focus of the argument is on the forces that allow rents to be appropriated by a weak leader instead of competed away by different elites inside the same group. Adding heterogeneity and a collective action problem would only help the current leader to steal even more, because she would find it easier to disrupt coordination. Second, and in the same spirit, I do not allow the leader access to any repression instrument: if she loses the support of her group, she is replaced at no explicit cost.

Finally, note that no difference is made between democracy and dictatorship in the model. The evidence from Africa shows that democracies have not behaved differently than dictatorships at the time of supporting kleptocracies and corruption²³. In my analysis, the reason is that both types of regimes have been able to play ethnic divisions and patronage networks in exactly the same ways. The analysis will reveal that institutional reform needs to go further than getting people to vote. It has to include effective constraints on the capacity of the leaders to treat ethnic groups differently, and it should include mechanisms directed to smooth intra-group competition.

²³See Assensoh and Alex-Assensoh (2002), Jackson and Rosberg (1982) or Mbaku (2000) among others.

2.2.2 Definition of Equilibrium

The equilibrium concept to be used is (pure strategy) Markov Perfect Equilibrium. In this type of equilibria, strategies can only be contingent on the payoff-relevant state of the world and the prior actions taken within the same period.

As has been described above, the state space of this economy includes only two elements, $\Theta = \{A, B\}$, denoting whether power is captured by group A or group B at the beginning of period t . Denote the state at each period by S_t , where obviously $S_t \in \Theta, \forall t = 0, 1, 2, \dots$. Assume that each group has a set of potential leaders from which replacements will be drawn randomly. Call these two sets of leaders Δ^A and Δ^B . At any point in time, the leader in power is denoted by L^A or L^B depending on the group she was drawn from. Denote by $\sim L^A$ the potential leaders that belong to Δ^A but are not in power currently. $\sim L^B$ is defined symmetrically. The strategy of the current leader L^A is denoted by P^A and it is a four-tuple $\{\tau^{Aa}, \tau^{Ab}, \eta^{AA}, \eta^{AB}\} \in \mathbb{R}_+^4$ when $S_t = A$. When either $S_t = B$ or $S_t = A$ but a leader belongs to $\sim L^A$, her set of strategies is empty. The symmetric definition holds for the strategies of leaders L^B .

The strategy of group A is denoted $\sigma^A(S/P^S)$ and depends on both the state of political capture and the policy vector proposed by the leader. It determines two actions, $\{s^A, z^A\}$ that have been defined above as the decision to subvert and the decision to switch economic activities. If $S_t = A$, $s^A \in \{0, 1\}$, that is, if the leader is from group A , this group can decide to give her support or to subvert her authority. On the other hand, if $S_t = B$, $s^A = \emptyset$. $z^A \in \{0, 1\}$ independently of the state. The symmetric definition holds for the strategy space of citizens of group B .

State transitions work as follows: whenever $s_t^S = 0$, $S_{t+1} = S_t$ with probability $\bar{\gamma}^S$ and the state switches with probability $1 - \bar{\gamma}^S$. If $s_t^S = 1$, that is, if there is subversion, $S_{t+1} = S_t$ with probability $\underline{\gamma}^S$. Denote this transition function $T(\sigma^S, S)$.

A (pure strategy) Markov Perfect Equilibrium for this game is a combination of strategies denoted by $\{\tilde{P}^A, \tilde{P}^B, \tilde{\sigma}^A, \tilde{\sigma}^B\}$ such that all four strategies are best responses to the other three

for all possible states. In particular, consider the following set of Bellman equations:

$$V^A(S) = \max_{\sigma^A} \{C^A(S, \tilde{P}^S, \sigma^A(S/P^S), \tilde{\sigma}^B) + \delta \sum_{S' \in \Theta} V^A(S')T(\sigma^S, S)\} \quad (2.1)$$

$$V^B(S) = \max_{\sigma^B} \{C^B(S, \tilde{P}^S, \sigma^B(S/P^S), \tilde{\sigma}^A) + \delta \sum_{S' \in \Theta} V^B(S')T(\sigma^S, S)\} \quad (2.2)$$

$$W_{L^A}^A(A) = \max_{P^A} \{U^A(P^A, \tilde{\sigma}^A, \tilde{\sigma}^B) + \delta \sum_{S' \in \Theta} W_{\Delta}^A(S')T(\tilde{\sigma}^A(A/P^A), A)\} \quad (2.3)$$

$$W_{L^B}^B(B) = \max_{P^B} \{U^B(P^B, \tilde{\sigma}^B, \tilde{\sigma}^A) + \delta \sum_{S' \in \Theta} W_{\Delta}^B(S')T(\tilde{\sigma}^B(B/P^B), B)\} \quad (2.4)$$

where C^j denotes the consumption of citizen j as a function of the state S and the strategies of the leader in power and both sets of citizens. $V^j(S)$ denotes the value function for citizen j in state S . $W_{L^S}^i(S)$ denotes the value function for leader from group i in state S , when she is the current leader L^S . To complete the definition, note that $W_{\Delta}^A(B)$, $W_{L^A}^A(A)$, $W_{\Delta}^B(A)$ and $W_{L^B}^B(B)$ are completely independent of any decision that the particular leader could take. They only depend on the probability that, in equilibrium, a particular leader will be in power in the future. As a consequence, these are not interesting strategic objects in this game. A Markov Perfect Equilibrium is thus a combination of strategies $\{\tilde{P}^A, \tilde{P}^B, \tilde{\sigma}^A, \tilde{\sigma}^B\}$ such that $\tilde{\sigma}^A$ solves (2.1), $\tilde{\sigma}^B$ solves (2.2), \tilde{P}^A solves (2.3) and \tilde{P}^B solves (2.4).

2.3 Analysis

Assume without loss of generality that $S_t = A$. The equilibrium is characterized by backwards induction within each stage game. I examine first the decision to switch the sector of production. Take B producers first. Note that the decision to switch does not affect continuation utilities, hence only the static difference in payoffs is relevant. After observing the policy vector P_t , they will switch sector only if the loss in wealth is smaller than the difference in taxation. Formally,

$$z_t^B = 1 \quad \text{iff} \quad \omega^b - \tau^{Ab} < \omega^b - \theta^B - \tau^{Aa}$$

Since it is in the interest of the ruler not to allow this switch, which is wasteful, this ability to switch provides an upper bound on the differential taxation that the ruler can levy on group

B. The effective constraint on the ruler will thus be

$$\tau^{Ab} \leq \theta^B + \tau^{Aa} \quad (2.5)$$

The equivalent restriction for group *A* is then

$$\tau^{Aa} \leq \theta^A + \tau^{Ab} \quad (2.6)$$

Obviously, both restrictions cannot be binding at the same time.

I examine now the decision to subvert by *A* supporters. Note that the leader is the first player to act in the stage game. As a consequence, since strategies can only be conditional on the state of the economy, a leader L^A always proposes the same policy vector P^A . Upon observing P^A , if there is no subversion ($s_t = 0$), *A* supporters obtain:

$$\omega^a - \tau^{Aa} + R(\eta^{AA}) + \delta\bar{\gamma}^A V^A(A) + \delta(1 - \bar{\gamma}^A) V^A(B)$$

Alternatively, if they subvert, $s_t = 1$, they expect:

$$\omega^a + \delta\underline{\gamma}^A V^A(A) + \delta(1 - \underline{\gamma}^A) V^A(B)$$

Hence the non-subversion condition reduces to:

$$\tau^{Aa} - R(\eta^{AA}) \leq \delta(\bar{\gamma}^A - \underline{\gamma}^A)(V^A(A) - V^A(B)) \quad (2.7)$$

Note that the ruler will always satisfy this constraint by subgame perfection. Not satisfying it gives her no benefit because in the period she is thrown out she already receives 0 utility, plus she will obtain 0 forevermore, while being in power implies receiving positive rents each period. Hence in any MPE there will never be any ousting of a ruler. Therefore the only possibility of a change of state is the excluded group wresting power away from the supporter group, which happens each period with probability $1 - \bar{\gamma}^S$. In equilibrium the continuation values for

a citizen A can thus be expressed as:

$$\begin{aligned} V^A(A) &= \omega^a - \tau^{Aa} + R(\eta^{AA}) + \delta\bar{\gamma}^A V^A(A) + \delta(1 - \bar{\gamma}^A) V^A(B) \\ V^A(B) &= \omega^a - \tau^{Ba} + R(\eta^{BA}) + \delta\bar{\gamma}^B V^A(B) + \delta(1 - \bar{\gamma}^B) V^A(A) \end{aligned}$$

Solving these equations for $V^A(A) - V^A(B)$ and substituting the resulting expression in (2.7), the no-subversion constraint can be written in terms of the equilibrium value of policy:

$$\tau^{Aa} - R(Z^{AA}) \leq \frac{\delta(\bar{\gamma}^A - \underline{\gamma}^A)}{1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)} [\tilde{\tau}^{Ba} - R(\tilde{\eta}^{BA}) - \tilde{\tau}^{Aa} + R(\tilde{\eta}^{AA})]$$

Where the superscript \sim denotes equilibrium values. For notational simplicity I will denote $\Phi^A = \frac{\delta(\bar{\gamma}^A - \underline{\gamma}^A)}{1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)} [\tilde{\tau}^{Ba} - R(\tilde{\eta}^{BA}) - \tilde{\tau}^{Aa} + R(\tilde{\eta}^{AA})]$. This term summarizes the way in which future equilibrium play affects present decisions. With these ingredients, now I am able to posit the problem of ruler L^A :

$$\max_{\{\tau^{Aa}, \tau^{Ab}, \eta^{AA}, \eta^{AB}\}} \pi^A(\tau_t^{Aa} - \eta_t^{AA}) + (1 - \pi^A)(\tau_t^{Ab} - \eta_t^{AB}) + \delta\bar{\gamma}^A W_{L^A}^A(A) \quad (2.8)$$

$$\begin{aligned} \text{subj.to} \quad \tau^{Ab} &\leq \theta^B + \tau^{Aa} && [\lambda] \\ \tau^{Aa} &\leq \theta^A + \tau^{Ab} && [\nu] \\ \tau^{Aa} - R(\eta^{AA}) &\leq \Phi^A && [\mu] \\ 0 &\leq \eta^{AB} && [\rho] \end{aligned}$$

The ruler thus maximizes her returns per period, conditional on avoiding any wasteful switching and subversion. The first order conditions of this program yield:

$$\pi^A + \lambda - \nu - \mu = 0 \quad (2.9)$$

$$1 - \pi^A - \lambda + \nu = 0 \quad (2.10)$$

$$-\pi^A + \mu R'(\eta^{AA}) = 0 \quad (2.11)$$

$$-(1 - \pi^A) + \rho = 0 \quad (2.12)$$

The first order conditions are simple and easy to interpret. From (2.12) it is obvious that $\eta^{AB} = 0$. The reason is that providing patronage good to the excluded group is costly and yields no benefit, since what is critical is the support from the leader's group. From (2.9) and (2.10) and the fact that λ and ν cannot both be strictly positive at the same time we learn that $\nu = 0$, $\lambda = 1 - \pi^A$ and $\mu = 1$. $\nu = 0$ implies that the second restriction is not saturated. The analysis thus reveals that the ruler endogenously chooses to discriminate against the "excluded" group. Quite intuitively the leader will tax the excluded group as much as she can, that is, to the point in which the first constraint is binding.

Since this first constraint is binding, every dollar that the ruler is able to tax her own supporters is worth more than one dollar for her, because it allows her to increase taxation on the excluded group. Note from (2.11) that μ multiplies the return from the last unit of patronage given to group A . The cost of this last unit is only π^A , but its return is increased taxation from the whole population (because $\mu = 1$). This disparity is the reason for inefficient overprovision of patronage. The mechanism works as follows: the non-subversion constraint is binding and hence an increase in $R(\eta^{AA})$ allows the ruler to increase taxation on her supporters. Since the no-switching constraint is also binding, taxation on the excluded group increases in parallel. Hence, increasing patronage spending on her group allows the ruler to increase revenue raising from the whole population, while a social planner would take into account that only a fraction of the population receives utility from this patronage. This distortion is thus worse the narrower the basis of support of the ruler (the smaller π^A).

Formally, the stage program yields the following solution:

$$\eta^{AB} = 0 \tag{2.13}$$

$$R'(\eta^{AA}) = \pi^A \tag{2.14}$$

$$\tau^{Aa} = \Phi^A + R(\eta^{AA}) \tag{2.15}$$

$$\tau^{Ab} = \theta^B + \Phi^A + R(\eta^{AA}) \tag{2.16}$$

The solution for patronage public goods (2.13) and (2.14) is thus independent of expectations of future play, but this is not the case for the amount of resources that the leader can extract from both groups. In fact, the solution above presents a mapping between future equilibrium play

and current taxation. Remember that, in equilibrium, another symmetric problem is solved by any L^B leader in power. The solution to the program for L^B is:

$$\eta^{BA} = 0$$

$$R'(\eta^{BB}) = 1 - \pi^A$$

$$\tau^{Bb} = \Phi^B + R(\eta^{BB}) \quad (2.17)$$

$$\tau^{Ba} = \theta^A + \Phi^B + R(\eta^{BB}) \quad (2.18)$$

Denote the mapping from expectations to current play $\Gamma(\Phi^A, \Phi^B) = (\tau^{Aa}, \tau^{Ab}, \tau^{Ba}, \tau^{Bb})$, given by (2.15), (2.16), (2.17) and (2.18). Moreover, the definition of Φ^A (and the symmetric definition of Φ^B) provides a mapping from actual play to consistent expectations $\Psi(\tau^{Aa}, \tau^{Ab}, \tau^{Ba}, \tau^{Bb}) = (\Phi^{CA}, \Phi^{CB})$. The equilibrium posits the requirement that these expectations be consistent with future play. In this context this reduces to finding a fixed point of the mapping that relates expectations into themselves: $\Psi(\Gamma(\Phi^A, \Phi^B)) = (\Phi^{CA}, \Phi^{CB})$. Explicitly, this mapping is the following:

$$\begin{aligned} \Phi^{CA} &= \frac{\delta(\bar{\gamma}^A - \underline{\gamma}^A)}{1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)} [\theta^A + \Phi^B + R(\eta^{BB}) - \Phi^A - R(\eta^{AA}) + R(\eta^{AA})] \\ \Phi^{CB} &= \frac{\delta(\bar{\gamma}^B - \underline{\gamma}^B)}{1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)} [\theta^B + \Phi^A + R(\eta^{AA}) - \Phi^B - R(\eta^{BB}) + R(\eta^{BB})] \end{aligned}$$

For simplicity denote $\Psi^i = \frac{\delta(\bar{\gamma}^i - \underline{\gamma}^i)}{1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)}$. Solving this system for the fixed point $(\Phi^A, \Phi^B) = (\Phi^{CA}, \Phi^{CB})$ yields:

$$\begin{aligned} \Phi^A &= \frac{\Psi^A(1 + \Psi^B)(\theta^A + R(\eta^{BB})) + \Psi^A\Psi^B(\theta^B + R(\eta^{AA}))}{1 + \Psi^A + \Psi^B} \\ \Phi^B &= \frac{\Psi^B(1 + \Psi^A)(\theta^B + R(\eta^{AA})) + \Psi^A\Psi^B(\theta^A + R(\eta^{BB}))}{1 + \Psi^A + \Psi^B} \end{aligned}$$

Since there is a single fixed point, uniqueness of MPE is shown. This discussion establishes the following proposition.

Proposition 1 *The model presents a unique MPE. In equilibrium, in state $S = A$ (when $S = B$ the expressions are symmetric):*

1. L^A proposes the following policy vector:

$$\begin{aligned}\eta^{AA} &\equiv \eta_*^A \text{ such that } R'(\eta_*^A) = \pi^A \\ \eta^{AB} &= 0 \\ \tau^{Aa} &= \frac{\Psi^A(1 + \Psi^B)\theta^A + \Psi^A\Psi^B\theta^B}{1 + \Psi^A + \Psi^B} + \\ &\quad + \frac{(1 + \Psi^A)(1 + \Psi^B)R(\eta_*^A) + \Psi^A(1 + \Psi^B)R(\eta_*^B)}{1 + \Psi^A + \Psi^B}\end{aligned}\tag{2.19}$$

$$\begin{aligned}\tau^{Ab} &= \frac{\Psi^A(1 + \Psi^B)\theta^A + (1 + \Psi^A)(1 + \Psi^B)\theta^B}{1 + \Psi^A + \Psi^B} + \\ &\quad + \frac{(1 + \Psi^A)(1 + \Psi^B)R(\eta_*^A) + \Psi^A(1 + \Psi^B)R(\eta_*^B)}{1 + \Psi^A + \Psi^B}\end{aligned}\tag{2.20}$$

2. The citizens of group A accept this policy vector: $s^A = 0$

3. No activity switch occurs: $z^A = z^B = 0$

This MPE is related to the unique equilibrium of the finite horizon version of this game: denote by Γ_T a game with exactly the same stage game as the model presented above, but repeated a finite number of times T . Since this game has a final stage, backwards induction can be used to find the unique subgame perfect equilibrium of the finite game. The following proposition establishes a link between this unique SPE and the unique MPE of the infinite horizon game.

Proposition 2 *Consider a game Γ_T . Then:*

1. Γ_T has a unique SPE
2. The limit as $T \rightarrow \infty$ of the unique SPE of Γ_T yields the same payoffs as the MPE described in Proposition 1

The proof of this proposition can be found in the Appendix²⁴. This convergence exists because both equilibria are qualitatively identical: in both of them, the incumbent is never

²⁴This result follows from uniqueness of SPE in the finite horizon game and uniqueness of MPE in the infinite horizon game (see Fudenberg and Tirole (1991)). Nonetheless, the proof in the appendix is constructive in the context of this game.

ousted, and she steals from her own supporters exactly the difference between staying under her rule and the lottery between replacements. It helps the intuition to examine what happens in the last period. The incumbent has to leave her supporters indifferent between ousting her and giving her support. Since there is no future, she cannot threaten them with a bleak perspective and hence she has to give them at least ω^A utility. She does exactly this by taxing them $\tau^{Aa} = R(\eta_*^A)$ because this allows her to maximize extraction from the excluded group. Note that this creates a wedge between being in the supporter versus the excluded group in the last period that the leader can exploit in $T - 1, T - 2 \dots$. Hence, starting in $T - 1$, the leader can reduce her supporter's utility below ω^A . The further away from the end of the game, the less the constraint of giving ω^A to the supporters in the last period binds. Hence, the payoffs converge to the ones in the MPE from above²⁵.

2.4 Discussion and Interpretation

The first subsection underscores a number of equilibrium characteristics and interprets them under the light of ethnic bias in Africa. The second one highlights the main lesson extracted from the game-theoretical modeling of the mechanism: any reason that allows one type of ruler to steal will spread throughout the economy to allow the venality of any type of ruler. The role of weak institutions is examined afterwards, shedding some light on the unwillingness of African leaders to develop their institutional framework. A final subsection explores the applicability of the specific mechanism developed in the model to different social and institutional frameworks than the ones pervasive in Africa.

2.4.1 Policy Determination and Ethnic Bias

The unique MPE of the model provides an explanation for many features of the post-colonial political economy of Africa.

²⁵The model presents other SPE. For instance, citizens can use the MPE as a punishment device in trigger strategies equilibria in which they force the leader to present them with a particular level of utility, under the threat of being replaced. If the group that is supposed to replace does not do so, then the play jumps to the MPE forever. In any case, these equilibria need a lot of coordination behind the "veil of ignorance", and a problem of divided societies is precisely that groups find it very difficult to trust, communicate and coordinate across ethnic lines. Avoiding dialog across groups is the basis of the "divide and rule" strategies played by the rulers.

First, the model endogenously generates inefficient policies. Note that in the simple framework proposed here, the unique potential source of inefficiency is the excessive allocation of patronage to a particular group. Since the opportunity cost of public funds is 1, the fact that the marginal return to patronage for the supporter group is $\pi^A < 1$ shows that political needs cause inefficiencies. This feature of the equilibrium helps explain the patterns of inefficient taxation and inefficient transfers coexisting in the same group highlighted in the seminal work by Bates (1981) for agricultural policies in tropical Africa. The ruler needs to buy support from her own group while, at the same time, wants to extract a lot of resources from the economy. The best way of doing so, given the absence of lump-sum taxation, is by taxing both groups and then returning some patronage to the supporters even if this is highly wasteful. This is a general pattern of statism in Africa.

Second, the model predicts a very strong bias in the allocation of public funds. The excluded group receives no public benefits while the supporter group receives public resources beyond the optimal point. The use of public money in the form of bureaucratic posts, infrastructure or even access to schools as a form of patronage, as well as the ethnic bias in the allocation of these goods has been widely documented in Africa. Gikuyus and later Kalenjin in Kenya, northern groups in both Nigeria and Uganda or Tutsis in Burundi are just salient examples that reproduce across the continent. The bias in favor of the ruling group is conspicuous and is actually one of the basic sources of resentment between ethnic groups²⁶. Not only access to these positions is biased, but is accompanied by an absence of meritocratic pressure that makes them ripe for all kinds of corruption, official and unofficial²⁷.

Third, the bias is not only present in the allocation of patronage: taxation is also differential across groups. In particular, in addition to taxes levied on the supporter group, the model shows that the excluded group is expropriated from the non-transferable share of its wealth. Bates (1981) and Bates (1989) provide evidence of this pattern: in Ghana and Uganda, among other examples, the coalition that supported the leader extracted resources from the coffee and cocoa planters. These are crops that involve a lot of specific long term investment. On the contrary, in Kenya the Gikuyu controlled the coffee growing parts of the country, and hence

²⁶See Horowitz (1985), Bates (1983)

²⁷See Collier and Garg (1999) for an account of how ethnic and kinship ties are rewarded in the form of salaries.

the discrimination against these crops was much less evident.

The combination of higher taxation and absence of patronage makes the excluded group obviously worse off than the supporter group. As a consequence, whenever there is a change in the group controlling power, the patterns of taxation change and purges follow in order to make space for the new elites. For instance, the ascension to power by Moi in Kenya was followed by a substitution of Gikuyus by Kalenjin in all echelons of the state²⁸. In Ghana, cocoa has been heavily taxed by all governments, civil and military, except the one headed by Kofi Busia, a native from the Ashanti region which contains a large share of smallholders that grow cocoa. In Cameroon, the substitution of Ahidjo in 1982 unleashed another deep ethnic purge of the bureaucracy. Similar dynamics are found in Nigeria. Ironically, these purges tend to take place under the excuse of anti-corruption initiatives. These switches prove the use of public resources as patronage, as well as the conscious status of "ruling" groups versus "excluded" groups.

This pattern of discrimination both in raising revenue and in public expenditures supports the vision that a particular ethnic group has the government captured²⁹. The model suggests that the actual benefits of such capture are not spread throughout the group. The particular elite that holds power extracts so much resources that part of this money comes from the pockets of non-elite members of the group. In equilibrium it is very easy to see that (2.19) can be rewritten as $\tau^{Aa} = \Phi^A + R(\eta_*^A)$. Hence, since $\Phi^A > 0$, this is exactly the amount by which the ruler is able to *reduce* her followers' utility. The next subsection studies the determinants of Φ^A .

This result is also consistent with casual empiricism. In Kenya, a potential political cleavage, and a reason why Kenyatta used the ethnic card to maintain power was the situation of landless Gikuyus, most of them ex Mau Mau fighters. These downtrodden masses did not obtain anything from the regime, even though it was clear to all observers and political participants that Kenyatta was at the helm of a "Gikuyu" regime. Emphasizing the fact that the majority of Gikuyu were not actually receiving their share of the spoils was obviously threatening to the regime. That is why the leadership had to act hastily whenever any political entrepreneur tried

²⁸See Barkan and Chege (1989) for an account of the reallocation of posts and resources.

²⁹These dynamics have been crystalized in the much repeated sentence "it is our turn to eat". See, for example, Wa Wamwere (2003).

to shed light on these facts. This included the assassination of a popular politician in 1975³⁰. Wa Wamwere (2003) describes this absence of balance in the reception of spoils in a colorful way:

“The cream of government service goes to the ruling ethnic elites, the crumbs to the lesser ethnic elites, and dust to members of the so-called ruling ethnic community” and “Among the Gikuyu of Kenya, the approving masses are called grill lickers, *njuna ndara*”.

The fact that non-elites are not receiving much from the government is by no means unique to Kenya³¹.

Fourth, the results of the model rationalize the existence of kleptocratic elites supported by masses of impoverished ethnic followers. Even though in absolute terms the masses are made worse off by the existence of rent-creating policies, in relative terms it is much better to belong to the group in power than to the excluded group, and hence they are willing to defend the status quo vis à vis a leader from another group. The members of a narrow elite around the leader are thus the ones extracting the lion’s share of the rents that these inefficient policies create. Evidence of Kleptocratic tendencies abound in Africa, but Mobutu’s Zaire is probably the most cited example. Sani Abacha in Nigeria or Daniel arap Moi in Kenya have been able to amass personal fortunes counted in the billions of dollars³². Even a relatively well-considered leader, such as Houphouet-Boigny in Cote d’Ivoire had his share of personal aggrandizement projects, such as a marble covered cathedral in his home town. Consistent with this concentration of wealth at the highest levels of leadership, Africa is the continent with highest capital flight³³.

2.4.2 Amplification of Kleptocracy

The theoretical reason that supports kleptocratic regimes in this model is summarized in expression (2.7). It makes clear that as long as the supporter group observes a difference between

³⁰See Throup and Hornsby (1998:19). They write that this leader was “(...) attempting to mobilize the kikuyu masses -the *masakini* (literally, the poor)- against the conspicuous wealth of the kikuyu elite, especially Kenyatta’s relatives and close allies.”

³¹“Ordinarily it is the representatives and fiduciaries of ethnic groups, more than the general members, who gain privileges or suffer punishments under systems of personal rule,” from Jackson and Rosberg (1983)

³²See Ayittey (1992), Wa Wamwere (2003), Mbaku (2000) or any account of corruption in Africa.

³³Collier and Gunning (1999)

being in the supporter status and being excluded under the leadership of the opponent group, there is a surplus that the current leader can expropriate from her own supporters. In addition, the more a leader can extract from her supporters, the more she can extract from the excluded group, thanks to (2.5) being binding in equilibrium. As a consequence, there is an amplification effect of any characteristic of the economy that allows one ruler to steal.

Assume that the institutional or economic technology of this society changes so that L^B is now able to steal more from her group if she is ever in power. An A citizen understands that, in equilibrium, this will mean that should he ever fall into an excluded status, his plight will be worse. This reduces $V^A(B)$ in equilibrium. But obviously, this loses the non-subversion constraint for L^A and as a consequence, L^A is able to increase τ^{Aa} to the point where her supporters are again indifferent between giving her support or subverting and taking a lottery that now is much less favorable, since both $V^A(A)$, and $V^A(B)$ are reduced. This amplification mechanism is the reason why in the expressions for equilibrium taxation in Proposition 1 the economic and institutional characteristics of both groups appear.

Expression (2.19) can be rewritten to identify the substantive forces that allow the leader to reduce the utility of her own group:

$$\tau^{Aa} = \frac{\Psi^A(1 + \Psi^B)\theta^A + \Psi^A\Psi^B\theta^B}{1 + \Psi^A + \Psi^B} + \frac{\Psi^A\Psi^B R(\eta_*^A) + \Psi^A(1 + \Psi^B)R(\eta_*^B)}{1 + \Psi^A + \Psi^B} + R(\eta_*^A) \quad (2.21)$$

The gap between τ^{Aa} and $R(\eta_*^A)$ is exactly Φ^A , the amount the ruler reduces her supporters' utility. It is easy to see that the forces that allow leaders to create a wedge between supporters and excluded are their ability to discriminate in taxation, captured by the first summand and their capacity to allocate patronage, captured by the second summand in (2.21). Hence, both tools that the ruler can manipulate in this reduced form model are used. If the ethnic structure does not coincide with an economic sectorial cleavage or there are no important specificities in the economy (this would be a case in which θ^A and θ^B are small) the ruler cannot discriminate in taxation but patronage still makes a difference in the utility of her supporters and hence they are still reluctant to increase the probability of an ethnic switch in the leadership.

In the model, the net amount of funds that the leader L^A is able to extract equals $X^A = \Phi^A + R(\eta_*^A) + (1 - \pi^A)\theta^B - \pi^A\eta_*^A$. By the envelope theorem (and because $\mu = 1$ in (2.8)), all

the interesting effects enter through Φ^A :

$$\begin{aligned}\frac{\partial X^A}{\partial \theta^A} &= \frac{\partial \Phi^A}{\partial \theta^A} = \frac{\Psi^A(1 + \Psi^B)}{1 + \Psi^A + \Psi^B} > 0 \\ \frac{\partial X^A}{\partial \theta^B} &= \frac{\partial \Phi^A}{\partial \theta^A} + \lambda = \frac{\Psi^A \Psi^B}{1 + \Psi^A + \Psi^B} + 1 - \pi^A > 0\end{aligned}$$

The amount of expropriation from both groups, independently of the allegiance of the leader, is increasing in the share of non-transferable resources in the economy. This result implies that starting from a situation with low θ^A and θ^B , an increase in the share of non-transferable wealth anywhere in the economy increases equilibrium misbehavior by the ruler. In the case of a citizen of group A , an increase in θ^A implies increased expropriation by a potential L^B . As a consequence, she allows her leader to steal more from her. An increase in θ^B has two effects: the direct one comes from the tax markup that L^A charges on group B . In addition, there is the amplification effect: an increase in θ^B means that the B citizens will be afraid of losing power if they ever regain it, and hence a B leader will be able to steal more from them and, as a consequence, steal more from A citizens that would be excluded in that case. Therefore an increase in θ^B allows L^A to reduce her supporters' utility further. These comparative statics provide a rationale for the well documented "natural resource curse": an increase in θ^i may capture the discovery of some mineral resource in the land of a particular group.

Comparative statics with respect to the ethnic demographic balance are ambiguous. On the one hand, all the direct effects predict a reduction in stealing: increasing π^A reduces the benefits from distorting the patronage good for two reasons. First, rents are reduced at each level of provision because it becomes more expensive to provide it. Moreover, the optimal level of distortion is reduced because the returns are reduced (less people in the excluded group to pay for it).

In addition, increasing π^A reduces the fraction of population excluded, and hence reduces the extra revenue that comes from the extraction of their non-transferable resources.

However, there is a third, indirect effect, that makes the overall effect ambiguous: increasing π^A means that, should group A ever lose power, a potential L^B would be able to steal more: she would increase distortions in the allocation of η_*^B because her basis of support would now be smaller. Using the same logic of amplification, this allows an L^A leader extra room for stealing.

Explicitly, the partial derivative has the following expression:

$$\frac{\partial X^A}{\partial \pi^A} = \frac{\Psi^A \Psi^B}{1 + \Psi^A + \Psi^B} \frac{R'(\eta_*^A)}{R''(\eta_*^A)} - \eta_*^A - \theta^B - \frac{\Psi^A(1 + \Psi^B)}{1 + \Psi^A + \Psi^B} \frac{R'(\eta_*^B)}{R''(\eta_*^B)}$$

The first two summands represent the rents lost from the ability to distort η_*^A and the third is the direct loss that is a consequence of the smaller size of the excluded group. The last summand represents the indirect effect, and it is positive³⁴. For general functional forms of $R(\cdot)$ this expression cannot be signed, but note that if $R(\cdot)$ is a power function, $\frac{R'(\eta)}{R''(\eta)}$ is increasing in η . Hence, if the third indirect effect ever dominates, it will do so at high levels of π^A . That is, when the A group includes a wide majority of the population, the prospect of falling under a B leader is most terrifying because L^B will have a very narrow basis of support, and hence she will use extreme distortions of patronage to steal.

2.4.3 The Effect of Institutions on Rent-Seeking

If the probability of an ethnic turnover captures the degree of institutional strength, it is informative to analyze the comparative statics of stealing with respect to these set of parameters.

In particular, it is easy to show that:

$$\begin{aligned} \frac{\partial X^A}{\partial \bar{\gamma}^A} &= \frac{\partial \Phi^A}{\partial \bar{\gamma}^A} = \frac{\partial \Phi^A}{\partial \Psi^A} \frac{\partial \Psi^A}{\partial \bar{\gamma}^A} + \frac{\partial \Phi^A}{\partial \Psi^B} \frac{\partial \Psi^B}{\partial \bar{\gamma}^A} > 0 \\ \frac{\partial X^A}{\partial \bar{\gamma}^B} &= \frac{\partial \Phi^A}{\partial \bar{\gamma}^B} = \frac{\partial \Phi^A}{\partial \Psi^A} \frac{\partial \Psi^A}{\partial \bar{\gamma}^B} + \frac{\partial \Phi^A}{\partial \Psi^B} \frac{\partial \Psi^B}{\partial \bar{\gamma}^B} > 0 \\ \frac{\partial X^A}{\partial \underline{\gamma}^A} &= \frac{\partial \Phi^A}{\partial \underline{\gamma}^A} = \frac{\partial \Phi^A}{\partial \Psi^A} \frac{\partial \Psi^A}{\partial \underline{\gamma}^A} + \frac{\partial \Phi^A}{\partial \Psi^B} \frac{\partial \Psi^B}{\partial \underline{\gamma}^A} < 0 \\ \frac{\partial X^A}{\partial \underline{\gamma}^B} &= \frac{\partial \Phi^A}{\partial \underline{\gamma}^B} = \frac{\partial \Phi^A}{\partial \Psi^A} \frac{\partial \Psi^A}{\partial \underline{\gamma}^B} + \frac{\partial \Phi^A}{\partial \Psi^B} \frac{\partial \Psi^B}{\partial \underline{\gamma}^B} < 0 \end{aligned}$$

None of these comparative statics are ambiguous³⁵. From these comparative statics it is clear that the level of rent extraction is increasing in both $(\bar{\gamma}^A - \underline{\gamma}^A)$ and $(\bar{\gamma}^B - \underline{\gamma}^B)$. The first one is obvious from constraint (2.7): the leader can extract more resources from her followers the more their probability of keeping power depends on maintaining this particular leader. In other

³⁴Recall that it is assumed that $R' < 0$

³⁵The expressions for each partial derivative are listed in Appendix 2 for completion.

words, the incumbency advantage ($\bar{\gamma}^A - \underline{\gamma}^A$) makes “fear” ($V^A(A) - V^A(B)$) a real possibility and thus scales its impact. The fact that L^A can expropriate more the bigger $\bar{\gamma}^B - \underline{\gamma}^B$ is follows from the logic of amplification of kleptocracy discussed in the previous subsection.

Hence stealing increases with institutional uncertainty and personality-dependent control of power. In particular, the leader would like to reduce the grip on power of her followers if she is ousted, while at the same time strengthen her ethnic group position vis-à-vis the excluded group as long as she is in power. While these parameters depend on characteristics of the polity beyond the control of the ruler, such as the demographic ethnic balance, it certainly also depends on institutional factors.

These comparative statics explain the weakening of the correlation between ethnic fractionalization and bad economic outcomes at high levels of institutional development. Even with a divided society a leader cannot extract much from the citizenry if the hold in power of a particular group and the stability of a particular regime does not depend on the personal links of the ruler on top. This reduction on personality dependent incumbency advantage is precisely a sign of institutional strength and hence it is not surprising that the margin to misbehave in strongly institutionalized polities is very much reduced.

This model is not the right framework to think about questions of institutional development but the logic of the mechanism shows that the leader has no incentive to strengthen the institutional framework if this means increasing her accountability. This sheds light on several facts.

First, this is consistent with the behavior of the leadership in most African countries: from the moment of independence, even the first prophetic leaders such as Nkrumah, clamped down on opposition, banned political parties, used the police and the military in a partisan way, did not respect judicial independence or any kind of separation of powers and imposed censorship on the press. These are not actions of rulers interested in institutional consolidation. These actions repress both excluded groups and potential replacement leaders from the group of the current leader, thus increasing $\bar{\gamma}^i - \underline{\gamma}^i$.

Second, it is very important for the leaders not to allow the presence of a strong and obvious second-in-command. This would permit her followers to replace her and quickly coordinate on

giving support to this alternative focal point and thus reduce the risk of being taken over³⁶. In the context of the model, this would increase $\underline{\gamma}^i$. Jackson and Rosberg (1982) write “As long as a ruler retains command in African states, an overriding consideration in succession rivalries is that they be concealed from him”. The reason given in their book is that presenting candidacy as successor may signal the politician as an ambitious man keen on substituting the ruler, and hence a potential target for oppression. The reason in the model proposed in this paper is more general. Even if the successor could guarantee not to plot against the ruler, his mere designation reduces institutional uncertainty and, as a consequence, reduces the margin of the leader to steal. A typical way of getting rid of close collaborators that have become too powerful or focal, and therefore a potential threat is to claim their involvement in a coup plot against the current leader. Note that this is also a pervasive feature of regimes of personal rule³⁷.

2.4.4 Beyond Africa

This mechanism is especially relevant in explaining the extent of kleptocracy, clientelism and inefficiency in Africa because of the continent’s societal characteristics and the political constraints which its leaders face, but by no means it is exclusive to politics in Africa. To extrapolate the argument to other circumstances, the key ingredients of the mechanism have to be described in detail.

First, existence of groups is necessary. Two characteristics of group definition are essential: it has to be very difficult to cross the group division ex-post, and it has to be possible to specifically target the utility of the groups with policy. The saliency of ethnicity in Africa creates a natural rigid dividing line. However, a strong ideological divide would suffice. For instance, a citizen can classify herself as a moral conservative, and she knows that tomorrow she will most probably still be a moral conservative. Some dimensions of policy, such as religious and moral tolerance affect her utility differently from the utility of a liberal person. For example, Divorce Legalization probably increases the utility of a socially liberal person but reduces that

³⁶There are numerous accounts of the obsession of long term leaders in refusing to designate anybody as a successor, being Malawi’s Banda probably the most notorious.

³⁷Sekou Toure’s Guinea was famous for the ridiculous amount of coup plots allegedly discovered against the leader. See Jackson and Rosberg (1982) or Cartwright (1983) for an account of these facts.

of a moral conservative.

Second, the group-identity of the leader has to be able to create a difference between the payoff of groups. The absence of institutional constraints enlarges the set of policies that the African ruler can use to widen the utility gap between supporters and opposition. In particular, an African leader can use violence, discrimination and patronage to increase the utility of her supporters and reduce that of the excluded. As institutional strength increases, the leader faces a reduction in her set of feasible discriminatory policies. Nonetheless, the identity of the leader still makes a difference in issues such as social policy and foreign policy which can target ideological groups differently even in strongly institutionalized democracies. Given the group-identity of the ruler, she is able to commit to these policies in the future and, as a consequence, enlist the support of her group.

Third, support from the group must make a difference in maintaining the leader in power. Arguably, in an African Personal Rule regime, the ability to mobilize ethnic allegiances is essential for the survival of the leader. Moreover, since succession mechanisms are not established, uncertainty follows subversion. However, to some extent, every voter in a strongly institutionalized democracy faces a similar dilemma: the only way for the voter to punish a perceived deviation³⁸ from a leader from her group is not to vote for her. Unfortunately, by withholding the vote, the voter is marginally increasing the probability that a candidate from the opposite group is elected, which entails a loss in utility.

Hence, the difference between a well-functioning democracy and the kleptocracies that are present in Africa is just one of degree: strong institutions limit the extent to which a group can capture power and restrict the set of tools that the leader can use to widen the gap between supporters and the opposition. As a consequence, stealing or shirking in office is restrained. As institutions place less constraints on the leader and societal divisions grow wider, accountability of the rulers is weakened. In the case of Africa, both circumstances occur in their extreme form and, as a consequence, outright kleptocracy is sustainable.

³⁸Strong institutions affect the possibility of outright stealing in western countries. But there are many instances of ideological shirking or other ways in which the ruler extracts a personal benefit at a cost for her supporters.

2.5 Extensions

2.5.1 On Public Investment

The evidence from Africa shows that governments overspend in wages and undertake very little of infrastructure construction³⁹. The intuition from the model clarifies why this is the case.

Note that in the model wages are explicitly considered. The nature of patronage η is such that it is a flow concept that has to be pledged at every stage and has no consequences for the future. Public wages fall into this category: bureaucrats can easily be replaced or moved to different areas. As a consequence, by expanding public sector employment beyond optimality among her supporters and placing them in their area, the leader creates a network of clients personally invested on the continuation of the status quo. This is a reason besides outright corruption and misappropriation why public sector wages swallow a much bigger share of public expenditures in Africa than in other less developed economies.

A simple extension of the model that includes the possibility to invest in durable infrastructures clarifies which kind of projects suffer from underinvestment when the leader can use divisions and weak institutions to capture the support of her group.

Assume that the policy vector $P_t^S = \{\tau^{Aa}, \tau^{Ab}, \eta^{AA}, \eta^{AB}, I^A\}$ is now a 5-tuple that includes I , public investment. This investment contributes to a stock of public capital K . This stock evolves according to the following dynamics: $K_t = \varsigma K_{t-1} + I_{t-1}$. Hence, investment today increases the stock of public capital tomorrow and this capital depreciates at a rate $1 - \varsigma$. The stock of infrastructure provides a benefit $F(K)$ to the supporter group and $\beta F(K)$ to the excluded group, for $\beta \leq 1$. β thus captures the degree of excludability of public infrastructure. A pure public good would have $\beta = 1$. Assume that $F' > 0$ and $F'' < 0$. If there is replacement of a leader, the revolt vector is extended to $P_r = \{0, 0, 0, 0, 0\}$ and therefore the government does not invest for that period. Assume, finally, that when there is a revolt, the enjoyment of the public infrastructure is reduced to $\psi F(K)$, for $\psi \leq 1$. ψ captures the instantaneous cost of upheaval.

To simplify the analysis, and in particular the dynamics that a new state variable could

³⁹See Collier and Gunning (1999) for an account of these patterns. See also Mbaku (2000) and Bates (1981) for some examples in Cameroon, Nigeria and Ghana of excess expenditure in wages.

introduce, assume that leaders have no financial constraints and their instantaneous utility is linear: $U_t^A = \pi^A(\tau_t^{Aa} - \eta_t^{AA}) + (1 - \pi^A)\tau_t^{Ab} - (K_{t+1}^A - \varsigma K_t^A)$. This implies that the optimal level of capital in steady state will be reached as soon as a leader has a chance to invest. As a consequence, the transitory that replacing the leader induces lasts only one period, precisely because of the absence of investment when there is a revolt. Hence I can set the problem in terms of the desired level of capital for next period \tilde{K}^A , and investment will just be determined as a residual: $I_t = \tilde{K}^A - \varsigma K_t^A$. In addition, assume that $\bar{\gamma}^A = \bar{\gamma}^B = 1$, for expositional clarity (in this case, support from the group is enough to keep power with certainty).

The model can be solved in exactly the same way as the previous case⁴⁰. In particular, the Markov Perfect Equilibrium has the same characteristics: the leader in power satisfies the constraint that makes her supporters indifferent between replacing her and supporting her rule. Hence, in equilibrium there is no replacement of the leadership. To examine explicitly the new support constraint, note that when supporters do not revolt, $s_t = 0$, they receive:

$$\omega^A - \tau_t^{Aa} + R(\eta_t^{AA}) + F(K_t^A) + \delta(\omega^A - \tau_{t+1}^{Aa} + R(\eta_{t+1}^{AA}) + F(K_{t+1}^A)) + \delta^2 V^A(A)$$

On the other hand, if they revolt, $s_t = 1$, they obtain:

$$\begin{aligned} &\omega^A + \psi F(K_t^A) + \delta(\underline{\gamma}^A[\omega^A - \tau_{t+1}^{Aa} + R(\eta_{t+1}^{AA}) + F(\varsigma K_t^A)] + (1 - \underline{\gamma}^A)[\omega^A - \tau_{t+1}^{Ba} + \beta F(\varsigma K_t^A)]) + \\ &+ \delta^2(\underline{\gamma}^A V^A(A) + (1 - \underline{\gamma}^A)V^A(B)) \end{aligned}$$

Note that in writing these expected values I am already making use of the fact that the transitional period will only last one stage before setting into a new equilibrium level. Hence, the support constraint, using stationarity, can be written as:

$$\tau_t^{Aa} - R(\eta_t^{AA}) + (\psi - 1)F(K_t^A) + \delta(1 - \underline{\gamma}^A)[\tau_{t+1}^{Aa} - R(\eta_{t+1}^{AA}) - \tau_{t+1}^{Ba}] - \quad (2.22)$$

⁴⁰The inclusion of a new state variable may create multiplicity of MPEa. For expositional ease I only analyze the equilibrium most similar to the previous case in which strategies are not conditional on the stock of capital.

$$\begin{aligned}
& -\delta F(K_{t+1}^A) + \delta[\underline{\gamma}^A + (1 - \underline{\gamma}^A)\beta]F(\varsigma K_t^A) \\
& \leq \frac{\delta^2}{1 - \delta}(1 - \underline{\gamma}^A)[\tilde{\tau}^{Ba} - \beta F(\tilde{K}^B) - \tilde{\tau}^{Aa} + R(\tilde{Z}^{AA}) + F(\tilde{K}^A)]
\end{aligned}$$

The ruling leader faces a problem identical to (2.8) with an additional choice variable, K_{t+1}^A and the support constraint replaced by (2.22). The first order conditions from this program imply that the chosen level of K_{t+1}^A will be determined implicitly by the following expression:

$$F'(K_{t+1}^A)(2 - \psi) - \delta[\underline{\gamma}^A + (1 - \underline{\gamma}^A)\beta]\varsigma F'(\varsigma K_{t+1}^A) = \frac{1}{\delta} - \varsigma \quad (2.23)$$

The interpretation of this expression is a little involved. It can be separated in two parts: $F'(K^A)(1 - \psi)$ is the marginal effect on τ^{Aa} caused by the contemporaneous effects of upheaval: if there is no revolt, supporters enjoy the whole return from infrastructure, while subversion reduces it to a fraction ψ . $F'(K^A) - \delta[\underline{\gamma}^A + (1 - \underline{\gamma}^A)\beta]\varsigma F'(\varsigma K^A)$ is the effect on τ^{Aa} caused by the effect of upheaval on next period's returns: if there is no subversion, citizens will receive the full return per period, $F(K^A)$ while ousting the leader has two effects. First, it will reduce the stock of capital tomorrow to ςK^A , because of the absence of investment today. Second, the citizens enter on the lottery for the replacement, which means that their expected enjoyment is scaled down by $[\underline{\gamma}^A + (1 - \underline{\gamma}^A)\beta]$. Note that the equivalent expression for a social planner that would take the welfare of both groups into account would be:

$$[\pi^A + \beta(1 - \pi^A)]F'(K_{t+1}^A) = \frac{1}{\delta} - \varsigma$$

A comparison of both expressions gives a sense of which parameter values will make the level of capital under the ruler diverge most from the social optimum. First, the right hand side of both conditions is equal: marginal costs are the same for both the social planner and the ruler, and obviously, costs increase with depreciation.

Second, the left hand side of (2.23) implies that the leader will invest more in capital the faster the good depreciates and the less useful it is during upheaval. That is, her investment is

decreasing⁴¹ in ς and ψ . These two forces are ignored by the social planner⁴². There are political reasons behind these effects: reduction in ς and/or ψ increases the costs of subverting the authority of the leader. In particular, one of the costs of upheaval is the absence of investment for one period, because the state stops working. Obviously, this is not a large cost if depreciation is very slow and, as a consequence, investment is very small each period. On the contrary, when ς approaches 0, K behaves very similarly to η , and it has been shown above that in this case there is overspending in patronage. The reason for investment to decrease with ψ is exactly the same.

Third, excludability (β) features in both expressions with contrary effect. When supporters know that they can be easily excluded from enjoying public capital if there is a change in the leadership, they are more eager to defend the current regime. Hence an increase in β reduces investment by the leader. For the social planner, investment is increasing in β because more people are able to enjoy the public infrastructure and social welfare increases while costs remain the same.

Assuming that $F(K) = K^\alpha$, for $\alpha < 1$, allows an explicit look at the gap between the capital level of the leader and the socially optimal level. Denote by \tilde{K}^A the level chosen by the ruler and by K^* the level chosen by the social planner. The ratio of both expressions satisfies:

$$\left(\frac{\tilde{K}^A}{K^*}\right)^{1-\alpha} = \frac{2 - \psi - \delta[\underline{\gamma}^A + (1 - \underline{\gamma}^A)\beta]\varsigma^\alpha}{\pi^A + \beta(1 - \pi^A)}$$

Note that this ratio is decreasing in β , ψ and ς . The intuitions have been explained above. Note that when $\beta = \psi = \varsigma = 1$, the relative level of capital provided by the leader is very low, because δ is close to 1.

The absence of investment in infrastructure can thus be interpreted under the light of the model. The political survival of the leader hinges on creating a network of supporters personally dependent on her presence in power. Building a road gives no advantage to the leader, because the day a coup ousts her from power the road will still be there for everybody to enjoy. The same is true for a hospital or a school. Hence there is underprovision of capital when it is very

⁴¹As long as $\varsigma F'(\varsigma K)$ is increasing in ς .

⁴²Obviously, if the good depreciates faster any investor would invest less in it, but this effect is present in the right hand side of both expressions.

permanent, it is not excludable and/or does not lose usefulness during periods of upheaval. At the other extreme of the parameter space, there is overprovision of capital. This is why the leader favors expenditures in wages and reduces infrastructure construction⁴³.

2.5.2 On Patterns of Ethnic Violence

The logic of the model can be extended to show that another way the leader can enlist the support of her ethnic group is by making sure that ethnic supporters disproportionately fear the prospect of being under the rule of another group. The ruler can contribute to this fear by acting heavy-handedly against oppressed groups, and making sure that her rule is seen by everyone as ethnically based rule. Ayittey (1999) describes how ordinary Krahn people feared the demise of Samuel K. Doe, a fellow Krahn, in Liberia. Even though they did not receive any of the spoils from government, the fact that the regime was clearly almost exclusively Krahn, and that it was engaged in acts of pillaging, rape and atrocities against the other groups made clear to them that retribution would be against all Krahn the day the regime was defeated. Obviously, this made Krahn people collaborate in defending the regime, even in the absence of any spoil from the government. Hence, ethnic violence can be used to enlist otherwise reluctant members of the group in the defense the regime.

To see how the prospect of violence is equivalent to patronage links to the ruler the model can be extended in a very simple way. Assume that by oppressing the excluded group, the leader can contribute to the level of enmity that the excluded group holds against the supporter group. Call E_t^{AB} the level of enmity that group B has against A . Assume that this variable evolves in the following way $E_t^{AB} = \phi E_{t-1}^{AB} + o_t^{AB}$, where o_t^{AB} denotes the amount of costly oppression that L^A inflicts over B citizens. Assume further that living under the leadership of a group that stocks enmity against you causes disutility because of revenge, which is captured by $\Pi(E^{AB})$, with $\Pi' > 0$, $\Pi'' < 0$, and $\Pi(0) = 0$.

Now, if supporters don't subvert, $s_t = 0$, they will receive⁴⁴:

⁴³This argument for the existence of inefficient clientelist networks based on "flow" goods such as expanded public employment versus "stock" goods such as infrastructure is examined explicitly in Robinson and Verdier (2002). They develop other comparative statics, but the framework presented here explicitly links the appearance of these networks with the weak institutions and ethnic divisions present in Africa.

⁴⁴Again, for simplicity the case shown assumes $\bar{\gamma}^A = \bar{\gamma}^B = 1$

$$\omega^A - \tau_t^{Aa} + R(\eta_t^{AA}) + \delta V^A(A)$$

If they replace the leader, $s_t = 1$, they will receive:

$$\omega^A + \sum_{t=1}^{\infty} \delta^t \{ \underline{\gamma}^A (\omega^A - \tilde{\tau}^{Aa} + R(\eta_*^A)) + (1 - \underline{\gamma}^A) (\omega^A - \tilde{\tau}^{Ba} - \Pi(E_t^{AB})) \}$$

Hence, the support constraint can be written as:

$$\tau_t^{Aa} - R(\eta_t^{AA}) \leq (1 - \underline{\gamma}^A) \sum_{s=t+1}^{\infty} \delta^s (-\tilde{\tau}^{Aa} + R(\eta_*^A) + \tilde{\tau}^{Ba} + \Pi(E_s^{AB})) \quad (2.24)$$

Therefore, the leader maximizes $\sum_{t=1}^{\infty} \delta^t \{ \pi^A (\tau_t^{Aa} - \eta_t^{AA}) + (1 - \pi^A) \tau_t^{Ab} - (E_{t+1}^{AB} - \phi E_t^{AB}) \}$ under the usual no-switching constraints and (2.24). The optimal level of enmity that L^A seeks (as in the previous subsection she will jump right away to this level because of linear utility) is determined by:

$$\sum_{s=t+1}^{\infty} (\delta \phi)^s \Pi'(\phi^s E_*^{AB}) = \frac{1 - \phi \delta}{1 - \underline{\gamma}^A}$$

This expression shows that the leader will cause a higher level of enmity the slower enmity disappears (the higher ϕ), the smaller the time discounting (the higher δ) and the bigger the chance that the supporters will lose control of power should they replace the leader (the lower $\underline{\gamma}^A$). The intuition is perfectly in line with the rest of the argument developed in the paper: $V^A(B)$ is smaller the slower the rate of forgiveness. Moreover, $V^A(B)$ is more probable when $1 - \underline{\gamma}^A$ is small. Both effects make her supporters warier of entering into the replacement lottery and this allows the ruler to extract more resources.

To see that enmity behaves similarly to the capacity to discriminate in patronage, rename $\Lambda^{AB} = (1 - \underline{\gamma}^A) \sum_{s=1}^{\infty} \delta^s \Pi(\phi^s E_*^{AB})$. With this change of notation the model can be solved for the unique MPE which has the following expression for taxes extracted from the supporter group:

$$\begin{aligned} \tau^{Aa} = & \frac{(1 + \zeta^B) \zeta^A \theta^A + \zeta^B \zeta^A \theta^B}{1 + \zeta^A + \zeta^B} + \\ & + \frac{(1 + \zeta^B) \zeta^A \Lambda^{BA} + (1 + \zeta^B) \Lambda^{AB} + (1 + \zeta^A) (1 + \zeta^B) R(\eta_*^A) + \zeta^A (1 + \zeta^B) R(\eta_*^B)}{1 + \zeta^A + \zeta^B} \end{aligned}$$

where $\zeta^A = (1 - \underline{\gamma}^A) \frac{\delta}{1-\delta}$ and $\zeta^B = (1 - \underline{\gamma}^B) \frac{\delta}{1-\delta}$. Note that in this expression, the capacity to induce enmity enhances the capacity to steal in a similar way as the ability to discriminate in patronage. Kleptocracy can thus be supported by indiscriminate use of violence in the name of the group, as Samuel K. Doe's Liberia show.

This logic can be used to understand the scale of atrocities and ethnic cleansing in Rwanda in 1994. Prunier (1995) describes how the "hutu" regime of Habyarimana and the inner circle captained by his wife was besieged both by the Tutsi guerrillas of the RPF and the southern moderate hutu elites that were complaining at the level of corruption and kleptocracy concentrated in northern hands. By making the majority of the hutu population participate in the atrocities, the regime almost succeeded in doing two things. First they completely erased the northern-southern divide inside the hutu elites by either eliminating those hutus deemed too moderate or making them participate in the genocide. Second, the scale of atrocities against the tutsi minority was so horrific, that no hutu could accept the prospect of living under a tutsi leader for fear of equally horrible retribution. The massive scale of hutu refugee tides to Zaire is a testament to this strategy. This pattern of government sponsored ethnic violence, albeit in a somewhat smaller scale has been present in Uganda, Burundi⁴⁵ and other countries in the region.

Post-colonial rulers have not been the first ones in using these strategies in Africa. Multiple academic accounts, among them Cooper (2002) and Horowitz (1985) describe the process by which ethnic separation became a basic strategy of domination by the colonial powers. Some groups were protected and allowed to thrive but at the same time they were demonised among the rest of the population. In reality, political reasons were paramount in deciding whether nilotes were good for the army in Uganda and baganda were good for civil service. This process generated a basis of support for colonial presence but contributed dramatically to the creation of ethnic self-consciousness and resentment. These societies were, as a consequence, ripe for the exploitation of such divisions by their post-colonial leaders.

The logic of exclusion and replacement thus provides as a corollary a framework to understand some of the patterns of high and low level ethnic violence that plague deeply divided societies, especially when their governments define themselves in ethnic terms.

⁴⁵See Lemarchand (1996) for an account of the seeds of violence and patterns of ethnic domination in Burundi.

2.6 Conclusion

Post-colonial African leaders have provided very bad outcomes to their populations. These have been the result of flagrant abuse of power to impose distortionary and rent-creating policies on their economies. Moreover, these rents have been dissipated at the very top of the leadership, and some countries have been governed by outright kleptocracies. Nonetheless, accounts coincide in considering these regimes weak, which sheds doubt on the hypothesis that they have survived in power solely thanks to the use of force to oppress the whole population.

This paper advances a different explanation for such blatant absence of political accountability: weak institutions have allowed leaders to exploit ethnic divisions. In particular, the use of patronage networks allow the leader to treat her ethnic group better than the opposition and this makes ethnic supporters keen in maintaining this relative superiority. In a system of personal rule, replacing the ruler will be accompanied by upheaval and in such circumstances the current opposition could take control of the state. This combination makes supporters reluctant to replace the leader and hence rents are not dissipated. In fact, the ruler is able to extract resources from all groups in society. From the analysis I derive a number of corollaries that relate the amount of funds diverted by the leader to the structure of the economy and the quality of institutions.

Obviously, there are a number of factors contributing to this absence of accountability that have been left out of the stylized model. Here I name some of them, for further research. First, a particularly interesting factor is the collective action problem. Ousting a leader that governs in a personal rule regime probably entails activities that imply personal risk. Since the benefit of replacing the leader is collective, it is obvious that there is scope for free-riding. I did not include this element in the model because I wanted to show that even in the absence of collective action problems these leaders are able to establish kleptocracies in deeply divided societies, but there is no doubt that there is a lot to be learnt from an explicit analysis. In particular, oppression of the press has been a typical feature of these regimes. If there is a collective action problem, not allowing the press to report freely can contribute to make coordination matters even worse.

Second, it would be interesting to model explicitly the dual role of violence in my argument. First, it keeps a sizable share of the population in the excluded status and second, it prevents the emergence of any potential leader among the supporter group. These two patterns of violence

seem, for theoretical as well as empirical reasons, quite different and an explicit model may show, for example, why these regimes have kept the military weak while at the same time have used ethnic militias as a close, albeit difficult to control, substitute.

Third, the model assumes a society divided in the most trivial way: two groups. Adding more groups may offer some insights on the type of ethnic dictatorship that will emerge. It would be interesting to see if the existence of "pivotal" groups makes kleptocracy a less viable alternative, even though the empirical evidence does not seem to support this hypothesis. Is there an ethnic configuration of society that is differentially conducive to abusive rule?

Fourth and common with the majority of models that treat ethnic groups as given, the insight offered begs the constructivist critique: would this conclusion hold if we allowed groups to be generated endogenously by the action of ethnic elites? I would argue that not only the conclusion would be robust, but that we would actually observe these leaders trying to create or activate cleavages in society, following the lines of the colonizers. However, this process is not modeled explicitly and from such an engagement other lessons may be learnt.

The main lesson from the growing field of analysis of policy determinants in weakly institutionalized regimes is that their inefficiencies emerge because weak states impose a very particular set of constraints and needs on their rulers. The same is true for the political outcomes of such countries. Attempts at helping these economies have to take into account where the incentives of their leaders are (mis)placed. In particular, given the absence of accountability highlighted here, it is not surprising that enormous amounts of foreign aid have passed unnoticed through African economies to end up stashed in Swiss bank accounts. This paper is an attempt to offer a theoretical foundation for those who insist that serious institutional reform has to be attempted to improve the plight of African citizens.

2.7 Appendix 1: Proof to Proposition 2

First, note that a finite horizon version of the game will have a unique subgame perfect equilibrium (SPE): there are no simultaneous moves in the tree and instances of indifference are the result of the usual open set argument. Hence the generically unique SPE can be found by backwards induction.

Denote by V_T^{AA} the present discounted utility of the unique SPE for citizen A if the game starts with a leader L^A and the stage game is repeated T times. V_T^{AB} , V_T^{BB} and V_T^{BA} are defined equivalently.

Assume, without loss of generality that the game ends with a leader L^A . It is very easy to see that in the final stage of the game, in the unique SPE, the leader offers the following policy vector: $\{\tau_T^{AA}, \tau_T^{AB}, \eta_T^{AA}, \eta_T^{AB}\} = \{R(\eta_*^A), R(\eta_*^A) + \theta^B, \eta_*^A, 0\}$, where η_*^A is such that $R'(\eta_*^A) = \pi^A$. In this fashion the leader is providing utility ω^A to her supporters while optimally stealing from group B . The reason why she cannot reduce her supporters' utility is that there is no future and hence she would be replaced if her proposed policy induced a reduction in citizens' A utility. As a consequence, the leader is not replaced in the last period (her supporters are indifferent) and she earns some positive rents. Hence, the unique SPE of any finite horizon game will have the same properties as the MPE of Proposition 1: the leader never loses support and she steals to the point that her supporters are indifferent. Specifically, at each stage, the leader maximizes:

$$\text{subj.to} \quad \max_{\{\tau^{Aa}, \tau^{Ab}, \eta^{AA}, \eta^{AB}\}} \sum_{t=1}^T \delta^{t-1} [\pi^A (\tau_t^{Aa} - \eta_t^{AA}) + (1 - \pi^A) (\tau_t^{Ab} - \eta_t^{AB})]$$

$$\tau_t^{Ab} \leq \theta^B + \tau_t^{Aa} \quad [\lambda] \quad (2.25)$$

$$\tau_t^{Aa} \leq \theta^A + \tau_t^{Ab} \quad [\nu] \quad (2.26)$$

$$V_T^{AA} \geq \omega^A + \delta \underline{\gamma}^A V_{T-1}^{AA} + \delta (1 - \underline{\gamma}^A) V_{T-1}^{BA} \quad [\mu] \quad (2.27)$$

$$0 \leq \eta_t^{AB} \quad [\rho] \quad (2.28)$$

Constraints (2.25) and (2.26) are the usual no-switching constraints, while constraint (2.27) is the non-stationary finite horizon no-subversion constraint. In particular, the left hand side is the utility the supporters receive if they do not subvert (that is, they play the equilibrium strategy for a game of length T) and the right hand side is the expected utility of subverting: no

state interference today and the lottery between leaders from tomorrow onwards which provides exactly the same utility as a game of length $T - 1$.

The solution to this program yields that (2.25), (2.27) and (2.28) are binding at every t . State the definition of the present discounted utility in equilibrium:

$$\begin{aligned} V_T^{AA} &\equiv \omega^A - \tau_1^{Aa} + R(\eta_*^A) + \delta\bar{\gamma}^A V_{T-1}^{AA} + \delta(1 - \bar{\gamma}^A) V_{T-1}^{BA} \\ V_T^{AB} &\equiv \omega^B - \tau_1^{Ab} + \delta\bar{\gamma}^A V_{T-1}^{AB} + \delta(1 - \bar{\gamma}^A) V_{T-1}^{BB} \end{aligned}$$

By subtracting the second equation from the first and using (2.25) as binding, one obtains an equation in differences:

$$V_T^{AA} - V_T^{AB} = \omega^A - \omega^B + \theta^B + R(\eta_*^A) + \delta\bar{\gamma}^A (V_{T-1}^{AA} - V_{T-1}^{AB}) - \delta(1 - \bar{\gamma}^A) (V_{T-1}^{BB} - V_{T-1}^{BA})$$

Note that the same equation can be written in a symmetric fashion from the point of view of L^B . Now, denote $\Theta_T^A = V_T^{AA} - V_T^{AB}$ and $\Theta_T^B = V_T^{BB} - V_T^{BA}$. The two version of the previous equation can be written as a system in differences:

$$\begin{pmatrix} \Theta_T^A \\ \Theta_T^B \end{pmatrix} = \begin{pmatrix} \delta\bar{\gamma}^A & -\delta(1 - \bar{\gamma}^A) \\ -\delta(1 - \bar{\gamma}^B) & \delta\bar{\gamma}^B \end{pmatrix} \begin{pmatrix} \Theta_{T-1}^A \\ \Theta_{T-1}^B \end{pmatrix} + \begin{pmatrix} \omega^A - \omega^B + \theta^B + R(\eta_*^A) \\ \omega^B - \omega^A + \theta^A + R(\eta_*^B) \end{pmatrix}$$

The two eigenvalues of the transition matrix of this system are δ and $\delta(\bar{\gamma}^A + \bar{\gamma}^B - 1)$ hence both are smaller than 1 in absolute value. As a consequence the system converges to a well defined $\begin{pmatrix} \Theta_\infty^A \\ \Theta_\infty^B \end{pmatrix}$.

Using the definition of Θ_T^A and Θ_T^B , the system formed by (2.27) and the equivalent restriction from the problem of L^B , taken as binding, can be written as:

$$\begin{aligned} V_T^{AA} &= \omega^A + \delta\underline{\gamma}^A V_{T-1}^{AA} + \delta(1 - \underline{\gamma}^A) V_{T-1}^{BB} - \delta(1 - \underline{\gamma}^A) \Theta_{T-1}^B \\ V_T^{BB} &= \omega^B + \delta\underline{\gamma}^B V_{T-1}^{BB} + \delta(1 - \underline{\gamma}^B) V_{T-1}^{AA} - \delta(1 - \underline{\gamma}^B) \Theta_{T-1}^A \end{aligned}$$

Which can be rewritten as a dynamic system:

$$\begin{pmatrix} V_T^{AA} \\ V_T^{BB} \end{pmatrix} = \begin{pmatrix} \delta\underline{\gamma}^A & \delta(1 - \underline{\gamma}^A) \\ \delta(1 - \underline{\gamma}^B) & \delta\underline{\gamma}^B \end{pmatrix} \begin{pmatrix} V_{T-1}^{AA} \\ V_{T-1}^{BB} \end{pmatrix} + \begin{pmatrix} \omega^A - \delta(1 - \underline{\gamma}^A)\Theta_{T-1}^B \\ \omega^B - \delta(1 - \underline{\gamma}^B)\Theta_{T-1}^A \end{pmatrix} \quad (2.29)$$

(2.29) is the general expression for the payoffs of a game of length T , starting the iteration with $V_1^{AA} = \omega^A$ and $V_1^{BB} = \omega^B$. The eigenvalues of this transition matrix are δ and $\delta(\underline{\gamma}^A + \underline{\gamma}^B - 1)$ and hence they are both smaller than 1. Since the autonomous additive term converges, it is easy, but very tedious to show, that the payoffs converge to the invariant vector of this mapping with Θ_∞^B and Θ_∞^A . The expression for the invariant vector is thus:

$$\begin{pmatrix} V_*^{AA} \\ V_*^{BB} \end{pmatrix} = \begin{pmatrix} 1 - \delta\underline{\gamma}^A & -\delta(1 - \underline{\gamma}^A) \\ -\delta(1 - \underline{\gamma}^B) & 1 - \delta\underline{\gamma}^B \end{pmatrix}^{-1} \begin{pmatrix} \omega^A - \delta(1 - \underline{\gamma}^A)\Theta_\infty^B \\ \omega^B - \delta(1 - \underline{\gamma}^B)\Theta_\infty^A \end{pmatrix}$$

After some lengthy algebra, it turns out that:

$$\begin{pmatrix} V_*^{AA} \\ V_*^{BB} \end{pmatrix} = \frac{1}{1 - \delta} \begin{pmatrix} \omega^A \\ \omega^B \end{pmatrix} - \frac{1}{(1 - \delta)(1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B))} \begin{pmatrix} (1 - \delta\bar{\gamma}^B)\Phi^A + \delta(1 - \bar{\gamma}^A)(\Phi^B - \theta^A - R(\eta_*^B)) \\ (1 - \delta\bar{\gamma}^A)\Phi^B + \delta(1 - \bar{\gamma}^B)(\Phi^A - \theta^B - R(\eta_*^A)) \end{pmatrix}$$

Which are exactly the payoffs for the unique MPE of the infinite horizon game presented in Proposition 1.

2.8 Appendix 2: Comparative Statics

The expressions for the comparative statics of Φ^A with respect to the institutional parameters depend on the following partial derivatives:

$$\begin{aligned}
\frac{\partial \Phi^A}{\partial \Psi^A} &= \frac{(1 + \Psi^B)^2(\theta^A + R(\eta^{BB})) + (1 + \Psi^B)\Psi^B(\theta^B + R(\eta^{AA}))}{[1 + \Psi^A + \Psi^B]^2} > 0 \\
\frac{\partial \Phi^A}{\partial \Psi^B} &= \frac{\Psi^A(\theta^A + R(\eta^{BB})) + (1 + \Psi^A)\Psi^A(\theta^B + R(\eta^{AA}))}{[1 + \Psi^A + \Psi^B]^2} > 0 \\
\frac{\partial \Psi^A}{\partial \bar{\gamma}^A} &= \frac{\delta(1 - \delta\bar{\gamma}^B) + \delta^2(1 - \underline{\gamma}^A)}{[1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)]^2} > 0 \\
\frac{\partial \Psi^A}{\partial \underline{\gamma}^A} &= -\frac{\delta}{1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)} < 0 \\
\frac{\partial \Psi^A}{\partial \bar{\gamma}^B} &= \frac{\delta^2(\bar{\gamma}^A - \underline{\gamma}^A)}{[1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)]^2} > 0 \\
\frac{\partial \Psi^A}{\partial \underline{\gamma}^B} &= 0 \\
\frac{\partial \Psi^B}{\partial \bar{\gamma}^A} &= \frac{\delta^2(\bar{\gamma}^B - \underline{\gamma}^B)}{[1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)]^2} > 0 \\
\frac{\partial \Psi^B}{\partial \underline{\gamma}^A} &= 0 \\
\frac{\partial \Psi^B}{\partial \bar{\gamma}^B} &= \frac{\delta(1 - \delta\bar{\gamma}^A) + \delta^2(1 - \underline{\gamma}^B)}{[1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)]^2} > 0 \\
\frac{\partial \Psi^A}{\partial \underline{\gamma}^A} &= -\frac{\delta}{1 + \delta(1 - \bar{\gamma}^A - \bar{\gamma}^B)} < 0
\end{aligned}$$

Bibliography

- [1] ACEMOGLU, D. AND ROBINSON, J. 2004. "Economic Origins of Dictatorship and Democracy." Book Manuscript, forthcoming.
- [2] ACEMOGLU, D. ROBINSON, J. AND VERDIER, T. 2004. "Kleptocracy and Divide-and-Rule: a Model of Personal Rule." *Journal of the European Economic Association*, 2: 162-192.
- [3] AGHION, P., ALESINA, A. AND TREBBI, F. 2004. "Endogenous Political Institutions." *Quarterly Journal of Economics*, 119: 565-611
- [4] ALESINA, A., BAQIR, R. AND EASTERLY, W. 1999. "Public Goods and Ethnic Divisions." *Quarterly Journal of Economics*, 114: 1243-1284.
- [5] ALESINA, A., DEVLEESCHAUWER, A., EASTERLY, W., KURLAT, S. AND WACZIARG, R. 2003. "Fractionalization." *Journal of Economic Growth*, 8: 155-194.
- [6] ALESINA, A. AND LA FERRARA, E. 2003. "Ethnic Diversity and Economic Performance." Unpublished Manuscript, Harvard University.
- [7] ASSENSOH, A.B. AND ALEX-ASSENSOH, Y. 2001. *African Military History and Politics*. New York: Palgrave.
- [8] AYITTEY, G. 1992. *Africa Betrayed*. New York: St Martin's Press.
- [9] BARKAN, J. AND CHEGE, M. 1989. "Decentralizing the State: District Focus and the Politics of Reallocation in Kenya." *The Journal of Modern African Studies*, 27: 431-453.
- [10] BARRO, R. 1973. "The control of politicians: an economic model." *Public Choice*, 14: 19-42.

- [11] BARRO, R. 1999. "Determinants of Democracy." *The Journal of Political Economy*, 107: 158-183.
- [12] BATES, R. 1981. *Markets and States in Tropical Africa*. Berkeley: University of California Press.
- [13] BATES, R. 1983. "Modernization, Ethnic Competition, and the Rationality of Politics in Contemporary Africa." In *State versus Ethnic Claims: African Policy Dilemmas*, ed. Olurunsola, V. and Rothchild, D. Boulder, CO: Westview Press.
- [14] BATES, R. 1989. *Beyond the Miracle of the Market*. New York: Cambridge University Press.
- [15] BATES, R. 2000. "Ethnicity and Development in Africa: A Reappraisal." *American Economic Review*, 90: 131-134.
- [16] BATES, R. 2001 *Prosperity and Violence: The Political Economy of Development*. New York: W.W.Norton & Co.
- [17] BATES, R. AND LA FERRARA, E. 2001 "Political Competition in Weak States." *Economics and Politics*, 13: 159-184.
- [18] BUENO DE MESQUITA, B., MORROW, J., SIVERSON, R. AND SMITH, A. 2003 *The Logic of Political Survival*. Cambridge, MA: MIT Press.
- [19] CARTWRIGHT, J. 1983. *Political Leadership in Africa*. New York: St Martin's Press.
- [20] CASELLI, F. AND COLEMAN, J. 2002. "On the Theory of Ethnic Conflict." Unpublished Manuscript, Harvard University.
- [21] COLLIER, P. 2000 "Ethnicity, Politics and Economic Performance." *Economics and Politics*, 12: 225-245.
- [22] COLLIER, P. AND GARG, A. 1999. "On kin groups and wages in the Ghanaian labour market." *Oxford Bulletin of Economics and Statistics*, 61: 133-152.
- [23] COLLIER, P. AND GUNNING J.W. 1999 "Explaining African Economic Performance." *Journal of Economic Literature*, 37: 64-111.

- [24] COOPER, F. 2002. *Africa since 1940: The Past of the Present*. Cambridge: Cambridge University Press.
- [25] EASTERLY, W. AND LEVINE, R. 1997. "Africa's Growth Tragedy: Politics and Ethnic Divisions." *Quarterly Journal of Economics*, 111: 1203-1250.
- [26] EASTERLY, W. 2002. *The Elusive Quest for Growth: Economists' Adventures and Misadventures in the Tropics*. Cambridge, MA: MIT Press.
- [27] ELLMAN, M. AND WANTCHEKON, L. 2000. "Electoral Competition under the Threat of Political Unrest." *Quarterly Journal of Economics*, 115: 499-531.
- [28] FEARON, J. 1998 "Commitment Problems and the Spread of Ethnic Conflict." In *The International Spread of Ethnic Conflict*, ed. Lake, D. and Rothchild, D. Princeton, NJ: Princeton University Press.
- [29] FEARON, J. 2004 "Why Do Some Civil Wars Last So Much Longer Than Others?" *Journal of Peace Research* 41: 275-302.
- [30] FEARON, J. AND LAITIN, D. 1996. "Explaining inter Ethnic Cooperation." *American Political Science Review*, 90: 715-729.
- [31] FEARON, J. AND LAITIN, D. 2002. "Ethnicity, Insurgency and Civil War." *American Political Science Review*, 97: 75-90.
- [32] FERREJOHN, J. 1986. "Incumbent Performance and Electoral Control." *Public Choice*, 50: 5-26.
- [33] DE FIGUEIREDO, R. AND WEINGAST, B. 1999. "The Rationality of Fear: Political Opportunism and Ethnic Conflict." In *Civil Wars, Insecurity and Intervention*, ed. Snyder, J. and Walter, B. New York: Columbia University Press.
- [34] FUDENBERG, D. AND TIROLE, J. 1991. *Game Theory*. Cambridge, MA: MIT Press.
- [35] GARCIA-MONTALVO, J. AND REYNAL-QUEROL, M. 2002. "Why Ethnic Fractionalization? Polarization, Ethnic Conflict and Growth." Unpublished Manuscript, Universitat Pompeu Fabra.

- [36] GERSHENSON, D. AND GROSSMAN, H. 2000. "Civil Conflict: Ended or Never Ending?" *Journal of Conflict Resolution*, 44: 807-821.
- [37] GLAESER, E. 2002. "The Political Economy of Hatred." Unpublished Manuscript, Harvard University.
- [38] GROSSMAN, H. 1991. "A General Equilibrium Model of Insurrections." *American Economic Review*, 81: 921-921.
- [39] GROSSMAN, H. AND NOH, S. 1994. "Proprietary Public Finance and Economic Welfare." *Journal of Public Economics*, 53: 187-204.
- [40] HERBST, J. 2000. *States and Power in Africa*. Princeton, NJ: Princeton University Press.
- [41] HOROWITZ, D. 1985. *Ethnic Groups in Conflict*. Berkeley: University of California Press.
- [42] JACKSON, R. AND ROSBERG, C. 1982. *Personal Rule in Black Africa*. Berkeley: University of California Press.
- [43] LEMARCHAND, R. 1996. *Burundi: Ethnic Conflict and Genocide*. New York, NY: Cambridge University Press
- [44] MAURO, P. 1995. "Corruption and Growth." *Quarterly Journal of Economics*, 110: 681-712.
- [45] MBAKU, J.M. 2000. *Bureaucratic and Political Corruption in Africa*. Malabar, Fla: Krieger Publishing Company
- [46] MBAKU, J.M. 1998. *Corruption and the Crisis of Institutional Reforms in Africa*. Lewiston, NY: The Edwin Mellen Press
- [47] MIGDAL, J. 1988. *Strong Societies and Weak States*. Princeton, NJ: Princeton University Press
- [48] MIGUEL, E. AND GUGERTY, M. 2004. "Ethnic Diversity, Social Sanctions and Public Goods in Kenya." forthcoming, *Journal of Public Economics*

- [49] PERSSON, T. AND TABELLINI, G. 2000. *Political Economics: Explaining Economic Policy*. Cambridge: MIT Press
- [50] PRUNIER, G. 1995. *The Rwanda Crisis: History of a Genocide*. New York, NY: Columbia University Press.
- [51] ROBINSON, J. AND VERDIER, T. 2002. "The Political Economy of Clientelism." *CEPR Discussion Paper* no. 3205.
- [52] ROBINSON, J. AND TORVIK, R. 2002. "White Elephants." *CEPR Discussion Paper* no. 3459
- [53] ROBINSON, J., TORVIK, T. AND VERDIER, T. 2002. "Political Foundations of the Resource Curse." *CEPR Discussion Paper* no. 3422..
- [54] THROUP, D. AND HORNSBY, C. 1998. *Multi-Party Politics in Kenya*. Athens, Oh: Ohio University Press.
- [55] VAN DE WALLE, N. 2001. *The Politics of Permanent Crisis, 1979-1999*. Cambridge University Press.
- [56] WA WAMWERE, K. 2003. *Negative ethnicity: from bias to genocide*. New York: Seven Stories Press

Chapter 3

Legislative Effectiveness and Legislative Careers¹

3.1 Introduction

Good laws do not make themselves. They require inputs of time, energy, information, and thought. Holding hearings, drafting bills, amending bills, building coalitions, and investigating executive implementation are necessary parts of the process. Who does this work in U.S. legislatures? Which legislators are especially effective at the job of lawmaking? What are the determinants of effectiveness? Do legislators become more effective with experience, through learning-by-doing or by investing in specific human capital?

Viewed as a law-producing organization, an efficient legislature would allocate talent to where it is needed and productive. It would also employ incentive schemes that reward lawmakers who are diligent, skilled, and effective. In addition, voters would play a role, by rewarding effective legislators with reelection. If experience is an important component of legislative effectiveness, then reelection is important to permit legislators to gain experience. How efficient are U.S. legislatures in these terms? Do more effective legislators win reelection more often? Do they rise more quickly to positions of power inside legislatures? What is the relative importance of effectiveness and other factors, such as seniority or party loyalty?

¹This chapter is the result of joint work with Professor James M. Snyder.

We know little about the answers to these questions, in large part because we lack measures of the relative diligence, skill, or effectiveness of politicians. This paper exploits data on legislator “effectiveness” for the North Carolina House of Representatives for the period 1977-2001, collected by the North Carolina Center for Public Policy Research (NC Center). The NC Center surveys about 500 legislators, lobbyists, and journalists at the end of each “long” legislative session, and asks them to assess how effective each legislator was during that session.² The respondents were asked to order legislators according to their work in committees and on the floor, their general knowledge and expertise in special fields, their ability to influence the opinion of fellow legislators, and their general aptitude for the legislative process. The measure is probably the best available for any U.S. legislature.³

We view effectiveness as the product of three factors: (i) the intrinsic aptitude of a legislator, (ii) on-the-job learning or investing in specific legislative skills, and (iii) institutional positions a legislator holds, such as committee or party leadership positions, or membership in the majority party.⁴ Much of our analysis attempts to estimate the relative importance of each of the three factors.

Our findings are as follows. First, legislators who hold positions of power – committee chairs, vice-chairs and subcommittee chairs on the most important committees, chamber leadership posts, etc. – are more effective than those who do not. Second, members of the majority party are, on average, more effective than those in the minority.

Third, effectiveness rises sharply with tenure, at least for the first few terms, even after controlling for legislators’ institutional positions, party affiliation, and other factors. There is

²The NC state legislature has biennial regular sessions. These “long” sessions convene in January following each election. In addition, there have been special “short” sessions in virtually every even-numbered year since 1974.

³In 1992, State Policy Reports wrote: “Most attempts at reputational rankings of state legislators don’t deserve much credibility because of three problems: (1) no precise definition of who is being polled, (2) a low response rate among those polled because legislators and lobbyists don’t want to risk getting caught making statements suggesting people they work with are ineffective, or (3) definitions of effectiveness that equate effectiveness with helping to enact an interest group’s agenda... Over the years, Reports has seen many of these... that fail one or another of these tests. The exception is the rankings that have been done since 1978 by the North Carolina Center.” In 1996, *Governing* magazine (published by Congressional Quarterly, Inc.) wrote: “The ratings issued by the North Carolina Center for Public Policy Research are perhaps the most straightforward and most widely respected.” Rankings or partial rankings are available for some other states as well, including Arkansas, California, Florida, Texas, and Washington.

⁴We use the term aptitude broadly, to include not only abilities but also preferences. Some people enjoy legislative work and are willing to work hard at it, while others do not.

no evidence that effectiveness eventually declines with tenure, even out to nine terms. The impact of legislative experience on effectiveness is not simply due to electoral attrition and selective retirement, with higher-quality legislators being more likely to win reelection. Rather, the results suggest that the increased effectiveness is due to the acquisition of specific human capital, most likely through learning-by-doing.

Fourth, legislators who are more effective in their first term in office – arguably, a good measure of the aptitude for legislative work – are promoted more quickly to powerful positions in the chamber and in important committees. This indicates that positive sorting occurs, which is what we would expect in an efficient legislature.

Finally, effectiveness has a positive impact on incumbents' electoral success. Legislators who are more effective are less likely to be challenged and more likely to win reelection. They are also more likely to seek higher office, and more likely to win such office conditional on seeking it. Higher effectiveness also reduces the probability of retirement.

These findings have important implications for term limits, the incumbency advantage, seniority rule, and political accountability. We discuss these implications in section 8.

Before proceeding, we must acknowledge two limitations of the study. First, the analysis is limited to one state, so we must be cautious in drawing general conclusions about legislatures outside of North Carolina. Many of our findings are consistent with those of others studies, however, so we are willing to speculate about their broader implications. Second, although the effectiveness data for North Carolina is probably the best available for any legislature in the U.S., it is still based on subjective evaluations. More objective measures are clearly desirable. Unfortunately, the existing measures – such as those based on counts of bill activity, amendment activity or attendance – capture only a small part of effectiveness. One way to proceed in such a situation is to identify the relationships found using different measures, then focus on those that appear in study after study. Our paper could then be viewed as one small part of this broader enterprise.

3.2 Related Literature

As noted above, relatively little research has been done on the determinants or effects of individual legislator performance. There are, however, some notable exceptions.

Several papers use bill introduction and amendment activity to measure performance. Wawro (2000) uses sponsorship and co-sponsorship to construct “entrepreneurship” scores for all U.S. House members serving in the 94th-103rd Congresses. He finds that higher levels of entrepreneurial activity help Democratic representatives advance into leadership positions, but there is no effect for Republicans. Entrepreneurship does not appear to have a significant impact on voters’ evaluations or vote choices. Schiller (1995) also uses bill sponsorship to measure entrepreneurship, and studies the U.S. Senate during the 99th and 100th Congresses. She finds that senior senators sponsor more bills than junior members, as do senators who hold committee chairs or are chairs of a large number of subcommittees. Hamm et. al. (1983) find that leadership positions and seniority are strong predictors of legislative activity and bill success in the Texas and South Carolina state legislatures.

Other studies employ subjective measures of performance, or a mix of subjective and objective measures. One of the earliest is Francis (1962), who studies several determinants of “influence” in the Indiana state senate. More recently, Mayhew (2000) studies “prominent” actions taken by members of the U.S. Congress over a 200-year period. He finds that in recent decades legislators tend to have a large amount of experience – or at least seniority – before they take prominent legislative actions. DeGregorio (1997) surveyed 97 professional interest group advocates, and asked them to identify congressional “leaders” on six key bills passed during the 100th Congress. She reports that tenure, majority party status, holding a party leadership position, and membership on policy-relevant committees were significant predictors of whether a representative was identified as a leader. Luttbeg (1992) studies journalists’ rankings of legislators in several states, and finds that legislators with the highest rankings have a 12% higher probability of reelection than those with the lowest rankings. Meyer (1980) surveyed state representatives in North Carolina in 1973 to estimate the determinants of the “most influential” members.

Mondak (1995c) and Mondak and McCurley (1995) derive measures of “integrity,” “competence” and “quality” from content analysis of the descriptions of U.S. House members in the

Almanac of American Politics and *Politics in America*. Mondak (1995c) finds that low-quality incumbents are more likely to leave congress after a few terms, via voluntary retirement or electoral defeat. Quality also affects the level of challenger spending and vote-margins in primary elections. These effects seem to be driven more by competence than integrity. McCurley and Mondak (1995) focus on the link between incumbent quality and voters' opinions as revealed in the National Election Studies. They find that incumbent integrity directly influences both feeling thermometer scores and voting choices, while competence affects elections indirectly via the behavior of potential challengers.

Finally, two papers study North Carolina and use legislator effectiveness data from the NC Center. Weissert (1991) focuses on issue specialization, and finds that legislators who introduce bills on "salient" issues are rated as more effective than other legislators. Haynie (2002) focuses on racial discrimination, and finds evidence that black legislators are viewed as less effective than white legislators even after controlling for other factors. Both papers also find that effectiveness increases with seniority, and that it is higher for members who hold committee chairs or chamber leadership positions, for members of the majority party, and for members who introduce more bills. Lawyers also appear to be more effective.

Our results add to this literature in several ways. We have much more data on legislator performance than any of the studies above except Wawro (2000), Weissert (1991), and Haynie (2002). Our data also do not suffer as severely from potential sample selection issues as the data of Mondak and associates, since we have data on all legislators.⁵ Perhaps most importantly, we are able to follow legislators for many terms and study the dynamics of their legislative careers. Only Wawro (2000) conducts any dynamic analyses similar to ours below. This is mainly due to data limitations, of course – e.g., DeGregorio (1997) only has a snapshot of one congress, and Mondak (1995c) and McCurley and Mondak (1995) cannot construct a meaningful panel of congressional competence or integrity indices.

⁵They are able to assign scores on one or both attributes to 75% of the relevant sample (403 out of nearly 550). The missing congressmen are those for which neither the *Almanac of American Politics* nor *Politics in America* provided sufficiently detailed information. This is almost certainly a non-random subsample of individuals.

3.3 Data and Sources

As noted above, we study the North Carolina state legislature because it probably has the best available data on legislator effectiveness of any U.S. legislature.

3.3.1 A Bit of Background

The North Carolina legislature is called the General Assembly. It consists of two chambers, a House of Representatives with 120 members and a Senate with 50 members. All members are elected every two years for two-year terms. The General Assembly is typically described a hybrid – an amateur, citizens’ legislature with some professional characteristics. Regular legislative sessions are biennial, convening in January following each election. In addition, there have been special sessions or short sessions in virtually every even-numbered year since 1974. In 1986-88 the North Carolina legislature was ranked 22nd in terms of legislative professionalism, and in 1994-1996 it was ranked 28th (Squire, 1992, 2000). In 2001 legislative salaries were \$13,951 plus a \$104 per diem for living expenses. Legislative leaders earned substantially more – e.g., the Speaker of the House received a salary of \$38,151 and an expense allowance of \$16,956.⁶

The Democratic Party dominated the North Carolina General Assembly until very recently. Democrats held 86% of all state legislative seats during the period 1970-1979, 77% during 1980-1989, and 61% during 1990-1999. In 1994 Republicans won control of the state House for the first time in 100 years. They won again in 1996, but then lost in 1998.⁷ Internally, the legislature is organized mainly along party lines. The majority party controls all committee chairs, but some vice-chairs and subcommittee chairs go to the minority. Electorally, party organizations in North Carolina are stronger than in most other southern states, but typically rank just below the U.S. average (see, e.g., Cotter et al. (1984)). Morehouse (1981) classified North Carolina as a state in which pressure groups are strong.

⁶Despite its character as a citizens’ legislature, some observers argue that until recently the North Carolina General Assembly was one of the most powerful legislative bodies in the nation. This is due to the fact that until 1996 the governor of North Carolina had no veto.

⁷The 2002 elections produced an exact 50-50 split in the House, resulting in a unique system of shared control. Democrats controlled the state Senate throughout the period under study, but with a narrow 26-24 margin during 1995-1996.

3.3.2 Measuring Legislator Effectiveness

The data on legislator effectiveness comes from the North Carolina Center for Public Policy Research (NC Center), an independent non-partisan organization.⁸ At the end of each regular legislative session after the legislature has adjourned, the NC Center asks state legislators, lobbyists and legislative liaisons, and capital news correspondents to rate the “effectiveness” of each member of the General Assembly. According to the NC Center:

Ratings were to be based on their participation in committee work, their skill at guiding bills through floor debate, their general knowledge and expertise in special fields, the respect they command from their peers, the enthusiasm with which they execute various legislative responsibilities, the political power they hold (either by virtue of office, longevity, or personal attributes), their ability to sway the opinion of fellow legislators, and their aptitude for the overall legislative process. (From *Article II: A Guide to the 1991-1992 N.C. Legislature*, p. 212.)

The NC Center has conducted this survey continuously since 1977. The sample includes all 170 legislators, all lobbyists registered in the state capital who reside in North Carolina (250-325 lobbyists), and all journalists who regularly cover the state General Assembly (35-45 journalists), for a total sample size of 475-550.⁹ The NC Center publishes a ranking based on these ratings in its biennial handbooks, *Article II: A Guide to the N.C. Legislature*.

We focus on the North Carolina House of Representatives because it is larger. As noted above, this chamber has 120 members. Our main variable of interest is the effectiveness ranking of each representative in each session. A good descriptive title for this variable might be “Relative Legislative Performance,” but we use the shorter term *Effectiveness* in the text and tables below. We “invert” the ranking so that higher values mean greater effectiveness – thus, the highest ranked legislator in each session receives an *Effectiveness* value of 120, and the

⁸The NC Center was created in 1977. It is “an independent, nonprofit organization dedicated to the goals of a better-informed public and more effective, accountable, and responsive government” (see the URL: <http://www.nccppr.org/mission.html\#mission>).

⁹Response rates were only about 33% for the period 1977-1981, but have been over 50% since 1985. For more information see the North Carolina Political Review’s August 2002 interview with Ran Coble, executive director of the NC Center. The text of the interview can be found at URL: <http://www.ncpoliticalreview.com/0702/coble1.htm>.

lowest ranked legislator receives a value of 1.¹⁰

Some of our analyses use the effectiveness rankings legislators receive at the end of their first term of service. As noted above, this might serve as a measure of a legislator's general aptitude for legislative work. We call this *Effectiveness 1*.

As noted above, the main weakness of the *Effectiveness* rankings is that they are based on subjective evaluations. This disadvantage is offset by several desirable characteristics: Each ranking is based on a large number of evaluations; the evaluators are all legislative "specialists" of one sort or another; and the rankings are constructed in a consistent manner over a long period of time.

Two other facts about the rankings are encouraging. First, between 1977 and 1992 the NC Center reported the average evaluation that each representative received from each of the three types of respondents – legislators, lobbyists, and journalists – in addition to the overall evaluation and ranking. The correlations across the three separate scores are quite high: the correlation between the average rating by legislators and the average rating by lobbyists is .93, the correlation between the average rating by legislators and the average rating by journalists is .89, and the correlation between the average rating by lobbyists and the average rating by journalists is .91. Thus, various biases that we might imagine in the responses – e.g., lobbyists might systematically underrate legislators who oppose their positions, and legislators might systematically underrate members of the opposing party – do not appear to be a problem.

Second, the NC Center's *Article II* guides also contain information on the number of bills each member introduced, and how many of these became law. For representatives serving during the period 1981-2000, the correlation between *Effectiveness* and the number of bills introduced is .51, and the correlation between *Effectiveness* and the number of bills ratified is .50. Thus, the more objective measures of activity are strongly and positively related to *Effectiveness*. On the other hand, the correlation is far from 1, indicating that *Effectiveness* measures something other than simply introducing and passing bills.

¹⁰The ranking reported by the NC Center is constructed as follows: Let E_1 be the average evaluation a legislator receives from legislators, let E_2 be the average evaluation the legislator receives from lobbyists, let E_3 be the average evaluation a legislator receives from journalists, and let $\bar{E} = (E_1 + E_2 + E_3)/3$. Legislators are ranked according to the \bar{E} 's. Thus, the three groups of respondents – legislators, lobbyists, and journalists – are weighted equally.

Another issue is that *Effectiveness* is an ordinal variable, so attenuation bias may be a concern. Of course, this bias generally makes it more difficult to find statistically significant relationships, so we are not concerned that it introduces spurious correlations. Pooling the ordinal data across years could exacerbate the problem further. To address this, we include year-specific fixed effects in all analyses. We also include member-specific fixed member-specific effects in most of our analyses – thus, our identification is based mainly on changes in members’ rankings over time. In addition, for a subset of years we can use the “raw” average effectiveness evaluations rather than rankings. These probably suffer less from the problems associated with ordinal data. Using the raw evaluations, we obtain qualitatively similar results to those reported below.

3.3.3 Other Variables

Our analyses require other measures as well, including election outcomes and contestation rates, party affiliations, committee assignments and leadership posts, legislative tenure, and roll call voting records. These variables are all described in Table A.1, with summary statistics given in Table A.2.

Data on committee assignments, leadership posts, and tenure are from the NC Center’s *Article II* guides and from various editions of the *North Carolina Manual*. These books contains a complete list of each legislator’s committee assignments and major subcommittee assignments, including information about whether the member served as chairman, co-chairman, vice chairman, or ranking member. In addition, the NC Center’s survey provides information about the relative importance of different committees. Each respondent was asked to name the five or six “most powerful” committees in both houses. The most powerful committees almost always included Appropriations, Finance, Judiciary I, and Rules, and Education from 1989 onward.¹¹

We construct the variable *Chamber Leader* to indicate legislators who held one of the following positions: Speaker of the House, Majority Leader, Minority Leader, Deputy Speaker of the House, Majority Whip, and Minority Whip. We also construct several committee leadership variables, including *Chair of Power Committee*, *Leader of Power Committee*, and *Chair of*

¹¹Other committees appeared on the list in particular years – e.g., Judiciary III in 1983 and Judiciary IV in 2001. In 1991, a redistricting year, the Redistricting committees were among the top six. Respondents were also asked to name the “most influential” lobbyists.

Other Committee. We define *Tenure* as the number of terms a legislator has served continuously in the state House, including the present term. We also define several dummy variables: *Tenure 1* = 1 for freshman, *Tenure 2* = 1 for sophomores, and so on. We employ two party variables, *Democrat* and *Majority Party*. Democrats controlled the House from 1979-1994 and again from 1999-2000, but the Republicans controlled it during the period 1995-1998. In some specifications we include certain personal characteristics of members: *Age*, *Age at Entry*, *Lawyer*, and *Previous Service*. This information was collected from various editions of the *North Carolina Manual*.

In order to estimate the impact of effectiveness on election outcomes, we must control for the “normal vote” in each legislative district (Converse, 1966). We use the votes cast in statewide offices to estimate the *Normal Vote*. Due to redistricting we have three different sets of districts, and due to data limitations we use three slightly different sets of statewide offices for the three periods.¹²

Finally, to measure election outcomes we collected general election data on all candidates running for the North Carolina General Assembly during the period 1976-2000. We obtained this data from ICPSR Study Number 8907, and from the official election results published by the North Carolina State Board of Elections. We used this data to construct several measures, including *Uncontested*, and *Reelected*. We also found all cases where a state representative ran for a statewide office, the U.S. Congress, or the state senate, and created the variable *Sought Higher Office*.¹³

¹²For 1978-1980 we calculate the average Democratic share of the two-party vote for governor, senator, and president, using county-level data. (Prior to 1982, no counties were split across state house districts, but larger counties elected all their state legislators at-large.) The data are from ICPSR Study Number 13. For 1982-1990 we calculate the average Democratic share of the two-party vote for all available statewide races held during the period 1984-1990. These offices are: U.S. Senator, Governor, Lieutenant Governor, Secretary of State, Treasurer, Auditor, Attorney General, Commissioner of Agriculture, Commissioner of Insurance, Commissioner of Labor, and Superintendent of Public Instruction. Due to a redistricting between the 1982 and 1984 elections, we can only estimate the Normal Vote for 87% of the 1982 House districts. There was yet another redistricting in 1985, but in this case the court simply ordered the merging of three House districts into a single district. We aggregated precinct-level data to the legislative district level; the precinct-level data are from the *Record of American Democracy* (ROAD) database. For 1992-2000 we calculate the average Democratic share of the two-party vote for all statewide elected offices in the 2000 election. Again, we aggregated precinct-level data to the legislative district level; the precinct-level data are from the North Carolina State Board of Elections (URL: <http://www.sboe.state.nc.us>).

¹³We obtained some of this data in reports from the NC State Board of Elections and the NC State Legislative Library, and we extracted some from the URL: <http://www.sboe.state.nc.us>.

3.4 The Determinants of Average Effectiveness

We begin by studying the determinants of average *Effectiveness* in the legislature. Since we observe most legislators for two or more terms, the data have a panel structure. We exploit this by estimating fixed effects and random effects models, with an individual effect for each legislator. The panel is unbalanced, however, so it must be treated with some care. We address this in more detail in section 5.

From a theoretical point of view, we consider *Effectiveness* as the relative “output” of a representative during a term. The production function used to generate this output employs three conceptually different factors. The first factor is a member’s intrinsic capability or aptitude for legislative work. The main way we capture this is by using legislator-specific fixed effects. Alternatively, in some specifications we use random effects and also include measures of some of the characteristics that common sense or previous research suggests should affect ability, including occupation, age, and prior service. The second factor is a member’s portfolio of formal leadership positions in the legislature. Party leaders, committee chairs and vice-chairs, subcommittee chairs, and members of the most powerful committees are likely to be more effective at passing and blocking legislation than other legislators. Members of the majority party may also have an advantage in building winning coalitions for their proposals. The third factor is experience, which should affect performance through learning-by-doing or investment in skills and knowledge specific to the legislature.

In Table 1 we attempt to isolate the effects of these three sets of variables. The table reports regression results with *Effectiveness* as the dependent variable for various sub-samples. The first two columns pool all representatives present in the House from 1977 to 2001. Columns 3-6 compare the parties’ delegations. Columns 1, 3 and 5 present fixed effects estimates, and columns 2, 4 and 6 contain random effects estimates. The Hausman specification tests typically reject the null hypothesis that the individual effects are orthogonal to the regressors. We report the random effects results nonetheless, because they allow us to gauge the impact of individual characteristics that are time invariant. The fact that the coefficients do not vary much between the specifications gives us some confidence that the random effects estimates are meaningful.

Not surprisingly, legislators who hold the top leadership posts – chamber leaders and chairs of the five most powerful committees – tend to be rated among the most effective. These posts

are worth about 12-16 positions on the ranking scale (1-120). Other leadership posts, which include chairs of less important committees, also have significant effects in the range of 6-8 positions. The magnitude of these coefficients appears somewhat higher for Republicans, which had minority status for most of the period, but the differences across parties are not statistically significant.

Membership in the majority party also has a large, positive impact on *Effectiveness*. We can estimate this even with individual fixed effects by exploiting the switches in majority party control that occurred in 1994 and again in 1998. Republicans took control following the 1994 elections, and Democrats regained control after the 1998 elections. The coefficients show that majority party status increases a legislator's ranking by 20 positions, a large jump. This is even larger than the effect of becoming a chamber leader or powerful committee chair.¹⁴

This finding deserves special attention in view of the ongoing debate about whether and how parties matter in U.S. politics. Rohde (1991), Aldrich (1995), Aldrich and Rohde (2000, 2001), and others argue that members of the majority party in the U.S. Congress are advantaged due to their ability to organize the chamber. Cox and McCubbins (1993, 2002) argue that the majority party uses its power to control the legislative floor agenda. In contrast, Krehbiel (1993, 1998, 1999) and others argue that the majority party in Congress has little agenda control, and that majority party status confers few policy-relevant benefits.

Our findings support the view that being in the majority party does matter.¹⁵ The large effect of majority party status is especially interesting because North Carolina is not known as a "strong party" state. Party affiliation may have an even larger impact in other states.

The random effects estimates indicate that lawyers are especially effective legislators. Weisert (1991) found this previously. It is not surprising that lawyers are more effective, since legislators make laws and lawyers have years of specialized training in the theory and application of law, legal jargon, and so on.¹⁶ What is surprising is the magnitude of the effect – for

¹⁴The year coefficients for 1994 and 1996 are significantly different than the rest of coefficients in the nineties for columns 3-6 – smaller for Democrats and larger for Republicans – indicating the presence of majority party effects.

¹⁵Ansolahehere and Snyder (1999) and Cox and Magar (1999) find that majority party status matters for campaign contributions, which could be related to power.

¹⁶An anonymous referee suggested that lawyers may be especially effective because they have experience in, and an affinity for, the process of formalized dispute. In contrast, businessmen are accustomed to making unilateral, executive decisions.

example, being a lawyer appears to have a larger impact on *Effectiveness* than being the chair of a powerful committee.

Previous service in the state legislature only appears to matter for Democrats. This may be a consequence of the fact that Democrats had large majorities in both chambers until the late 1980s and 1990s, giving them a larger pool of candidates with prior experience. The same is true for the variable *Age at Entry*.

The first set of variables in Table 1 captures the effects of experience. The coefficients on the *Tenure* variables are large and highly significant in all specifications. Legislators in their second term are on average 17 positions ahead of their freshmen counterparts, and legislators in their fourth term are 30 positions ahead. Experience yields diminishing returns, and after five terms additional experience has at best a small impact on effectiveness. Importantly, however, we find no evidence that effectiveness eventually declines with tenure. Also, we never reject the hypothesis that the *Tenure* coefficients are the same in both parties.

The results show the magnitude of experience effects is first order. For example, having one term of experience is already more important than holding a powerful committee chair, and slightly less than being in the majority party. In the next section we explore the source and character of these experience effects.

Finally, Table 2 shows results for the NC state Senate, analogous to those of columns 1 and 2 in Table 1. The results are qualitatively similar to those for NC House. In particular, *Effectiveness* rises sharply with tenure in the first few terms, even controlling for leadership positions. We cannot confidently identify the effect of majority party status, however, because the Senate was under Democratic control throughout the period. Note that it is misleading to directly compare the coefficients in Tables 1 and 2, because the chambers differ in size, and the dependent variables have different scales (the range of *Effectiveness* is 1-120 in the House and 1-50 in the Senate).

3.5 Effectiveness and Tenure

The estimates in Table 1 show clearly that average relative performance in the legislature increases with experience, even controlling for institutional leadership positions, majority party

status, and other factors. This increase in effectiveness could reflect a real increase in legislative abilities. Alternatively, the increase might simply reflect selective re-election and retirements. If the electoral process is good at weeding out under-performing politicians and/or those who are not effective retire earlier (perhaps because they do not enjoy the job), then average performance could rise with seniority simply as a consequence of selection.

To isolate the effects of electoral selection and retirement, we estimate specifications similar to those in Table 1, but restrict the sample to the set of legislators first elected between 1976 and 1994 who served four consecutive terms in the House of Representatives. Also, we only include the observations on the first four terms served for each of these legislators. The result is a balanced panel about which we can make more meaningful conditional statements.

Table 3 presents the results. Columns 1 and 2 show the same specification of Table 1 using the restricted sample. Again, we present random effects and fixed effects estimates. Columns 3 and 4 show fixed effects estimates for each party separately.

Looking first at columns 1 and 2, the estimates show clearly that conditional on serving at least four terms in the legislature, a legislator's effectiveness rating increases with tenure, even controlling for institutional positions. Average relative performance increases sharply between the first period and the second, and again between the second period and the third; it increases again, but more gradually, from the third period to the fourth. The coefficients from the random effects model are close to those in Table 1. The coefficients from the fixed effects model imply an even steeper profile. This indicates that the positive effect experience has on effectiveness is not due primarily to electoral selection and selective retirements. Surviving legislators become more effective with experience.

The coefficients on the committee leadership variables are somewhat smaller than in the unrestricted sample, but the coefficient on *Chamber Leader* is larger. This might reflect the fact that very few representatives obtain chamber leadership positions early in their legislative career. The estimated effect of being a member of the majority party is similar to that in the unrestricted sample.

The estimates in columns 3 and 4 suggest that tenure has a larger impact on Republicans than Democrats, but the differences are not statistically significant.

Since the effect of experience on effectiveness is so large, we would like to know more

about its nature. The literature on agency theory provides two main possibilities. The first is learning-by-doing. Legislators might acquire important knowledge and skills simply by being in the General Assembly – watching how other legislators write bills and push them through the process, participating in committee hearings, mark-up sessions, and floor debates, and so on. Another possibility is that the experience effect reflects costly investment decisions – extra time and energy spent learning the legislative process that could be spent on other activities.

Which of these dominates matters for some policy decisions and questions of institutional design. For example, our findings imply that term limits entail a large loss of legislative-specific human capital, simply by reducing the experience of the average legislator. However, if the human is acquired mainly through costly investments, then the loss due to term limits would be greatly compounded by reducing legislators' incentives to make the required investments. Another implication is that if legislative human capital is costly to acquire, then legislative leaders, and voters, must provide positive incentives to induce legislators to make the investment. This is less important if learning-by-doing is at work.

To assess these two hypotheses, we separate legislators into different groups that *ex ante* should have different incentives to invest. The results of this are shown in Table 4. The specifications presented in the table include individual fixed effects (random effects regressions produce qualitatively similar results).

In column 1 we test whether legislators who are younger when they first enter the House have steeper effectiveness-experience profiles (thus, *Group* = 1 for those with *Age of Entry* < 50, and *Non-Group* = 1 for those with *Age of Entry* > 50. Younger legislators should expect to have longer legislative careers, and may be more likely to consider the state House as a stepping-stone in their political careers. If so, they have a greater incentive to invest, and should have steeper effectiveness-experience profiles. As the coefficients and F-statistic in the table show, however, we cannot reject that the profiles are the same for both groups.

Column 2 shows the results of another test. Here we compare the effectiveness-experience profiles of Democrats and Republicans in the period up to 1992. This was a period of Democratic dominance. The returns to investing in legislative skills should be higher for members of a dominant majority party, because *ceteris paribus*, their bills are more likely to pass. For example, over the period 1983-1990, Democrats in the House introduced an average of 22.8

bills per legislator, 7.6 of which were ratified; Republicans introduced 8.5 bills per legislator, 2.2 of which were ratified. Examining Table 4, the investment hypothesis again fares poorly. The effectiveness-experience profiles of Democrats and Republicans look similar, and the F-test does not reject the hypothesis that they are the same.

The tests above are not very strong, so we hesitate to draw strong conclusions. Tentatively, however, the evidence suggests that most of the increase in performance that comes from experience is due to learning-by-doing on the job.

Can we say anything about what legislators learn? In column 3, we test whether legislators with previous legislative service have flatter effectiveness-tenure profiles than newcomers (thus, *Group* = 1 for those *Previous Service* = 1, and *Non-Group* = 1 for those with *Previous Service* = 0). This is in fact the case, and we can reject the hypothesis that there is no difference between the groups at the 10% confidence level. Legislators with previous service begin with a higher effectiveness ranking than those without previous service (see Table 1), but their ranking grows more slowly with additional experience. The pattern is consistent with the hypothesis that the newcomers are “catching up,” learning things that those with previous service have already learned. This suggests that at least part of what is learned is knowledge specific to the General Assembly.

Column 4 shows yet another cut at the data. If the knowledge acquired in the legislature is related purely to technical aspects of law-making – legal jargon, the structure of existing law, etc. – then lawyers should begin with higher effectiveness rankings, but have flatter profiles, because they already possess much of this knowledge. Table 1 shows that lawyers are more effective, but column 4 of Table 4 shows that their effectiveness-experience profiles are just as steep as those of non-lawyers. Lawyers are simply more effective legislators throughout their careers. This suggests that legal technicalities are not at the core of what legislators learn with experience.

Of course, there are many other possibilities. Legislators might acquire detailed knowledge about particular policy areas – budgeting, taxation, transportation, education, health care, social services, etc. – and how different policies interact; they might learn who is who and who knows what in the executive branch; the preferences and personalities of other legislators and how to bargain with them; who are potential partners in promoting different kinds of bills; and

which staffers are more efficient and get the work done.

3.6 Allocating Positions of Power

In an efficient legislature, the most talented legislators should obtain important leadership positions sooner than less talented individuals. An efficient legislature should also allocate important positions on the basis of previous performance. How efficient is the North Carolina House of Representatives in these terms?

To assess the first of these criteria, we need a measure of “talent.” We use the effectiveness rating a legislator receives in his or her first term. This is arguably a good measure of a member’s relative aptitude for legislative work, where aptitude is interpreted broadly to include skills, drive, personality, and how much the member enjoys legislative tasks. As noted above, the ranking is done at the end of the first “long session” in which a legislator serves, so legislators, lobbyists and journalists have had some time to see the legislator at work. However, almost no legislators hold powerful positions in their first term, so the initial ratings are not influenced by variations in institutional power.

We examine whether legislators with high initial effectiveness evaluations advance to powerful committee positions more quickly than other legislators. We focus on the dependent variable *Power Committee Leader*, which is 1 for the chairs, vice-chairs and subcommittee chairs of the five most powerful committees in each chamber. Since this is a dichotomous variable, we run probit regressions. To control for seniority effects (as well as selection issues due to attrition), we estimate models for legislators with the same amount of tenure. We consider three subsamples: legislators in their second term, those in their third term, and those in their fourth term.

Table 5 presents the results. The first three columns show the effect of increased aptitude on the probability of attaining a powerful committee position by a legislator’s second, third or fourth term. For legislators in their second and third terms, *Effectiveness 1* has a significant and positive effect. This effect does not appear in the fourth term, but the sample is small. The estimated effects in the second and third terms are quite large. Consider the third term. Holding all other variables at their mean values, an increase in *Effectiveness 1* from one-half

of a standard deviation below the mean to one-half of a standard deviation above the mean (24 points, in the relevant sub-sample), increases the probability a legislator is promoted to a powerful committee position from .22 to .31, a 50% increase.¹⁷

In columns 4 and 5 we examine the effect of previous performance on the probability of attaining a powerful committee position by a legislator's third or fourth term. The independent variable of interest in these specifications is *Lagged Effectiveness* (the lag is one period). This variable is statistically and substantively significant in both the third and fourth terms. For example, legislators with higher effectiveness rankings in their second term are more likely to be promoted to a powerful committee leadership positions in their third term. Interestingly, columns 3 and 5 in the table imply that although the impact of *Effectiveness 1* has faded by the fourth term, recent effectiveness still matters for promotions.

Clearly, we also expect seniority to be strongly related to promotions. Table 6 shows the relative importance of seniority and aptitude, where aptitude is again measured using *Effectiveness 1*. We divide the sample into *Low* and *High* initial effectiveness categories, splitting each cohort at the median. Looking across the columns of the table, we see that seniority has a large influence on the probability a legislator attains a powerful committee position. Looking down the rows, we see that initial effectiveness also matters. In particular, having a *High* value of *Effectiveness 1* increases a legislator's probability of promotion by an amount that is approximately equal to one additional term of service.¹⁸

Overall, seniority dominates the internal promotion process. Since tenure is strongly related to effectiveness, seniority rule might actually be a good way to allocate top committee and party leadership posts. We can use our data to calculate the relative efficiency of different promotion procedures.¹⁹ A completely random allocation of posts would produce a group of

¹⁷Separate analyses by party confirm the results in Table 5. For example, for legislators in their second term the estimated coefficient on *Effectiveness 1* is .016 for Democrats and .023 for Republicans. Both are statistically significant at the .05 level.

¹⁸The attrition rates shown in Table 6 exhibit an interesting pattern. Legislators with *Low* aptitude are almost as likely to survive four terms in the legislature as those with *High* aptitude. However, a noticeably larger fraction of the *Low*-aptitude legislators leave the legislature after only one term of service. This suggests that the nature of the attrition processes is different for the two groups. For example, *Low*-aptitude legislators might tend to lose elections or retire, and *High*-aptitude legislators might tend to seek higher offices, which are not offered to inexperienced politicians.

¹⁹For this exercise we include party leaders as well as committee leaders. That is, we consider all posts for which *Power Committee Leader* = 1 or *Chamber Leader* = 1.

powerful committee and party leaders with an average effectiveness ranking of 60.0. The first-best allocation – i.e. allocating posts to the legislators with the highest “intrinsic effectiveness” rankings – would produce an average effectiveness of 81.3.²⁰ Strict adherence to seniority rule would produce an average effectiveness of 72.4. In the data, the actual average effectiveness ranking for committee and party leaders is 73.0. Thus, seniority rule is closer to the fully efficient outcome than to the outcome under a random allocation. The chamber does even better in practice – though not by much.

3.7 Effectiveness and Reelection

In this section we explore whether being a more effective representative yields electoral or other career benefits.

The heavy use of first-past-the-post, multi-member districts in the North Carolina state legislature complicates the study of electoral outcomes. In addition, many races are fully or partially uncontested. Analyses with vote-share as the dependent variable must drop these cases, and doing so is likely to introduce selection bias. We therefore focus on two other electoral outcome variables: *Reelected* and *Unopposed*. We also present one tentative analysis with total votes as the dependent variable. In addition, we study two “career” variables: *Sought Higher Office* and *Retired*.²¹

Tables 6 contain the results for the electoral outcome variables.²² The first two columns examine whether being effective helps in a reelection bid. In the first column the sample consists of all NC House representatives who seek reelection. In the second column we restrict attention to freshmen seeking reelection, to avoid potential selection bias. In both cases *Effectiveness* has a strong, positive impact on reelection. Holding all other variables at their means, a one-

²⁰To measure each legislator’s “intrinsic effectiveness,” we regress *Effectiveness* on all of the variables in column 1 of Table 1 other than the *Tenure* variables, and take the legislator-specific fixed effects. Note that while this is a reasonable theoretical benchmark it is almost surely unattainable in practice.

²¹It would be interesting to study the cases where a state representative runs against a state senator and we have *Effectiveness* evaluations for both candidates, but there are too few such cases in our sample.

²²Three caveats must be mentioned. First, we do not have a good measure of challenger “quality,” so there is some danger of omitted variable bias. Second, incumbents may retire strategically in order to avoid a probable defeat, leading to selection bias. Third, *Effectiveness* only refers to the legislative process, and ignores other political activity such as casework (this likely leads to attenuation bias in our estimates). Previous analyses of state legislative elections have ignored these issues, except possibly to note that they are potential problems (e.g. Holbrook and Tidmarch, 1991; King, 1991; Cox and Morgenstern, 1993, 1995).

standard-deviation increase in *Effectiveness* (34 positions) centered on the mean increases the probability of reelection from 89% to 95%. This effect is magnified over the course of a career. For example, it translates into a 16 percentage point increase in the probability of winning three elections in a row, from 70% to 86%.²³

As expected, *Normal Vote* has a strong effect as well. Most other variables are insignificant. These findings are consistent with studies of congressional races, which typically find that institutional positions have little independent effect on election outcomes.²⁴

In columns 3 and 4 we study the probability a legislator is unopposed. The results show that higher *Effectiveness* significantly decreases the chances a legislator is challenged.²⁵ Using the coefficients from column 3, a one-standard-deviation increase in *Effectiveness* centered at the mean reduces the probability of being challenged by 10 percentage points, from 67% to 57%. As expected, *Normal Vote* also has an important impact on contestation, because it reduces the chances that a challenge is successful.

We can exploit multi-member districts to study the impact of *Effectiveness* on total votes, at least for a subset of cases. This is shown in the last column in Table 7. We pool all multi-member districts in the sample, and regress the total votes received by each incumbent on *Effectiveness* and *Tenure*. We control for all other characteristics of a race by including a fixed effect for each party in each district in each year. Thus, we compare the votes of equally experienced incumbents from the same party who are running against one another in the same district in the same year. The estimates imply that a one-standard deviation increase in *Effectiveness* (34 positions) increases an incumbent's expected vote by about 500 votes. This represents 2% of the average vote received, or about one-third of the median incumbency advantage estimated for state legislators nationwide.²⁶

Legislative effectiveness might have a larger impact on elections in North Carolina than in other states, precisely because a respected set of rankings exists. In North Carolina, the rankings are even used in campaign advertising.²⁷ This might explain why our findings differ

²³In the case of freshmen, the probability of reelection increases from 82% to 87%, and the probability of winning three consecutive terms increases from 55% to 66%. Our findings are similar to Luttbegg (1992).

²⁴See, e.g. Bullock (1972) and Fowler, Douglass, and Clark (1980).

²⁵This is consistent with Mondak (1995c).

²⁶See King (1991) and Cox and Morgenstern (1993,1995).

²⁷Informing citizens about their representatives' performance is, in fact, a goal of the NC Center.

from those of other scholars, such as Wawro (2000) who finds that bill sponsorship in the U.S. House is unrelated to reelection.

Table 8 examines the relationship between *Effectiveness* and career decisions taken by legislators. Columns 1 and 2 examine the decision to retire from politics. Higher *Effectiveness* appears to reduce the propensity to retire for the whole sample, but not for freshmen.²⁸ Interestingly, *Age* is not a good predictor of retirement, but *Tenure* is.²⁹

A similar picture arises in columns 3 and 4 where we examine the impact of *Effectiveness* on the decision to run for a higher office (whether the bid is successful or not). The results show that this effect is significant for the whole sample, but not for freshman. This points to another benefit of being an effective legislator: access to higher positions for those with progressive ambition. Overall, this set of results suggests that more effective legislators retire less often and seek higher office with higher probability.

3.8 Discussion and Conclusions

In this paper we study an under-utilized source of data on legislative effectiveness. The data can be used to measure both the performance and aptitude of legislators. Our analysis reveals several interesting patterns. First, legislators' effectiveness increase sharply during the first few terms of service. This finding is quite robust, and holds even after controlling for institutional positions and electoral selection. The increasing performance appears to be due mainly to learning-by-doing rather than costly investment in specific skills. Second, belonging to the majority party in the legislature increases legislator's performance over and above access to more powerful positions (at least in the NC House of Representatives). Third, the NC House appears to use both past performance and seniority as criteria for allocating positions of power; but, since performance increases with tenure, the system behaves closely to one governed by a pure seniority rule. Fourth, superior effectiveness yields electoral benefits in the form of higher reelection rates and a higher probability of being unchallenged. Also, more effective legislators tend to seek higher offices more often, and retire less quickly.

²⁸We hesitate to give a causal interpretation of this coefficient, because legislators who are planning to retire may shirk.

²⁹This is consistent with Kiewiet and Zeng (1993).

These findings have important implications for arguments about term limits, the incumbency advantage, and seniority rule.

We make three comments on term limits. First, the fact that elections tend to oust ineffective legislators more often than effective ones means that term limits may not be necessary as a mechanism for weeding out under-performing legislators, at least in North Carolina.³⁰ Second, the fact that legislative effectiveness increases sharply during the first few terms of the typical legislator's career means that term limits might impose substantial costs in the form of lost capability and expertise. We cannot estimate the magnitude of the loss because our data are only ordinal. However, a simple calculation suggests that the losses are not trivial. On average, about 29% of the representatives in North Carolina are serving their 5th or higher term. If a term limit of four terms implied that all of these members would be replaced with freshmen, then the NC House would lose nearly 50% of its "person-years" of effective experience.³¹ Third, the fact that high-skilled legislators are more likely to attain powerful positions on key committees and inside party leaderships further increases the costs of term limits. The key committees have jurisdiction over crucial policies – the tax code, state spending priorities, constitutional issues – where poor decisions and poorly written laws are likely to impose especially high social costs. It is therefore important to fill these positions with highly competent legislators, and having found such legislators it is costly to remove them via term limits.

Of course, our findings do not establish that term limits would do more harm than good. A thorough analysis must go much further in quantifying the costs, and must then balance these costs against the potential benefits, such as the possibility that long periods of service lead legislators to adopt an inside-the-capitol view of public policies that does not reflect the views of their constituents.

The fact that effectiveness rises with tenure may help account for the incumbency advantage in legislative elections. If voters care about their legislator's effectiveness, then there will be

³⁰See Mondak (1995a, 1995b) and Petracca (1995) for a discussion of the potential effects of term limits on average quality of the legislature.

³¹The calculation is as follows: On average, 23% of all representatives are freshmen, 20% are sophomores, 16% are in their 3rd term, 12% are in their 4th term, and 29% are in their 5th or higher term. Assign "years of effective experience" as follows: freshmen = 0, sophomores = 1, 3rd term = 2, 4th term or higher = 3. Then the average number of "years of effective experience" in the NC House is 208.6. Turning all those with 5+ terms into freshmen would reduce this to 105.3, a drop of 49.5%. Gilmour and Rothstein (1994) analyze this effect of term limits.

an electoral bias in favor of incumbents that is due simply to their accumulated experience. The fact that effectiveness increases steeply with experience during the first few terms but then levels-off is also broadly similar to the patterns observed in estimates of the incumbency advantage over legislators' careers. For example, Hibbing (1991) and Ansolabehere et al. (2000) find that in the U.S. House the typical incumbent's vote grows quickly over the first few election cycles but then hits a plateau.

Our results help evaluate the costs and benefits of seniority rule. A system that promotes legislators to powerful positions purely on the basis of seniority is almost surely sub-optimal, because legislators have different skills and preferences for legislative work. As our calculations suggest, however, since effectiveness grows with experience, it is reasonably efficient to use seniority as the main criterion for promotion.

Our results also reveal an important omission in the theoretical literature on electoral accountability and selection. This large and growing body of work models the interactions between voters and politicians as a principal-agent relationship, focusing on the ability of voters to hold politicians accountable and/or choose "good" politicians.³² None of the existing models incorporate learning-by-doing by politicians. Some of these models, such as Banks and Sundaram (1993), even predict that performance will diminish over politician's career. Our findings suggest that the reduction in effort associated with the logic of career concerns is more than offset by learning how to do legislative work, resulting in increasing performance over time.

Finally, there is much more to learn using the NC Center's data. We find that prior performance helps legislators attain positions of power, but what about other factor such as party loyalty? Cox and McCubbins (1993) and others argue that party leaders in the U.S. House allocate committee chairs and other powerful positions to those who vote along party lines. Is this true for the NC House? More interestingly, what is the relative importance of loyalty and effectiveness? Many other questions come to mind as well. Are ideologically moderate legislators, who may be better positioned to forge legislative coalitions, more effective? Are lobbyists' evaluations more closely related to campaign donations from special interests? Are journalists' evaluations more reflective of the "public interest"? Are more effective legislators better at bringing home the bacon? Do multi-member districts lead to less accountability and thereby

³²See, for example, Persson and Tabellini (2000), Chapter 4, and the cites therein.

less effectiveness? What about marginal vs. safe districts? Does the lack of competition in the general election produce legislators that are less effective? Or are primaries just as good at weeding out ineffective politicians? Work that merges the effectiveness ratings with other data – roll calls, campaign contributions, and state government spending – should generate interesting insights about internal legislative politics, electoral accountability, and selection.

Appendix Table A.1: Variable Definitions

Variable	Definition
<i>Effectiveness</i>	inverse of effectiveness rank; = 120 for the top-ranked house member, and 1 for lowest-ranked member
<i>Effectiveness 1</i>	legislator's Effectiveness at the end of his or her first term
<i>Power Committee Chair</i>	1 if legislator is chair or co-chair of one of 5 most powerful committees
<i>Power Committee Vice Chair</i>	1 if legislator is vice chair or ranking member of one of 5 most powerful committees, or chair of Appropriations subcommittee
<i>Power Committee Leader</i>	Max(Chair of Power Committee, Vice Chair of Power Committee)
<i>Number of Power Committees</i>	number of Power committees on which a legislator serves
<i>Other Committee Chair</i>	1 if legislator is chair of a committee that is not one of 5 most powerful committees
<i>Other Committee Vice Chair</i>	1 if legislator is vice chair or ranking member of a committee that is not one of 5 most powerful committees
<i>Chamber Leader</i>	1 if legislator is Speaker of the House, President Pro Tempore of the Senate, Majority Leader, Minority Leader, Deputy Speaker, Deputy President Pro Tem., Majority Whip, or Minority Whip
<i>Democrat</i>	1 if legislator is a Democrat
<i>Majority Party</i>	1 if legislator is member of majority party
<i>Lawyer</i>	1 if legislator is a lawyer
<i>Previous Service</i>	1 if legislator has served previously in the NC General Assembly, and service ended 3 or more years before beginning of current term
<i>Age</i>	legislator's age
<i>Age at Entry</i>	legislator's age in freshman year
<i>Tenure</i>	number of terms legislator has served in chamber including current term
<i>Tenure 1, Tenure 2, etc.</i>	1 if legislator is in his or her first term (a freshman), 1 if legislator is in his or her second term, <i>etc.</i>
<i>Tenure 5+</i>	1 if legislator is in his or her fifth or higher term
<i>Normal Vote</i>	normal vote measures using election for statewide offices; see text
<i>Uncontested</i>	1 if legislator seeks reelection and is uncontested
<i>Reelected</i>	1 if legislator seeks reelection and wins
<i>Sought Higher Office</i>	1 if legislator seeks higher office (state senate, statewide office, or Congress, including appointed positions)
<i>Retired</i>	1 if legislator retired from politics

Appendix Table A.2: Summary Statistics				
Variable	Mean	St Dev	Min	Max
Effectiveness	61.0	34.4	1	120
Effectiveness 1	34.5	24.3	1	116
Power Committee Chair	.06	.24	0	1
Power Committee Vice Chair	.20	.40	0	1
Power Committee Leader	.24	.43	0	1
Number of Power Committees	1.55	.72	0	4
Other Committee Chair	.25	.44	0	1
Other Committee Vice Chair	.27	.44	0	1
Chamber Leader	.04	.20	0	1
Democrat	.67	.47	0	1
Majority Party	.68	.47	0	1
Lawyer	.18	.39	0	1
Previous Service	.09	.29	0	1
Age	54.0	12.2	24	90
Age at Entry	48.5	11.2	24	73
Tenure	3.67	2.78	1	19
Tenure 1	.23	.42	0	1
Tenure 2	.20	.40	0	1
Tenure 3	.16	.37	0	1
Tenure 4	.12	.32	0	1
Tenure 5+	.29	.45	0	1
Normal Vote, 1976-1980	.54	.06	.42	.75
Normal Vote, 1982-1990	.57	.09	.38	.78
Normal Vote, 1992-2000	.59	.09	.40	.83
Reelected	.89	.30	0	1
Uncontested	.39	.49	0	1
Sought Higher Office	.05	.22	0	1
Retired	.10	.30	0	1

Table 1: Determinants of Average Effectiveness, 1977-2002						
Dep. Var. = Effectiveness	FE All Reps.	RE All Reps.	FE Democs.	RE Democs.	FE Repubs.	RE Repubs.
Tenure 2	17.33** (1.32)	17.73** (1.24)	19.22** (1.75)	18.50** (1.63)	17.47** (2.35)	19.13** (2.22)
Tenure 3	25.50** (1.65)	25.83** (1.44)	25.79** (2.14)	24.68** (1.89)	26.02** (2.89)	28.14** (2.48)
Tenure 4	29.75** (1.95)	30.49** (1.60)	30.75** (2.41)	29.96** (2.02)	29.81** (3.66)	32.44** (2.99)
Tenure 5	33.03** (2.47)	34.42** (1.64)	35.01** (2.90)	34.06** (2.00)	31.06** (4.92)	36.86** (3.31)
Power Committee Chair	14.05** (1.86)	16.29** (1.82)	12.99** (2.05)	15.47** (2.00)	17.23** (4.05)	19.74** (4.03)
Power Committee Vice Chair	8.45** (1.16)	9.26** (1.12)	6.75** (1.27)	7.68** (1.23)	12.28** (2.63)	13.30** (2.58)
Other Committee Chair	8.11** (1.35)	8.32** (1.31)	7.29** (1.66)	8.22** (1.59)	7.08* (2.98)	6.52* (2.97)
Other Committee Vice Chair	2.50* (1.14)	1.98 (1.10)	2.09 (1.46)	2.27 (1.39)	.22 (2.25)	-1.21 (2.20)
Chamber Leader	12.74** (2.22)	16.06** (2.19)	11.09** (2.65)	12.29** (2.63)	19.58** (3.95)	22.63** (3.88)
Majority Party	21.06** (1.33)	20.88** (1.24)	---	---	---	---
Lawyer	---	20.09** (2.49)	---	18.79** (2.71)	---	19.36** (5.92)
Previous Service	---	7.61* (3.46)	---	18.73** (4.74)	---	.666 (5.32)
Age at Entry	---	-.454** (.086)	---	-.603** (.101)	---	-.273 (.158)
N	1,540	1,540	1,039	1,039	501	501
Hausman test statistic		354.7		164.7		81.3
P-value		.000		.000		.000

Standard errors in parentheses; ** = significant at the .01 level; * = significant at the .05 level.

All specifications include year fixed effects.

The excluded tenure category is *Tenure 1*, so the *Tenure* coefficients represent differences with respect to the valuation of freshmen.

The Hausman test statistics (columns 2, 4 and 6) are for hypothesis that the individual effects are orthogonal to the regressors.

Table 2: Determinants of Average Effectiveness NC Senate, 1977-2002		
Dep. Var. = Effectiveness	FE All Reprs.	RE All Reprs.
Tenure 2	8.36** (0.76)	7.58** (0.74)
Tenure 3	12.75** (0.95)	11.65** (0.86)
Tenure 4	15.09** (1.19)	13.59** (1.01)
Tenure 5	18.04** (1.59)	16.37** (1.10)
Power Committee Chair	5.36** (1.14)	7.68** (1.13)
Power Committee Vice Chair	2.39** (0.65)	3.08** (0.64)
Other Committee Chair	-0.17 (0.99)	1.98** (0.96)
Other Committee Vice Chair	-1.39 (0.82)	-0.49 (0.81)
Chamber Leader	1.56 (0.99)	2.63* (1.01)
Majority Party	—	—
Lawyer	—	7.32** (1.53)
Previous Service	—	3.06* (1.49)
Age at Entry	—	0.02 (0.07)
N	636	636

Standard errors in parentheses; ** = significant at the .01 level; * = significant at the .05 level.

All specifications include year fixed effects.

The excluded tenure category is *Tenure 1*, so the *Tenure* coefficients represent differences with respect to the valuation of freshmen.

Table 3: Survivor Analyses to Estimate Experience Effects, 1977-2002				
Dep. Var. = Effectiveness	FE All Reps.	RE All Reps.	FE Democrats	FE Republicans
Tenure 2	20.72** (4.02)	17.19** (1.83)	16.75** (5.25)	22.76** (6.86)
Tenure 3	31.86** (7.41)	24.88** (2.22)	22.84** (9.56)	35.98** (12.36)
Tenure 4	39.44** (10.78)	29.43** (2.54)	26.44** (13.85)	44.70** (18.05)
Power Committee Chair	13.10** (3.89)	16.41** (3.79)	10.56* (5.24)	10.80 (6.64)
Power Committee Vice Chair	8.89** (1.85)	10.44** (1.81)	8.18** (2.22)	8.13* (3.90)
Other Committee Chair	9.84** (2.07)	10.22** (2.04)	11.48** (2.71)	4.59 (4.45)
Other Committee Vice Chair	2.53 (1.68)	2.56 (1.66)	4.87* (2.30)	-1.71 (3.18)
Chamber Leader	19.12** (3.92)	20.62** (3.79)	11.06* (5.62)	26.54** (6.01)
Majority Party	21.36** (2.00)	21.38** (1.91)	—	—
Lawyer	—	18.75** (4.45)	—	—
Previous Service	—	5.74 (4.73)	—	—
Age at Entry	—	-.560** (0.15)	—	—
N	582	582	351	231
Hausman test statistic		72.25		
P-value		.000		

Standard errors in parentheses; ** = significant at the .01 level; * = significant at the .05 level.

Sample restricted to the first four terms of all legislators first elected between 1976 and 1994 who served four consecutive terms in the same chamber.

All specifications include year fixed effects.

The excluded tenure category is *Tenure 1*, so the *Tenure* coefficients represent differences with respect to the valuation of freshmen.

The *Tenure* coefficients are not significantly different between columns 3 and 4, so there is little evidence of differential experience effects across parties.

Dep. Variable = Effectiveness	Model and Sample			
Sample: Group tested:	1977-2001 Age at Entry <50	1977-1993 Democrats	1977-2001 Previous Service	1977-2001 Lawyers
Tenure 2 - Group	22.02** (4.28)	15.26** (5.69)	13.53* (6.02)	20.86** (5.51)
Tenure 2 - Non-Group	18.52** (4.38)	10.34 (6.45)	20.53** (4.01)	20.75** (4.06)
Tenure 3 - Group	32.16** (7.45)	25.04* (10.09)	20.2* (8.79)	26.73** (8.36)
Tenure 3 - Non-Group	29.24** (7.82)	20.22 (10.59)	31.09** (7.40)	32.83** (7.44)
Tenure 4 - Group	39.56** (10.85)	30.83* (14.45)	26.42* (12.02)	37.06** (11.33)
Tenure 4 - Non-Group	35.56** (11.18)	28.68 (15.03)	37.74** (10.75)	40.11** (10.82)
Power Committee Chair	12.66** (3.93)	15.13** (5.67)	12.98** (3.89)	14.14** (3.96)
Power Committee Vice Chair	8.72** (1.86)	10.79** (2.42)	8.41** (1.85)	9.02** (1.87)
Other Committee Chair	9.56** (2.08)	15.75** (3.09)	8.92** (2.09)	10.17** (2.10)
Other Committee Vice Chair	2.31 (1.69)	9.33** (2.47)	2.23 (1.68)	2.64 (1.69)
Chamber Leader	19.12** (3.93)	40.03** (5.56)	20.24** (3.93)	20.44** (4.01)
Majority Party	21.48** (2.00)	—	21.57** (2.00)	21.21** (2.03)
N	582	304	582	582
F test statistic	0.68	0.52	2.36	0.93
P-value	0.56	0.67	0.07	0.43

Standard errors in parentheses; ** = significant at the .01 level; * = significant at the .05 level.

All specifications include year fixed effects and individual fixed effects.

Sample restricted to the first four terms of all legislators elected between 1976 and 1994 who served four consecutive terms in the same chamber.

The excluded tenure category is *Tenure 1*, so the *Tenure* coefficients represent differences with respect to the valuation of freshmen.

The F test statistic is for the joint test of equality of the Tenure coefficients across groups.

Table 5: Advancement to Powerful Positions in the House, 1977-2002					
Dep. Var. = Power Committee Leader	Tenure=2	Tenure=3	Tenure=4	Tenure=3	Tenure=4
Effectiveness 1	.018** (.005)	.011* (.005)	.003 (.007)	—	—
Power Committee When Freshman	.327 (.192)	-.105 (.204)	.283 (.278)	—	—
Effectiveness Lagged	—	—	—	.012** (.004)	.011* (.005)
Committee Leader Lagged	—	—	—	.539 (.316)	1.25** (.309)
Majority Party	1.33** (.324)	1.34** (.292)	4.61** (.689)	4.43** (.757)	6.93** (.693)
Majority Party Lagged	—	—	—	-4.00** (.783)	-3.01** (.634)
Democrat	-.740* (.343)	-.531 (.301)	-2.88** (.736)	-.325 (.325)	-2.53** (.724)
N	270	199	146	227	176

Standard errors in parentheses; ** = significant at the .01 level; * = significant at the .05 level.

Year effects are included in all specifications.

All columns show probit regression coefficients.

Table 6: Ability vs. Seniority in the Advancement to Powerful Positions in the House, 1977-2002				
	Terms in Office			
Effectiveness 1	1	2	3	4
Low	.017 (.131) 173	.101 (.303) 118	.244 (.432) 90	.313 (.467) 67
High	.081 (.274) 172	.270 (.446) 137	.364 (.483) 99	.366 (.485) 71
t-statistic		3.57	1.78	.651
p-value		.00	.038	.258

Sample includes all legislators for which *Effectiveness 1* is observed. The first number in each cell gives the fraction of legislators in that category that hold a powerful position. The second number is the standard error, reported in parentheses. The third number is the frequency of that category.

The t-statistic is for a one-sided test of the hypothesis of no difference between legislators with High and Low values of *Effectiveness 1*.

Table 7: Effectiveness and Electoral Outcomes, 1978-2000					
Dep. Var. =	Reelected All Reps.	Reelected Freshmen	Unopposed All Reps.	Unopposed Freshmen	Votes MMDs
Effectiveness	.013** (.002)	.010* (.004)	.008** (.001)	.014** (.004)	16.51** (3.97)
Age	-.004 (.005)	-.011 (.008)	.003 (.004)	.001 (.008)	-7.51 (8.36)
Majority Party	-.521** (.147)	-.371 (.219)	.004 (.103)	-.126 (.196)	—
Power Committee Chair	-.109 (.316)	—	-.118 (.189)	—	-118.87 (400.78)
Power Committee Vice Chair	-.252 (.153)	-.002 (.498)	-.150 (.112)	-.429 (.474)	-148.22 (238.65)
Tenure	.012 (.027)	—	-.039 (.020)	—	56.95 (45.19)
Year	.027 (.019)	.003 (.034)	.002 (.015)	.001 (.033)	—
Normal Vote, 1976-1980	5.79** (.896)	5.83** (1.54)	5.98** (.567)	6.22** (1.43)	—
Normal Vote, 1982-1990	4.99** (.727)	4.38** (1.12)	7.04** (.542)	7.55** (1.11)	—
Normal Vote, 1992-2000	4.42** (.720)	4.59** (1.12)	6.70** (.531)	7.11** (1.05)	—
N	1,100	284	1,095	280	623

Standard errors in parentheses; ** = significant at the .01 level; * = significant at the .05 level. Sample is restricted to representatives seeking reelection to the NC House of Representatives.

Columns 1-4 show probit regression coefficients.

Column 5 is a linear regression, and includes year X district X party fixed effects.

Table 8: Effectiveness and Career Decisions, 1978-2000				
Dep. Var. =	Retired All Reps.	Retired Freshmen	Higher Office All Reps.	Higher Office Freshmen
Effectiveness	-.005* (.002)	-.015 (.009)	.006* (.003)	.002 (.007)
Age	-.006 (.005)	-.029* (.014)	-.019** (.007)	-.011 (.014)
Majority Party	-.116 (.146)	-.214 (.399)	-.309 (.192)	.198 (.389)
Power Committee Chair	.421 (.228)	—	.176 (.305)	—
Power Committee Vice Chair	.267 (.149)	1.22 (.663)	-.079 (.213)	.899 (.525)
Tenure	.098** (.023)	—	-.031 (.041)	—
Year	.054 (.023)	.119 (.083)	.042 (.029)	.033 (.093)
Normal Vote, 1976-1980	2.59* (.851)	6.23* (2.94)	-.189 (1.23)	—
Normal Vote, 1982-1990	.669 (.717)	1.98 (2.33)	-.695 (.974)	.331 (1.93)
Normal Vote, 1992-2000	-.358 (.753)	.746 (2.38)	-1.65 (1.01)	-.313 (1.82)
N	1,217	299	1,149	261

Standard errors in parentheses; **= significant at the .01 level; * = significant at the .05 level.

All columns show probit regression coefficients.

Higher Office denotes representatives who sought election for a higher office or accepted an appointment to a higher office.

Bibliography

- [1] ALDRICH, JOHN H. 1995. *Why Parties?* Chicago: University of Chicago Press.
- [2] ALDRICH, JOHN H., AND DAVID W. ROHDE. 2000. "The Consequences of Party Organization in the House: The Role of the Majority and Minority Parties in Conditional Party Government." In *Polarized Politics: Congress and the President in a Partisan Era*, Jon Bond and Richard Fleisher, editors. Washington, DC: CQ Press: 31-72.
- [3] ALDRICH, JOHN H. AND DAVID W. ROHDE. 2001. "The Logic of Conditional Party Government: Revisiting the Electoral Connection." In *Congress Reconsidered*, 7th edition, Lawrence C. Dodd and Bruce I. Oppenheimer, editors. Washington, DC: CQ Press: 269-292.
- [4] ANSOLABEHRE, STEPHEN, AND JAMES M. SNYDER, JR. 1999. "Money and Institutional Power." *TexasLawReview* 77: 1673-1704.
- [5] ANSOLABEHRE, STEPHEN, JAMES M. SNYDER, JR., AND CHARLES STEWART. 2000. "Old Voters, New Voters, and the Personal Vote: Using Redistricting to Measure the Incumbency Advantage." *American Journal of Political Science* 44: 17-34.
- [6] BANKS, JEFFREY S., AND RANGARAJAN K. SUNDARAM. 1993. "Adverse selections and moral hazard in a repeated elections model." In *Political Economy: Institutions, Information, Competition and Representation*, W. Barnett, M. Hinich and N. Schofield, editors. New York: Cambridge University Press.
- [7] BULLOCK, CHARLES S., III. 1972. "Freshman Committee Assignments and Re-election in the United States House of Representatives." *American Political Science Review* 66: 996-1007.

- [8] CONVERSE, PHILIP E. 1966. "The Concept of a Normal Vote." In *Elections and the Political Order*, Angus Campbell, Philip Converse, Warren Miller, and Donald Stokes, editors. New York: John Wiley and Sons.
- [9] COX, GARY W., AND ERIC MAGAR. 1999. "How Much is Majority Status in the U.S. Congress Worth?" *American Political Science Review* 93: 299-309.
- [10] COX, GARY W., AND MATHEW D. MCCUBBINS. 1993. *Legislative Leviathan*. Berkeley, CA: University of California Press.
- [11] COX, GARY W., AND MATHEW D. MCCUBBINS. 2002. "Agenda Power in the U.S. House of Representatives, 1877 to 1986." In *Party, Process, and Political Change in Congress: New Perspectives on the History of Congress* David W. Brady and Mathew D. McCubbins, editors. Stanford: Stanford University Press.
- [12] COX, GARY W., AND SCOTT MORGENSTERN. 1993. "The Increasing Advantage of Incumbency in the U.S. States." *Legislative Studies Quarterly* 18: 495-514.
- [13] COX, GARY W., AND SCOTT MORGENSTERN. 1995. "The Incumbency Advantage in Multimember Districts: Evidence from the U.S. States." *Legislative Studies Quarterly* 20: 329-349.
- [14] DEGREGORIO, CHRISTINE A. 1997. *Networks of Champions*. Ann Arbor, MI: University of Michigan Press.
- [15] FOWLER, LINDA L., SCOTT R. DOUGLASS, WESLEY D. CLARK, JR. 1980. "The Electoral Effects of House Committee Assignments." *Journal of Politics* 42: 307-319.
- [16] FRANCIS, WAYNE L. 1962. "Influence and Interaction in a State Legislative Body." *American Political Science Review* 56: 953-961.
- [17] GILMOUR, JOHN B., AND PAUL ROTHSTEIN. 1994. "Term Limitation in a Dynamic Model of Partisan Balance." *American Journal of Political Science* 38: 770-796.
- [18] HAMM, KEITH E., ROBERT HARMEL, AND ROBERT THOMPSON. 1983. "Ethnic and Partisan Minorities in Two Southern State Legislatures." *Legislative Studies Quarterly* 8: 177-189.

- [19] HAYNIE, KERRY L. 2002. "The Color of Their Skin or the Content of Their Behavior? Race and Perceptions of African American Legislators." *Legislative Studies Quarterly* 27: 295-314.
- [20] HIBBING, JOHN. 1991. *Congressional Careers: Contours of Life in the U.S. House of Representatives*. Chapel Hill, NC: University of North Carolina Press.
- [21] HOLBROOK, THOMAS M., AND CHARLES M. TIDMARCH. 1991. "Sophomore Surge in State Legislative Elections, 1968-1986." *Legislative Studies Quarterly* 16: 49-63.
- [22] KIEWIET, D. RODERICK, AND LANGCHE ZENG. 1993. "An Analysis of Congressional Career Decisions, 1947-1986." *American Political Science Review* 87: 928-941.
- [23] KING, GARY. 1991. "Constituency Service and Incumbency Advantage." *British Journal of Political Science* 21: 119-128.
- [24] KREHBIEL, KEITH. 1993. "Where's the Party?" *British Journal of Political Science* 23: 235-66.
- [25] KREHBIEL, KEITH. 1998. *Pivotal Politics: A Theory of U.S. Lawmaking*. Chicago: University of Chicago Press.
- [26] KREHBIEL, KEITH. 1999. "Paradoxes of Parties in Congress." *Legislative Studies Quarterly* 24: 31-64.
- [27] LUTTBEG, NORMAN R. 1992. "The Validity and Electoral Impact of Media Estimations of 'Best' and 'Worst' State Legislators." *Legislative Studies Quarterly* 17: 395-408.
- [28] MAYHEW, DAVID R. 2000. *America's Congress*. New Haven, CT: Yale University Press.
- [29] MCCURLEY, CARL, AND JEFFREY J. MONDAK. 1995. "Inspected by \#1184063113: The Influence of Incumbents' Competence and Integrity in U.S. House Elections." *American Journal of Political Science* 39: 864-885.
- [30] MEYER, KATHERINE. 1980 "Legislative Influence: Toward Theory Development through Causal Analysis." *Legislative Studies Quarterly* 5: 563-585.

- [31] MONDAK, JEFFREY J. 1995a. "Elections as Filters: Term Limits and the Composition of the US House." *Political Research Quarterly* 48: 701-727.
- [32] MONDAK, JEFFREY J. 1995b. "Focusing the Term Limits Debate." *Political Research Quarterly* 48: 741-750.
- [33] MONDAK, JEFFREY J. 1995c. "Competence, Integrity, and the Electoral Success of Congressional Incumbents." *Journal of Politics* 57: 1043-1069.
- [34] PERSSON TORSTEN, AND GUIDO TABELLINI 2000. *Political Economics: Explaining Economic Policy*. Cambridge: MIT Press.
- [35] PETRACCA, MARK P. 1995. "A Comment on Elections as Filters." *Political Research Quarterly* 48: 729-740.
- [36] ROHDE, DAVID W. 1991. *Parties and Leaders in the Postreform House*. Chicago: University of Chicago Press.
- [37] SCHILLER, WENDY J. 1995. "Senators as Political Entrepreneurs: Using Bill Sponsorship to Shape Legislative Agendas." *American Journal of Political Science* 39: 186-203.
- [38] SQUIRE, PEVERILL. 1992. "Legislative Professionalism and Membership Diversity in State Legislatures." *Legislative Studies Quarterly* 17:69-79.
- [39] SQUIRE, PEVERILL. 2000. "Uncontested Seats in State Legislative Elections." *Legislative Studies Quarterly* 25:131-146.
- [40] WAWRO, GREGORY. 2002. *Legislative Entrepreneurship in the U.S. House of Representatives*. Ann Arbor, MI: University of Michigan Press.
- [41] WEISSERT, CAROL S. 1991 "Issue Salience and State Legislative Effectiveness." *Legislative Studies Quarterly* 16: 509-520.