

Pernicious Foreign Aid?: A Political Economy of Political Institutions and the Effect of Foreign Aid

Alastair Smith

Wilf Family Department of Politics

New York University

726 Broadway, 7th floor

New York NY 10003-9580

May 16, 2006

Abstract

Incumbent political leaders risk being deposed by challengers within existing political rules and by revolutionary threats. I examine how the survival incentives created by these dual threats shape the effects of aid on government policy. I use Bueno de Mesquita et al's (2003) selectorate politics theory to examine the relationship between winning coalition size –the number of supporters a leader requires to retain office– and policy choice. In large winning coalition systems, the public goods focus of public policy means that foreign aid improves societal welfare and economic development.

In contrast, in small coalition systems the private rewards focus of policy induces a loyalty norm towards incumbents which enables leaders to skim off aid resources for themselves and their cronies. Further since in small coalition systems aid generates few of the societal benefits that it would under large coalition institutions, aid

increases the desire of citizens to rebel. Leaders can respond to such revolutionary threats by either buying off potential rebels by increasing the supply of public goods or retarding their ability to organize by suppressing public goods. Aid increases the relative attractiveness of the latter option because aid provides governments with "unearned" revenues that are relatively isolated from the economic decline induced by the suppression of public goods. The model also implies that aid can retard democratization.

INTRODUCTION

Political leaders face threats to their tenure in office from political rivals within the extant political structures and from challenges outside of these existing structures that seek to overhaul the whole institutional framework. Using Bueno de Mesquita et al's (2003) theory of selectorate politics as the basis for political competition, I examine how foreign aid affects which policy provisions best enable leaders to survive these internal and revolutionary threats. Outside of inclusive political institutions, such as democracy, the political incentives created by aid do little to encourage effective economic development and in some cases aid's effects are malignant—stifling the promotion of public goods, economic growth and democratization.

There are few topics more controversial than the contemporary debate on the role of foreign aid. Jeffrey Sachs (2005), and other proponents of projects such as the Millennium project (<http://www.unmillenniumproject.org/>), argue that the poor in developing countries can not afford to save and are thus trapped in a cycle of poverty. Such scholars argue that only through a massive increase in aid can this cycle be broken. In contrast, Bill Easterly (2006) argues that aid donors are relatively inept and that their planning mentality often does more harm than good.

Investment could help lift the poor out of poverty and aid agencies could greatly improve implementation. However, the fundamental problem with aid is the political incentives it creates in recipient nations. Outside of nations with inclusive political institutions, such as democracy, the nature of political competition means leaders better preserve their tenure in office by using aid to dispense private benefits to their cronies rather than provide public goods that create an economically productive environment conducive to growth. This makes aid an inefficient tool for development outside of large coalition political systems. Unfortunately, aid can be more than just inefficient. In some circumstances it creates malignant political incentives.

The malignant effects of aid are illustrated by the recent experiences in Chad. In 2000 the World Bank approved and helped finance a 665 mile oil pipeline project for landlocked Chad on the condition that the government passed a law that most of the resource rents be used to fight poverty. Between the completion of the \$4.2bn project in mid-2004 and early 2006 the project has generated revenues of \$399m. Unfortunately this has done little to improve life in Chad. The government increasingly faces armed rebellion and it has reneged on its commitment to fight poverty. Instead, it appears the revenues are being siphoned off by the government and used to buy the loyalty of the military (New York Times, February 18, 2006, Chad's Oil Riches, Meant for Poor, Are Diverted p. A8). Here I develop a theory that explains how political institutions and social conditions determine whether aid is malignant, benign or beneficial. In the process I also explain the effect of revolutionary threats and the resource curse on endogenous institutional change.

Although the theory is a general political economy model, I focus on the effects of aid on policy provision and economic activity. The logic of the arguments is not based on how a leader can best promote the economy, but rather which policies best enable a leader to survive given the institutional context in which she serves and any revolutionary threats she faces. In common with many political economy models, policy is made for the benefit of those who govern, not those who are governed (Acemoglu and Robinson 2001a; Coate and Morris 1999; Dixit, Grossman and Helpman 1997; Padro-i-Miquel 2004). Selectorate theory is relatively unknown to economists. Therefore, I provide an intuitive introduction to this model of political competition.

The selectorate model (Bueno de Mesquita et al 1999, 2002, 2003) classifies polities by the winning coalition (W)— the number of supporters whose support the incumbent needs to survive in office — and the selectorate (S) — the pool of potential supporters from which a leader can draw her coalition. Classifying institutions on these dimensions allows comparisons both within and across traditional regime typologies.

For instance, although winning coalitions in democracies are generally large they can differ substantially. In a two party system, a directly elected president requires the support of half the voters, while a parliamentary leader needs only half the votes in half the districts – one quarter of the voters – to retain power. Military juntas and elected monarchies have small selectorates, composed of military elites or aristocrats, and small winning coalitions. Dictatorships typically have small coalitions, although experience great variation in selectorate size.

Winning coalition size plays a central role in shaping policy provisions. Although a leader promotes an active economy through the provision of public goods, such policies are often inconsistent with political survival in small coalitions systems. In these systems leaders can more effectively ensure the loyalty of their small number of supporters through the provision of private goods. However, as coalition size increases private goods become an increasingly expensive means through which to reward supporters and leaders switch the focus of their policy provisions towards public goods.

Coalition size shapes the nature of policy provisions. Institutions also determine the ease with which leaders survive challenges within the extant political rules. When coalition size is small, and so public policy focuses on private goods, the incumbent's supporters are reluctant to defect because of the risk of exclusion from future coalitions. Once established in power, new leaders typically reorganize their coalition. This reorganization can leave the defectors that helped bring the challenger to office excluded from future access to private goods. When coalition size is small, these private goods are valuable. When coalition size is small and the selectorate is large, selectors have a relatively poor chance of being included in future coalitions. Therefore small coalition systems, particular those with large selectorates (such as rigged election autocracies), induce a loyalty norm which allows the incumbent to skim off discretionary resources for herself and still offer her supporters as much as potential

challengers credibly can. As we shall see, in such circumstances, aid intended to promote growth and alleviate poverty is often diverted into the pockets of the leader and her cronies.

A MODEL OF SELECTORATE POLITICS, REVOLUTION AND AID

Political Institutions and Policy Choice

A polity is composed on N citizens of which S , the selectorate, have an institutionalized say in who is leader. The incumbent leader, L , forms a coalition of W supporters chosen from the selectorate ($N \geq S$ and $W \leq S/2$). To survive in office she must maintain the support of this winning coalition. In each period of an infinitely repeated game the incumbent is matched against a political challenger, C , from within the extant political system and a revolutionary activist, A , who seeks revolutionary change. For technical convenience I assume infinite pools of challengers and activists.

In an attempt to gain their support, political leaders offer citizens a mix of (g) public and (z) private goods, subject to a budget constraint derived below.¹ There is an existing stock of public goods within society, G_0 . The overall level of public goods available within society depends upon both the extant stock and the flow of government provisions: $G = G_0 + g$. Public goods have three roles. First, they provide direct benefits to all member of society. Second, they enhance the returns on economic activities since they enable people to more productively deploy their labor. Third, public goods make it easier for citizens to organize and coordinate, thus making mass political movements, such as revolution, more likely to succeed.

¹It is worth drawing attention to this notation since Bueno de Mesquita et al's original work labels public goods as x and private goods as g .

Citizens' Economic Choices.—

Each citizen's utility depends upon four factors: the level of public goods (G), government provided private goods (z), income (y) and leisure (l). Let $V(G, z, y, l)$ be the citizens' utility function, which is additively separable and concave in each component: $V(G, z, y, l) = V^G(G) + V^z(z) + V^y(y) + V^l(l)$. In each period citizens allocate their unit of time between productive economic activities (λ) and leisure (l): $\lambda + l = 1$. The returns on economic effort depend upon the level of public goods within society, $f(G)$, where $f(G)$ is a continuous and increasing concave function. Healthy workers with access to communications and information can obtain higher returns from their efforts than can sickly, isolated and ignorant workers. Specifically, if a worker allocates λ proportion of her time to economic activities in a society with G public goods and a tax rate of r then her retained income is $y = (1 - r)\tau\lambda f(G)$, where τ is a technology parameter.

Citizens maximize their economic well-being by choosing an optimal effort level/leisure trade-off: $l^* = \arg \max V(G, z, y, l)$, where $y = \tau(1 - r)(1 - l)f(G)$. $l^*(G)$ defines the optimal leisure level given G public goods, which, assuming an interior solution, is given by the first order condition $-\tau(1 - r)f(G)V_y^y(\tau(1 - r)(1 - l)f(G)) + V_l^l(l) = 0$, where V_y^y and V_l^l correspond to partial derivatives of the components of the citizens' utility function associated with income and leisure. Public goods have both a direct and indirect effect on payoffs and productivity. Public goods improve productivity, which encourages citizens to work harder. Hence an improved supply of public goods improves the citizens' welfare directly, because they enjoy public goods, and indirectly because it improves their personal economic welfare.

Given the additive separability and concavity of the citizens' utility function, the citizens' payoff given optimal economic effort/leisure decision making can be written directly in terms of continuously increasing concave functions of G and z : specifically $V(G, z, \tau(1 - r)(1 - l^*(G))f(G), l^*(G)) = v(G) + u(z)$, normalized such that $u(0) = 0$.

Similarly, given the citizens' economic choices, each citizen's economic production is given by $\phi(G) = \tau(1 - l^*(G))f(G)$. Throughout the rest of this paper I utilize these induced utility and production functions.

Taxation of productive economic activities provides revenues for a government. However, this is not a government's only source of revenues. Foreign aid and natural resource rents provide governments with "unearned" or *free resources*. This is to say the citizens do not have to work for the government to obtain these revenues. Thus, unlike taxation, the government is not beholden to the economic consent of the citizens for these revenues (Olson 1993; McGuire and Olson 1996; Levi 1988). Although I use the term *free resources* to reflect that the citizens do not have to work for these revenues, the term is full of irony. Free resources often lead to the suppression of freedoms such as the rights of assembly, free press or freedom of speech that help coordinate mass political movements. Indeed, natural resources are often referred to as a curse (Gelb 1988; Humphreys 2005; Jensen and Wantchekon 2005; Ross 1999; Sachs and Warner 1995, 2001).

A government's total revenues are $R = R_0 + Nr\phi(G)$. The first term, R_0 , refers to the level of free resources, that is revenues that do not depend upon taxing economic activities. The second term, $Nr\phi(G)$, is taxation from the taxing N workers at a rate of r given that they each produce $\phi(G) = \tau(1 - l^*(G))f(G)$. The important distinction to note is that while governments receive the former income whether or not their policies encourage economic activity, the latter sources of income require the economic consent of the citizens.²

Government spending is subject to a budget constraint: $pg + Wz \leq R = R_0 + Nr\phi(G)$, where g and z represent the public and private goods provisions, p is the price of public goods and W , the size of the winning coalition, effectively acts as a price for private goods, as it describes the number of supporters who receive private

²The tax rate is assumed fixed. Bueno de Mesquita et al (2003) endogenize this choice.

goods.

Public goods affect the ease with which citizens can organize and coordinate. I model mass political movements as a proposal by an activist, A , to create a large coalition democratic system via revolution. In particular I assume the activist proposes revising political institutions such that $S = N$ and $W = N/2$, and announces a coalition of size $N/2$ and public and private policy provisions. If the citizens decide to support the revolution then it succeeds with probability $\rho(G)$. If the revolution is successful then the activist becomes the new leader under the revised institutional rules.

The ability of revolutionaries to organize is enhanced by the level of public goods. For instance, a citizen might wish to join an anti-government demonstration in a neighboring town, but if she does not know about the protest or has no means to get there, then it is impossible for her to participate. Public goods, such as the free flow of information and an effective transport network, make it easier to coordinate antigovernment activities (Bueno de Mesquita and Downs 2006). Scholars such as Granovetter (1978), Kuran (1989, 1991, 1995), Lohman (1994) and Oliver and Marwell (1985) treat anti-government protests and revolutions as tipping models. Citizens who are disenchanted with incumbent regimes readily join protests that already have high participation. Such large events are likely to be successful and their scale makes it unlikely that any individual will be picked out for punishment by the government. Yet to reach the tipping point where the vast majority of people are willing to join the protest, requires that the first few protesters or revolutionaries have confidence that there will be enough supporters for the movement to succeed; otherwise the revolutionaries are simply exposing themselves to government retribution. High levels of public goods within society increase the chances that revolutionaries can organize to gain enough momentum to reach the tipping point. Public goods are a double edged sword. While they promote economic activity, they also make it easier for citizens to

rebel.³

If a revolution occurs then all citizens pay a cost k . If the revolution succeeds, then the revolutionary activist becomes leader under democratic institutional arrangements. The citizens' continuation value associated with the game under post-revolutionary institutions is Q . For the purposes of generating examples I assume that Q is derived from the equilibrium outcome of the game with $W = N/2$. However, not all revolutions result in successful democratization (Acemoglu and Robinson 2006; Przeworski et al. 1997, 2000), While the activist's motives to democratize are sincere while he is a revolutionary, once he is leader he prefers a smaller coalition system (Bueno de Mesquita et al 2003 Chapt 8). This could be reflected by modeling coalition and selectorate size in post revolutionary institutions as a lottery and calculating Q accordingly. If the revolution fails, then the citizens pay an additional punishment cost ω associated with government retribution.

Political Competition.—

Incumbents face political threats from both challengers within the political system and activists who seek to revise the entire system. To guarantee their primary objective of political survival, leaders need to offer their supporters sufficient rewards that they do not defect to a political rival and ensure that the citizens do not rebel. Once this survival constraint is satisfied leaders want to maximize the amount of discretionary resources at their disposal. Specifically leaders want to maximize the difference between revenues, R , and the amount they need to spend on public and private goods: $M = pg + Wz$. Bueno de Mesquita et al (2003) use this difference as a metric for the ease of leader survival.

Following Bueno de Mesquita et al (2003, 2002), leaders have idiosyncratic affinities

³Robinson (1999) treats government investment in a similar manner to which I treat public goods. He argues this leads to under investment in predatory states.

over who they prefer to include in their coalition. In particular, I assume that once established in office, leaders form their coalition with those selectors with whom they have the highest affinity. To reflect that relatively less is known about political challengers than established incumbents, I assume that initially a politician's affinities are unknown. However, once a challenger attains office his affinities become revealed and he reorganizes his coalition around his highest affinity selectors. The revelation of affinities reflects the risks inherent for any supporter of defecting to a challenger. While a challenger needs the support of particular selectors to depose the incumbent, once established in office the new leader can, and typically does, realign his coalition. I assume that all possible affinity orderings over the selectors are equally likely. Under this assumption, the net effect of the revelation of affinities is that each selector has a W/S chance of being included in the challenger's long term coalition.

I now specify an infinitely repeated game. All players have a common discount factor δ . The subscripts L , C and A indicate the decisions associated with each politician.

1) Coalition Nomination and Policy Proposals⁴:

The incumbent leader forms a coalition from the W selectors highest in her affinity ordering. A challenger, C , and a revolutionary leader, A , are randomly drawn from an infinite pool of potential challengers. From the pool of selectors, the challenger, C , nominates a coalition of size W that includes at least one member of L 's coalition. The revolutionary agent, A , nominates a coalition of size $N/2$ that excludes members of L 's coalition. The incumbent, challenger and revolutionary activist each nominate provisions of public and private goods (g, z) subject to $g \geq 0$, $z \geq 0$ and the budget constraint, which is $pg + Wz \leq R_0 + Nr\phi(G_0 + g)$ for the incumbent and challenger and $pg + \frac{N}{2}z \leq R_0 + Nr\phi(G_0 + g)$ for the activist.

⁴Bueno de Mesquita et al (2002, 2003) examine optimal coalition choice. In light of their results, and for presentational simplicity, I specify coalition choice as part of the game form.

2) Revolution:

The $\frac{N}{2}$ citizens in A 's coalition decide whether to rebel. If they do so then the revolution is successful with probability $\rho(G_0 + g_L)$. If the revolution succeeds, then the activist becomes leader and institutional change occurs; otherwise the extant institutions persist.

3) Internal Political Competition:

If the incumbent survives the revolution in step 2 then the leader faces domestic competition within the extant institutions. The selectors choose between the incumbent and the challenger. If any selector within L 's coalition chooses the challenger, then the incumbent is deposed; otherwise L defeats C 's challenge.

4) Policy implementation and revelation of affinity:

The policy proposal of the selected leader is implemented and the affinity ordering of the leader, be she the original incumbent, the challenger, or the revolutionary activist, is revealed.

INTERNAL POLITICAL COMPETITION AND REVOLUTIONARY THREATS

I characterize a subgame perfect equilibrium in which the incumbent leader survives in every period by offering the policy provisions (g^*, z^*) to the coalition of her W highest affinity members of the selectorate. This characterization depends upon two constraints derived from internal political competition and revolutionary threats: $chal(g^*, z^*) = 0$ and $rebel(g^*, z^*) \geq 0$. Prior to stating the equilibrium conditions, I derive these constraints, and in the process of doing so, explain the logic of political competition. The results are illustrated using numerical examples in which $V(G, z, l, y) = \sqrt{G} + \sqrt{z} + \sqrt{l} + y$, $f(G) = \tau(1 - l)\sqrt{G}$, $\rho(G) = 1/(1 + \exp(\frac{-G - q_0}{\sigma}))$, $\tau = 1$, $N = 1000$, $S = N$, $p = 100$, $\delta = 1/2$, $q_0 = 12$, $\sigma = 4$, $k = 2$, $\omega = 2$ and $G_0 = 0$.

A political challenger (C) within the extant institutional setup seeks to become

leader by offering policy provisions that attract members of the incumbent's coalition to defect. Given the budget constraint, $pg + Wz \leq R_0 + Nr\phi(G_0 + g)$, and the need to form a coalition of size W , the highest reward that a challenger can offer potential defectors in the immediate period is given by policies (\hat{g}, \hat{z}) , where these policies solve the following programming problem:

$$(\hat{g}, \hat{z}) = \arg \max_{g, z} v(G_0 + g) + u(z) \text{ subject to } pg + Wz \leq R_0 + Nr\phi(G_0 + g) \quad (1)$$

In attempting to come to power a challenger can offer a potential supporter rewards worth $v(\hat{g} + G_0) + u(\hat{z})$. However, the challenger can not commit himself to future policy. Once established in power and having learned his affinity ordering over the selectors, in all future periods, the challenger survives in office by forming a coalition with his W highest affinity selectors and offering them policy provisions (g^*, z^*) . Since prior to revelation, all affinity orderings are equally likely, each selector has only a W/S chance of being included in the challenger's long term coalition should he become established as leader. Although the challenger can offer a potential defector $v(\hat{g} + G_0) + u(\hat{z})$ in the immediate period to defect, he can only offer access to future private goods (z^*) with probability W/S . With the complementary probability, $1 - \frac{W}{S}$, the selector is excluded from future coalitions and so receives no future rewards from private goods ($u(0) = 0$). The expected value of the best offer a challenger can credibly make is:

$$v(\hat{g} + G_0) + u(\hat{z}) + \frac{\delta}{1 - \delta} (v(g^* + G_0) + \frac{W}{S} u(z^*)) \quad (2)$$

The incumbent has an incumbency advantage over the challenger with respect to the provision of future private goods. Since the incumbent's affinities are known, she can offer future private goods to her coalition with certainty. Selectors contemplating a defection to the challenger know that, once established in office, the challenger is likely to reorganize his coalition which potentially excludes them from the coalition

in the future.

To maintain the support of her coalition against the threat of internal competition, the incumbent needs to ensure that she provides her supporters with rewards worth at least those of the challenger's best possible offer (eqn 2). Specifically, $v(g^* + G_0) + u(z^*) + \frac{\delta}{1-\delta}(v(g^* + G_0) + u(z^*)) \geq v(\hat{g} + G_0) + u(\hat{z}) + \frac{\delta}{1-\delta}(v(g^* + G_0) + \frac{W}{S}u(z^*))$. Although the challenger might offer potential supporters more today, $v(\hat{g} + G_0) + u(\hat{z}) > v(g^* + G_0) + u(z^*)$, the incumbent offers greater expected private goods in the future, $\frac{\delta}{1-\delta}u(z^*) > \frac{1}{1-\delta}\frac{W}{S}u(z^*)$. Satisfying this condition yields the following constraint:

$$chal(g^*, z^*) = v(g^* + G_0) + u(z^*) - v(\hat{g} + G_0) - u(\hat{z}) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z^*) = 0 \quad (3)$$

Leaders also face revolutionary threats. The revolutionary activist, A , proposes a coalition of $N/2$ citizens (outside of L 's coalition) and policy provisions (g_A, z_A) . The best possible offer that the activist can offer his $\frac{N}{2}$ supporters in the immediate period is $v(\tilde{g}) + u(\tilde{z})$, where $(\tilde{g}, \tilde{z}) = \arg \max_{g,z} v(G_0 + g) + u(z)$ subject to the budget constraint $pg + \frac{N}{2}z \leq R_0 + Nr\phi(G_0 + g)$.

Should the revolution succeed, the citizens receive an expected payoff of Q associated with the continuation value of politics under the new institutional arrangements. Although not all revolutions end up creating stable democracy (Acemoglu and Robinson 2006), for the purpose of constructing examples in this paper I assume that, following a successful revolution, institutions change to $W = N/2$ and $S = N$. Under these new institutional rules, there is a SPE in which the activist becomes the new leader and survives in every subsequent period with the policy provisions (g_r^*, z_r^*) . Since upon the revelation of the activist's affinities each citizen has $1/2$ chance of being included in the activist's long term coalition, $Q = \frac{1}{1-\delta}(v(G_0 + g_r^*) + \frac{1}{2}u(z_r^*))$.

If the citizens in A 's coalition rebel, then they succeed with probability $\rho(G_0 + g_L)$ and their payoff from a successful revolution is $-k + v(G_0 + g_A) + u(z_A) + \delta Q$, where

k is the cost of rebelling, $v(G_0 + g_A) + u(z_A)$ reflects the value of the activist's policies in the current period and δQ is the discounted continuation value associated with political rewards after the revolution. If the revolution fails, then the rebels' payoff is $-k - \omega + v(G_0 + g^*) + \frac{\delta}{1-\delta}v(G_0 + g^*)$, where ω is the additional punishment cost from a failed revolution. The expected value of the activist's best possible offer (evaluated at the incumbent's equilibrium policies, $g_L = g^*$) is $(-k - \omega + \frac{1}{1-\delta}v(G_0 + g^*)) + \rho(G_0 + g^*)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - \frac{1}{1-\delta}v(G_0 + g^*))$. Absent a revolution, the citizens outside of the winning coalition receive a payoff of $v(G_0 + g^*) + \frac{\delta}{1-\delta}v(G_0 + g^*)$. Provided that this is at least as large as the expected value for rebelling, the incumbent prevents revolutions. This need to forestall revolutions produces the following constraint:

$$rebel(g^*, z^*) = -k - \omega + \rho(G_0 + g^*)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - \frac{1}{1-\delta}v(G_0 + g^*)) \geq 0 \quad (4)$$

To guarantee her survival in office, the incumbent needs to satisfy both $chal(g^*, z^*)$ and $rebel(g^*, z^*)$ constraints. These constraints $chal(g^*, z^*)$ and $rebel(g^*, z^*)$ allow us to succinctly characterize equilibria in which incumbent leaders always survive. I restrict attention to stationary strategies, those in which players play the same way in every structurally identical setting. This restriction rules out strategies which condition on the time period or the previous history of play for instance. Subject to surviving in office, the incumbent wants to maximize discretionary resources $R_0 + Nr\phi(G_0 + g) - pg - Wz$, that is, the difference between revenues and expenditures.

Proposition: In a stationary subgame perfect equilibrium in which the incumbent always survives, the incumbent's policies, (g^*, z^*) , solve the following programming problem: $(g^*, z^*) \in \arg \max_{(g,z)} R_0 + Nr\phi(G_0 + g) - pg - Wz$ subject to $chal(g^*, z^*) = 0$ and $rebel(g^*, z^*) \geq 0$ and non-negativity constraints.

The proof of this claim follows straightforwardly from the arguments developed above. The constrained maximization problem can be solved in the standard way by

forming a Lagrangian equation and solving for first and second order conditions, as discussed in the appendix. It is important to note that the problem is not globally concave when the *rebel* constraint binds, a result that has important substantive implications.

Another important aspect of the characterization is that the constraint $chal(g^*, z^*) = 0$ is always binding.⁵ The maximization problem can be divided into two discrete cases. In the first, only the constraint $chal(g^*, z^*) = 0$ binds, and in the second both constraints bind.

Case 1. $(g^*, z^*) \in \arg \max_{g,z} R_0 + Nr\phi(G_0 + g^*) - pg^* - Wz^*$ subject to $chal(g^*, z^*) = 0$

Case 2. $(g^*, x^*) \in \arg \max_{g,z} R_0 + Nr\phi(G_0 + g^*) - pg^* - Wz^*$ subject to $chal(g^*, z^*) = 0$ and $rebel(g^*, z^*) = 0$.

The appendix examines the first order conditions and characterizes each of these cases. Here I focus on the substantive implications.

POLICY AND SURVIVAL IMPLICATIONS OF POLITICAL COMPETITION ABSENT A REVOLUTIONARY THREAT

Political institutions shape the nature of public policy and the prospects of political survival. Absent a revolutionary threat, winning coalition size determines the relative mix of public and private goods. When coalition size is small, leaders can greatly reward their few essential supporters by supplying private goods. However, as coalition size becomes large, private goods become more thinly spread and leaders can more efficiently reward their supporters through the provision of public goods. The larger the winning coalition becomes the greater the leader's focus on public,

⁵To see why, suppose this is not the case. If $chal(g^*, z^*) > 0$ then there exists an alternative policy profile (g^*, z') that differs from (g^*, z^*) only in that $z' < z^*$ such that $chal(g^*, z^*) > chal(g^*, z') \geq 0$ and $rebel(g^*, z^*) = rebel(g^*, z')$ which improves the incumbent's payoff per period payoff by $(g^* - g')W$.

rather than private, goods (Baum and Lake 2001).

Institutions also affect the ease of political survival, which are conceptualized as the difference between revenues and what a leaders needs to spends to survive ($R_0 + Nr\phi(G_0 + g^*) - pg^* - Wz^*$). This measure of discretionary resources characterizes the amount of slack in the budget and therefore the amount of extra resources leaders have to compensate supporters for any errors or shocks. Political institutions affect the magnitude of a leader's discretionary resources, and, by extension, her ease of survival.

When supporters of the incumbent contemplate defecting to a challenger they jeopardize their access to future private goods. Once the challenger attains office he reorganizes his coalition. If a defector is replaced, then he loses access to private goods in the future. The importance of private goods as a reward mechanism and the risk of exclusion shape the loyalty of supporters to the incumbent. In large coalition systems, private goods are relatively unimportant and the probability of exclusion from future coalitions is relative low. Since neither the cost nor the risk of exclusion is high in large coalition systems, members of the incumbent's coalition have little loyalty towards the incumbent, who, as a result, can skim off few discretionary resources. In contrast, when coalition size is small, the focus on private goods provision makes the cost and risk of exclusion high. This induces a norm of loyalty and enables the leader to skim of discretionary resources for herself and still match the best possible offer of a challenger.

I now turn to the central question and ask under what institutional settings does aid most effectively promote economic activity and societal welfare? Societal welfare is defined as the expected payoff for a randomly chosen citizen, which equals $v(G_0 + g^*) + \frac{W}{S}u(z^*)$. In large coalition systems, leaders capture relatively few resources and policy provisions are predominately public goods in nature. As such, an increase in aid receipts translates into an increased supply of public goods, which in turn

increases both economic productivity and societal welfare. The success of Marshall aid given to the relatively democratic nations of Western Europe following World War II appears consistent with these predictions.

Burnside and Dollar (2000) find the effective use of aid accompanies "good" policies. The quality of government policies figures highly in analyses explaining the relative development successes of East Asia and failures of Africa (Aoki et al. 1997; Campos and Root 1995; Rodrik 1995, 1996, 1998; Sachs and Warner 1997). It is relatively large coalition systems that create the political incentives for good policy.

Foreign aid has been much less successful in terms of alleviating poverty and suffering and promoting growth in small coalition systems. In such systems leaders survive through the distribution of private goods. Therefore, increases in free resources, such as aid or natural resource rents, have comparatively fewer positive impacts on economic activity and societal welfare because the majority of the additional resources are either captured by the leader, as discretionary resources, or doled out as private goods to supporters rather than used to fund public goods provisions.

Absent a revolutionary threat, aid has positive effects on the supply of public goods and the promotion of economic activity. However, the extent of these positive effects depends upon institutions. Aid promotes greater improvements in societal welfare and economic productivity in large coalition systems than in small coalition systems. Unfortunately, the effects of aid are not always beneficial or benign. Foreign aid and other forms of free resources increase revolutionary threats, which often result in policy responses which are harmful to both the economy and citizens' welfare.

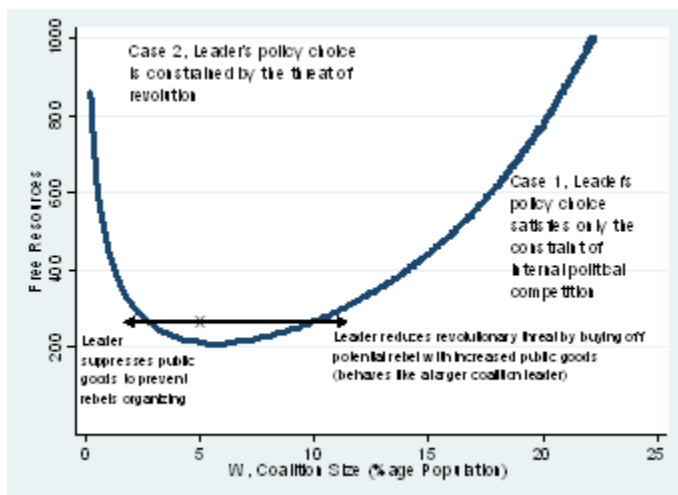
POLICY CHOICE AND SURVIVAL IN LIGHT OF REVOLUTIONARY THREATS

The Occurrence of Revolutionary Threats

Large coalition systems are relatively more efficient than small coalitions at converting free resources, such as aid, into societal benefits and economic activity because the free resources fund public goods rather than the corruption, graft and kleptocracy of private benefits for the coalition and discretionary resources for the leader. From the perspective of citizens outside of the winning coalition, if the level of aid rises, then the desirability of a large coalition relative to a small coalition increases. This encourages the citizens to support revolution and so shifts the analysis of the policies that best enhance leader survival in office from case 1 to case 2.

Figure 1 graphically demonstrates, in terms of coalition size and free resources, the conditions under which revolutionary threats constrain a leader's policy choices. The lower region corresponds to case 1. In this region leaders pick policies to maximize their discretionary resources while matching the best possible offer from a challenger within the extant political rules. In contrast, in the upper region, if leaders follow the policy prescriptions of internal competition alone, then the citizens would rebel. In this region, leaders must also be mindful of revolutionary threats when formulating policy, case 2.

Figure 1: The Presence of Revolutionary Threats in Terms of Free Resources and Coalition Size.



Free resources increase revolutionary threats as they increase the desirability of revolutionary change, as demonstrated empirically by Collier and Hoeffler (1998; see also Ron 2005). Coalition size also influences whether revolutionary threats affect a leader’s policy choices. However, the effects of coalition size on the presence of revolutionary threats is non-monotonic. In the example illustrated in figure 1 the citizens are more likely to rebel when the coalition size is about 6% of the population than if the coalition is either larger or smaller.

The citizens’ decision to rebel is affected by two factors: the difference between their welfare under the current institutions relative to the welfare they expect under post-revolutionary institutions and the probability of the revolution succeeding. Coalition size and the stock of pre-existing public goods, G_0 , affect each of these factors in different ways. When coalition size is small leaders provide few public goods. This leaves the citizens extremely dissatisfied with their lot relative to what they hope they could obtain under post-revolutionary institutions. This gives them a great desire to rebel. However, the citizens also factor the probability of success into their decision to rebel. When the coalition is small, leaders provide few of the public goods which help revolutionaries coordinate and organize. As a result, when W is small, citizens choose not to rebel; not because they don’t want change, but because they are unlikely to

succeed.

In large coalition systems, citizens are also unlikely to rebel. However, they have for different reasons. Leaders in large coalition systems provide many public goods. This makes it relatively easy for revolutionaries to coordinate and organize. However, precisely because the leaders are already providing the high levels of public goods which the citizens expect to obtain under post-revolutionary institutions, the citizens have relatively little desire to rebel.

The citizens' decision to rebel depends upon both the desire for revolutionary change and the ability to effect such a transformation. Growth in the level of free resources, such as aid or natural resource rents, increases the desire for change. High extant stocks of public goods, G_0 , increase the ability of citizens to rebel. Coalition size has a non-monotonic effect on revolutionary threats. An increase in coalition size results in policy provisions which make it easier for citizens to rebel but which simultaneously reduce their desire for change. Acemoglu and Robinson (2002) find a similar non-monotonicity result in their model of government willingness to accept economic innovations. I expect revolutionary threats to be relatively unlikely in either very small or very large coalition systems. However, precisely which configuration of political institutions makes revolution most likely depends upon parameterization and is therefore an empirical question.

Policy Responses to Revolutionary Threats

If leaders face revolutionary threats, then they must adjust their policy to ameliorate this threat or risk deposition via revolution. The case 1 characterization of equilibria described the policies that most effectively allowed leaders to resist threats from political rivals within the extant institutions. Unfortunately for the leader, sometimes these policies, which are optimal for internal political competition, induce the citizens to rebel. Figure 1, for example, showed where revolutionary threats form

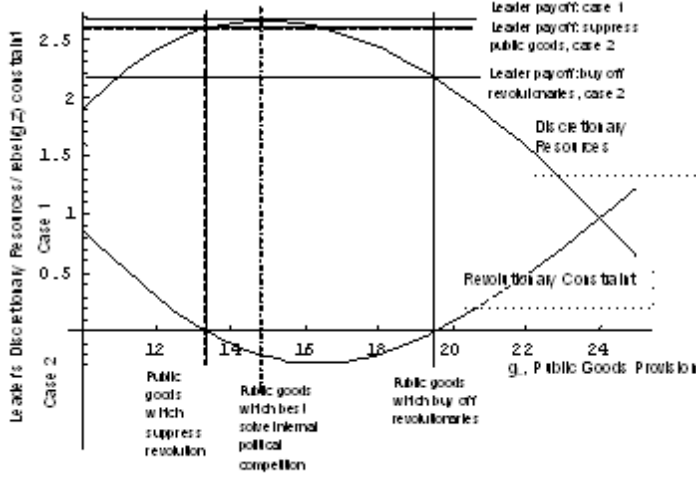
binding constraints on a leader's policy choice. I now examine how leaders adjust policy in the face of a revolutionary threat.

The provision of public goods plays a central role in creating revolutionary threats. The citizens desire revolution when the supply of public goods is low relative to the level citizens expect to receive under post-revolutionary institution. Citizens can effectively rebel when the level of public goods enables revolutionaries to coordinate and organize a revolution. Leaders can suppress revolutionary urges by either improving the supply of public goods, such that the citizens no longer desire revolution, or by suppressing the supply of public goods such that, even though the citizens become more desirous of change, they can not effect it. The intuition for this result can be seen by looking at the case of coalition size equal to 5% of the population and $R_0 = 250$ (which corresponds to about 12% of the total economy), marked as "X" in figure 1. Since this case is in the upper area of figure 1, the leader faces a revolutionary threat. However, if the leader shifted her public goods provisions to those commensurate with either a smaller or larger coalition system (that is move to either the left or the right in figure 1), then the revolutionary threat would dissipate. I examine this case in further detail.

Figure 2 examines the incentives of the citizens to rebel and the incumbent leader's welfare as a function of the leader's provision of public goods, g_L . The "U" shaped curve is the constraint $rebel(g, z) = -k - \omega + \rho(G_0 + g)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - \frac{1}{1-\delta}v(G_0 + g))$ as a function of public goods g . The "inverted U" shaped function is the incumbent's level of discretionary resources $(R_0 + Nr\phi(G_0 + g) - pg - Wz)$, scaled by dividing by 100 so it fits on a similar scale, as a function of public goods provision. This level of discretionary resources is calculated by assuming that, for each value of g , the leader provides just enough private goods to satisfy internal political competition (i.e. $chal(g, z) = v(g + G_0) + u(z) - v(\hat{g} + G_0) - u(\hat{z}) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z) = 0$).

Figure 2: Revolutionary Threats, Discretionary Resources and the Provision of

Public Goods.



The central vertical line in figure 2, at $g = 14.9$, represents the policy provision that maximizes the incumbent's discretionary resources while satisfying the constraints of internal political competition. Unfortunately, at this level of public goods the citizens would rebel, as demonstrated by the function $rebel(g, z)$ being negative. To forestall the revolution the leader needs to either make it harder for the citizens to succeed by suppressing the provision of public goods or increase the provision of public goods such that the citizens, although more likely to succeed, becomes less desirous of change. In this example, the leader needs to either suppress public goods provisions below $g = 13.3$ or increase them beyond $g = 19.5$. Although either of these solutions will dispel the revolutionary threat, the leader prefers the former to the latter solution as it enables her to retain greater discretionary resources.

Leaders can dissipate revolutionary threats via either the suppression or the promotion of public goods. Political institutions, the level of free resources and the extant level of public goods affect which of these options the leader prefers. If a leader provides fewer public goods, then she must compensate her supporters with additional private goods. Her supporters need additional private benefits for two reasons. First, her supporters need to be compensated for the reduction in the direct

benefits derived from public goods. Second the reduction of public goods reduces the returns on economic activity. The incumbent's supporters also need to be reimbursed for these losses. This need to compensate supporters with additional private goods makes the suppression of public goods particularly undesirable when the coalition size is relatively large, as a large number of supporters need additional private goods.

Another consequence of suppressing public goods is to reduce productive economic activities. As the returns to effort decline, the citizens do less work and tax revenues fall. Having to increase private compensations for the coalition during such a budget contraction makes public goods suppression relatively unattractive. Zimbabwe's President Robert Mugabe's destruction of urban housing and local markets and the forced dispersion of urban populations to isolated rural areas has helped insulate him from revolutionary threats.⁶ Unfortunately, it has also damaged the economy and Zimbabwe, once Africa's second largest food exporter, faces starvation and bankruptcy.

High levels of free resources ameliorate the negative revenue consequences of public goods suppression. When a large proportion of government income is derived from aid or natural resources, the proportionate effect of public goods suppression on government revenues is smaller, which makes such an approach to dealing with revolutionary threats more attractive from the leader's perspective. In this context, foreign aid can be divisive. It simultaneously increases revolutionary threats and makes public goods suppression the more attractive response.

The initial stock of public goods within society also affects the relative desirability of suppressing public goods. When society already has a high stock of public goods, particularly those goods such as high literacy rates which take a long time to change but are important in facilitating coordination, then attempts to suppress the organizational ability of revolutionaries diminish the probability of revolutionary success

⁶http://news.bbc.co.uk/1/hi/world/africa/country_profiles/1831470.stm

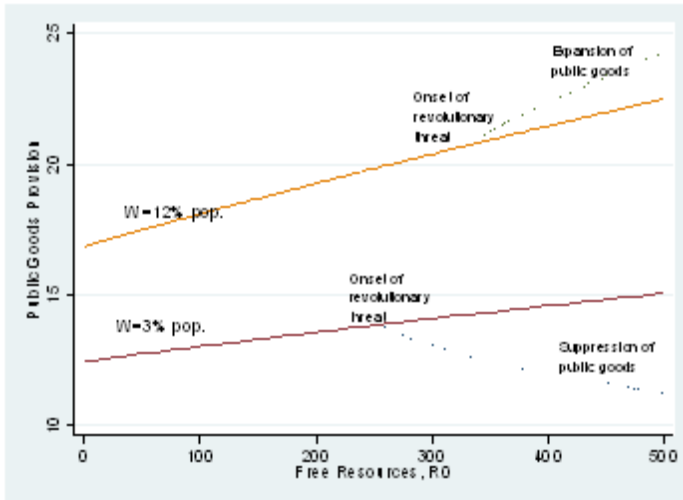
relatively little.

Leaders in relatively small coalition systems with high levels of free resources and low initial stocks of public goods are most likely to promote their personal welfare and political survival by responding to revolutionary threats with the suppression of public goods. In contrast, leaders with relatively large coalitions, low levels of free resources and high initial stocks of public goods are likely to expand the supply of public goods in response to revolutionary threats.

THE INSTITUTIONALLY DETERMINED IMPACT OF AID

Aid provides governments with unearned income and allows the leader to obtain revenues without the economic consent of the citizens. The consequences of foreign aid, the discovery of readily exploitable natural resources, or any other form of free resources depends upon the institutional context. Figure 3 provides a pictorial summary of some of the main findings. The graph plots the provision of public goods for a relatively large ($W = 120$, upper lines) and relatively small ($W = 30$, lower lines) winning coalition systems against the level of aid or other free resource. Since economic activity and societal welfare are increasing in public goods provisions, graphs of these variables exhibit similar patterns.

Figure 3: Public Goods Provisions, Free Resources and Coalition Size.



These graphs illustrate three important relationships between aid and political institutions. First, leaders in large coalition systems provide higher levels of public goods than leaders in small coalitions. Second, leaders in large coalition systems convert more of the aid they receive into public goods than leaders in small coalitions. Thus foreign aid promotes economic activity and societal welfare to a greater extent in large rather than small coalition systems. Third, when an increase in aid creates revolutionary threats, leaders in large coalitions are likely to respond by increasing the supply of public goods while small coalition leaders are more likely to contract this supply.

The first two effects can be seen by comparing the provision of public goods at low levels of aid, and hence absent a revolutionary threat. The larger coalition system provides both more public goods and converts increases in aid into public goods at a faster rate than the small coalition system. That is, both the intercept and slope of the graphs are larger for the large W case. As the level of aid increases, leaders in both the relatively large and small coalition systems experience the onset of a revolutionary threat. The onset of this threat occurs at different levels of aid depending upon the size of the coalition, as illustrated in figure 1. The solid line illustrates the policy leaders provide absent the revolutionary threat (that is the case 1 optimal policies).

Coalition size affects the leader's responses to revolutionary threats. In the relatively large coalition system, once the revolutionary threat binds the leader further increases the supply of public goods; this is shown by the dotted curve kinking upwards. In the smaller coalition system, the onset of the revolutionary threat leads to the suppression of public goods, shown by the dotted curve kinking downwards.

IMPLICATIONS AND EXTENSIONS

Political institutions, sources of government revenue and stocks of societal public goods create the survival incentives for leaders. These political, economic and social factors shape the nature of governments' policy provisions. To date I have made no distinction between different public goods. Indeed the formal model considers a single public good. In reality governments provide many different public goods which differ in their effects on economic productivity and the ability of revolutionaries to organize. For instance, public health promotes economic productivity since healthy people work more effectively than sickly workers, but its direct role in coordinating revolutionary activities is less obvious. In contrast, government transparency and freedom of information contribute to both economic productivity and revolutionary success. Bueno de Mesquita and Downs (2005) distinguish between these types of policies as standard public goods and coordination goods. The logic of the model suggests political institutions and the level of free resources influence not just the level of public goods which leaders supply, but also the mix of these goods.

Standard public goods provide rewards for supporters, promote economic activity and provide benefits to the citizens, but they do not facilitate the coordination of revolutionary activities. However coordination goods do. Leader in very large coalition systems face few revolutionary threats since the citizens already have the policy provisions they could hope to obtain through revolution. Such leaders choose the mix of goods that best provides rewards and promotes the economy. In smaller coalitions

tion systems the citizens desire institutional change. The nature of internal political competition encourages low overall levels of public goods, and the desire to minimize revolutionary threats causes leaders to prefer a mix of public goods with relatively few coordination goods.

The willingness of small coalition leaders to supply standard public goods but not coordination goods suggests aid programs designed to enhance standard public goods provisions, such as vaccinations and other public health programs, are more likely to be successful than programs that promote freedom of information, government transparency or coordination skills. While the later types of programs might be beneficial to the economy and public welfare, they endanger the incumbent's hold on power because they boost the prospects of revolutionary success. Rather than allow aid programs to improve the societal level of coordination goods, leaders better enhance their survival prospects by looting the resources of these programs for their enrichment and that of their supporters. Perhaps one of the most ironic illustrations of this was the IMF and World Bank's 2003 decision to re-establish lending and aid to Kenya, which had been previously suspended over corruption concerns. President Mwai Kibaki obtained the aid, in large part, to fund his anti-corruption reform programs. However, his government appears as corrupt as its predecessor with estimates that \$1bn went missing over three years and polls indicating that Kenyans think conditions have deteriorated.⁷

Political institutions determine which policy provisions best enable leaders to survive the dual challenges of internal political competition and revolutionary threats. Large coalition systems focus political competition on the efficient provision of public goods. In such systems leaders need to assign the majority of aid receipts and natural

⁷BBC.news.co.uk: "Kenya's anti-graft czar resigns" (7 February, 2005); IMF unfreezes key funds for Kenya (22 November, 2003); US cuts Kenya anti-corruption aid (8 February, 2005); Poll blow for Kenya's new rulers (31 December, 2004).

resource rents to the provision of public goods if they want to match the best offers of political rivals. Leaders capture relatively few of the resources for themselves. Aid provisions in large coalition systems promote the provision of public goods and its attendant improvements in economic activity. In contrast, the private goods focus of small coalition systems means that increases in aid or natural resource rents does more to improve leader survival and access to discretionary resources than it does to enhance development.

Institutional Change and Endogenous Democratization

I have not modeled the dynamic process that lead to the current institutional and social setting. Yet, the model offers insight into the dynamics of how current government choices affect future policy making. If, for instance, a leader provides more education to promote economic growth, then in the future the literate citizens will find it easier to coordinate mass political actions. In the model's terms, this is to say, that increasing the present flow of public goods (g_L) leads to an increased stock of public goods, G_0 , in the future. This has implications for future policy making. Once a leader embarks on such a course, the improvement in the ability of potential revolutionaries to organize means that, in the future, leaders will face revolutionary threats and find it increasingly difficult to suppress public goods.⁸ As the conditions under which leaders provide policy change, so the desires and abilities of different actors to alter the rules of the game through institutional reforms also change. The theory considers only a single, revolutionary, mechanism for institutional change. Yet the theory offers a powerful lens through which to consider other forms of institutional change by characterizing the institutional preferences of different groups in society.

⁸Greif and Laitin (2005), in their model of endogenous institutional change, consider how pseudo-parameters of the game change over time in response to past play in a manner akin to that described.

Absent a revolutionary threat, leaders want institutional changes that reduce coalition size. In contrast, those outside the winning coalition prefer increases in the inclusiveness of political institutions because of the public goods focus it induces. The preferences of the winning coalition are non-monotonic and determined by two competing influences. First, an expansion of coalition size leads to a dilution of the private goods coalition members receive. Second, the weakened loyalty induced by an expansion of the winning coalition forces the leader to reduce her discretionary resources and to spend more on the coalition. When the coalition size is small the former effect dominates and coalition members have incentives to resist an expansion of the coalition. However, beyond a certain size, coalition members' preferences over institutional design switch from aligning with those of the leader to aligning with those of the citizens. These characterizations of preferences over institutions suggests the nature of changes in political institutions depends upon who gets to make decisions (Bueno de Mesquita et al 2003).

With respect to internal political competition, the different elements of society never agree upon the direction of institutional change. Yet the presence of a revolutionary threat can produce concordance of institutional preferences. If leaders respond to revolutionary threats by increasing the provision of public goods (which is the likely response when R_0 is low and G_0 is high) then it becomes increasingly difficult for leaders to reverse this course of action because the high provision of public goods leads to the gradual accumulation in the ability of the citizens to demand yet more public goods. Such trends lead to contradictory policy demands. The internal politics of small coalition systems require the incumbent to buy the loyalty of her coalition with private goods, yet revolutionary threats mean she must also provide relatively high levels of public goods. Effectively this leaves the leader with two different groups that need to be bought off with different types of goods. Democratization helps resolve these policy contradictions since increases in coalition size shift the pol-

icy focus of the winning coalition closer to the policy goals of those outside of the coalition.

Revolutionary threats effectively cause leaders to mimic either smaller or larger coalition systems with respect to public goods provisions, as seen in figures 1 and 2. As the stock of societal public goods grows and so the citizens can force the leader to mimic ever larger coalition systems, the simultaneous demands for private goods induced by internal political competition and public goods to buy off potential revolutionaries reduce the leader's discretionary resources below the level of discretionary resources that the leader could obtain in the large coalition system that she is mimicking. This is to say that while the leader can always better satisfy the *chal* constraint in a small coalition system, if the leader must satisfy both *chal* and *rebel* constraints then she might be worse off than satisfying the single constraint *chal* in a larger coalition setting. At this point all societal actors support democratization. Foreign aid helps inhibit any such transition to democracy because it reduces the incentives for leaders to embark on the path of public goods liberalization by making public goods suppression relatively more attractive.⁹

This analysis of preferences over institutional design contributes to the literature on democratization. Much of the recent debate has centered around the findings of Przeworski et al. (1997, 2000). They show that although both rich and poor nations transition to democracy, only poor democracies become non-democratic again. Above an income level of \$6000 per capita no democratic system became non-democratic. More controversially Przeworski argues the probability of transitioning to democracy is independent of wealth. This latter claim has been challenged, by for example Boix and Stokes (2003; Boix 2003). Consistent with earlier modernization theories (Lipset 1959; Moore 1966), they argue wealth increases the rate of democratization. The

⁹Acemoglu, Johnson and Robinson (2001) show that extractive economic activities lead to the development of poor political institutions.

analysis suggests that it is not income that drives institutional change but whether this wealth is derived from free resources, such as foreign aid or natural resource rents that inhibit democratization, or the accumulation of societal public goods which enhance both productive economic activity and the citizens' ability to oppose the government.¹⁰

Policy Implications

This paper ties together aspects of a nation's political institutions, economic performance and social structure. Although the underlying model is general, the primary focus here has been on the impact of foreign aid. Foreign aid can be very successful at helping alleviate poverty and increasing economic activity, but only in those institutional settings that need the least help.

Aid either promotes or retards political and economic development depending upon conditions. Unfortunately, the abysmal record of foreign aid at alleviating poverty (Easterly 2006) suggests that the majority of aid receiving nations fall within the region where the effects of aid are malignant. In small coalition systems, the threats to a leader's survival from internal political competition are sufficiently weak that leaders manage to capture many aid resources for themselves, and those resources that they need to dispense as rewards to their coalition are predominately private in nature. Leaders in small coalition systems convert aid into kleptocracy and graft rather than into the alleviation of poverty. What is more, leaders with buoyant aid receipts do not need the economic consent of the citizens to maintain the supply of government resources. Given the weakness of internal political constraints in small coalition systems, this need to maintain economic activity can play a major role in containing the capriciousness of the government. Foreign aid weakens a leader's

¹⁰Acemoglu and Robinson (2001; 2006) argue institutional stability and the method of transition between different institutions depend upon income inequality.

need to provide public goods in order to raise revenues, increases the citizens' desire for revolutionary change and increases the likelihood that a leader responds to any revolutionary threat through the suppression of public goods.

These arguments call into question the humanitarian benefit of foreign aid, although not necessarily the other purposes for aid, such as buying favors. Given the failure of foreign aid to alleviate poverty over the post war period in all but a limited number of cases, arguments that "something must be done" appear mistaken. The theory presented here suggests that aid might have been more important in enhancing the survival of corrupt regimes than it was at encouraging leaders to pursue policies that enhance economic activity and societal welfare.

Institutional reforms that create large coalition systems provide the most effective means to promote development. In such systems leaders enhance their political survival by providing those policies that encourage economic activity. Unfortunately, rather than aiding democratization, foreign aid potentially stifles the incentives to liberalize. While it might be tempting to offer aid in return for subsequent political reforms, any expectations that such reforms will be carried out are unrealistic. Aid reduces the political incentives to reform. If leaders were unwilling to democratize prior to aid being given, then they will certainly not be willing to democratize afterwards.

APPENDIX

In the text I derived two constraints, $chal(g, z)$ and $rebel(g, z)$, equations 3 and 4. If the incumbent's policies do not satisfy the first constraint then her supporters would defect to a political rival. If her policies do not satisfy the second constraint, then the citizens rebel. Here I elaborate of the proposition and examine the FOC that characterize policies on the equilibrium path. I start by examining the policies of challengers and incumbents absent a revolutionary threat.

Case 1: The challenger maximizing the value of his offer implies the following

Lagrangian $L = v(G_0 + g_c) + u(z_c) + \kappa(pg_c + Wz_c - R_0 - Nr\phi(G_0 + g_c))$ which yields FOC $L_{z_c} = u_z(z_c) + \kappa W = 0$, $L_\kappa = pg_c + Wz_c - R_0 - Nr\phi(G_0 + g_c) = 0$ and $L_{g_c} = v_g(G_0 + g_c) + \kappa(p - Nr\phi_g(G_0 + g_c)) = 0$. These conditions imply the challenger's policy (\hat{g}, \hat{z}) solve the following 2 identities $E1 = pg_c + Wz_c - R_0 - Nr\phi(G_0 + g_c) = 0$ and $E2 = v_g(G_0 + g_c) - \frac{u_z(z_c)}{W}(p - Nr\phi_g(G_0 + g_c)) = 0$.

The incumbent's desire to maximize discretionary resources and match the challenger's offer, $v(G_0 + g_L) + u(z_L) + \frac{\delta}{1-\delta}[v(G_0 + g^*) + u(z^*)] \geq v(\hat{g} + G_0) + u(\hat{z}) + \frac{\delta}{1-\delta}[v(G^*) + \frac{W}{S}u(z^*)]$, implies the Lagrangian $L = R_0 + Nr\phi(G_0 + g_L) - p(G_0 + g_L) - Wz_L + \theta[v(g_L + G_0) + u(z_L) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z^*) - v(G_0 + \hat{g}) - u(\hat{z})]$. The FOC are $L_\theta = v(g_L + G_0) + u(z_L) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z^*) - v(G_0 + \hat{g}) - u(\hat{z}) = 0$, $L_{z_L} = -W + \theta u_z(z_L) = 0$ and $L_{g_L} = Nr\phi_g(G_0 + g_L) - p + \theta v_g(G_0 + g_L) = 0$.

These FOC conditions and stationarity (i.e. that $g_L = g^*$ and $z_L = z^*$) imply $E3 = v(G_0 + g^*) + \frac{1}{1-\delta}(1 - \frac{\delta W}{S})u(z_L) - v(G_0 + \hat{g}) - u(z_c) = 0$, and $E4 = Nr\phi_g(G_0 + g^*) - p + \frac{W}{u_z(z_L)}v_g(G_0 + g^*) = 0$. Equations $E1$ through $E4$ characterize policies in case 1.

Case 2: Leaders must deal with both internal and revolutionary threats to their tenure. As in case 1, optimal offers by the challenger implies equations $E1$ and $E2$ characterize (\hat{g}, \hat{z}) .

Next I characterize the optimal offer of the activist in the immediate period. This is an identical maximization to that for challenger, except that it is evaluated at $W = N/2$. Therefore this yields that the revolutionary's policy (\tilde{g}, \tilde{z}) satisfies $F1 = pg_A + \frac{N}{2}z_A - R_0 - Nr\phi(G_0 + g_A) = 0$ and $F2 = v_g(G_0 + g_A) - \frac{2u_z(z_A)}{N}(p - Nr\phi_g(G_0 + g_A)) = 0$.

The citizens' continuation value associated with post-revolutionary institutions is Q . For the purpose of constructing examples I assumed $Q = \frac{1}{(1-\delta)}(v(G_0 + g_r^*) + \frac{1}{2}u(z_r^*))$ where (g_r^*, z_r^*) solve equations $E1$ through $E4$ with W evaluated at $W = N/2$. This assumes that after the activist secures revolutionary success his affinities are revealed such that each citizen has a 1/2 chance of being in the incumbents long term coalition.

The policies (g_r^*, z_r^*) best solve the problem of internal competition (as described in case 1) under these new institutional rules.

The incumbents programming problem is $\max R_0 + Nr\phi(G_0 + g_L) - pg_L - Wz_L$ subject to $v(g_L + G_0) + u(z_L) - v(\hat{g} + G_0) - u(\hat{z}) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z^*) = 0$ and $(-k - \omega) + \rho(G_0 + g_L)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - v(G_0 + g_L) - \frac{\delta}{1-\delta}v(G_0 + g^*)) \geq 0$.

Forming a Lagrangian produces $L = R_0 + Nr\phi(G_0 + g_L) - pg_L - Wz_L + \theta[v(g_L + G_0) + u(z_L) - v(\hat{g} + G_0) - u(\hat{z}) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z^*)] + \kappa[(-k - \omega) + \rho(G_0 + g_L)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - v(G_0 + g_L) - \frac{\delta}{1-\delta}v(G_0 + g^*))]$ with FOC $L_\theta = v(g_L + G_0) + u(z_L) - v(\hat{g} + G_0) - u(\hat{z}) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z^*) = 0$, $L_\kappa = (-k - \omega) + \rho(G_0 + g_L)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - v(G_0 + g_L) - \frac{\delta}{1-\delta}v(G_0 + g^*)) = 0$, $L_{g_L} = Nr\phi_g(G_0 + g_L) - p + \theta[v_g(g_L + G_0)] + \kappa[\rho_g(G_0 + g_L)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - v(G_0 + g_L) - \frac{\delta}{1-\delta}v(G_0 + g^*)) + \rho(G_0 + g_L)(-v_g(G_0 + g_L))] = 0$ and $L_{z_L} = -W + \theta u_z(z_L) = 0$. Note that the conditions L_{g_L} and L_{z_L} are slack.

These FOC and stationarity (ie $g_L = g^*$ and $z_L = z^*$) implies the following identities: $H1 = v(g^* + G_0) + u(z_L) - v(\hat{g} + G_0) - u(\hat{z}) + \frac{\delta}{1-\delta}(1 - \frac{W}{S})u(z^*) = 0$ and $H2 = (-k - \omega) + \rho(G_0 + g^*)(\omega + v(G_0 + \tilde{g}) + u(\tilde{z}) + \delta Q - v(G_0 + g^*) - \frac{\delta}{1-\delta}v(G_0 + g^*)) = 0$.

Thus in case 2 the policy provisions of the challenger, activist and incumbent solve equations E1 and E2, F1 and F2 and H1 and H2. The continuation value associated with post revolutionary institutions, Q , is by evaluating case 1 at $W = N/2$.

REFERENCES

Acemoglu, Daron and James A. Robinson. 2001. "Inefficient Redistribution." *American Political Science Review* 95(3, Sept.): 649-661.

Acemoglu, Daron and James A. Robinson. 2006. *Economic Origins of Dictatorship and Democracy*. New York: Cambridge University Press.

Acemoglu, Daron, Simon Johnson and James A Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Eco-*

nomic Review 91(5, Dec.): 1369-1401.

Aoki, Masahiko, Hyung-Ki Kim and Masahiro Okuno-Fujiwara (1997) *The Role of Government in East Asian Economic Development*. Oxford University Press, Oxford UK.

Boix, Carles, Susan C Stokes. 2003. "Endogenous Democratization." *World Politics* 55(4, July): 517-549.

Boix, Carles. 2003. *Democracy and Redistribution*. New York: Cambridge University Press.

Bueno de Mesquita, Bruce., James D. Morrow, Randolph M. Siverson and Alastair Smith. 1999. "An Institutional Explanation of the Democratic Peace" *American Political Science Review*. December 93(4):791-808.

Bueno de Mesquita, Bruce , James Morrow, Randolph Siverson and Alastair Smith. 2002. "Political Institutions, Policy Choice and the Survival of Leaders." *British Journal of Political Science*. Volume 32 Issue 04 October 2002 p.559-590.

Bueno de Mesquita, Bruce, Alastair Smith, Randolph Siverson and James Morrow. 2003. *The Logic of Political Survival*. Cambridge, MA: MIT Press.

Bueno de Mesquita, Bruce and George Downs. 2006. Strategic Coordination, Public Goods, and Political Survival. Working Paper, Dept. of Politics, New York University.

Burnside, Craig and David Dollar. 2000. Aid, Policies and Growth. *American Economic Review* 90 (4): 847-68.

Campos, J.Edgar and Hilton L. Root (1996) *The Key to the East Asian Miracle: Making Shared Growth Credible*, Brookings Institution, Washington DC.

Coate, Stephen T., and Stephen E. Morris 1999. "Policy persistence." *American Economic Review* 89(December): 1327-36.

Collier, Paul and Anke Hoeffler 1998. "On Economic Causes of Civil War." *Oxford Economic Papers* 50(4):563-73.

Dixit, Avinash K., Gene E. Grossman and Elhanan L. Helpman. 1997. "Common Agency and Coordination: General Theory and Application to Government Policy Making." *Journal of Political Economy* 105(August): 752-69.

Easterly, William. 2006. *The White Man's Burden: Why the West's efforts to aid the Rest have done so much ill and so little good*. New York: Penguin Press.

Gelb, A.H. 1988. *Windfall Gains: Blessing or Curse?*. New York: Oxford University Press.

Granovetter, Mark. 1978. "Threshold models of collective behavior." *American Journal of Sociology*. 83: 1420-43.

Greif, Avner and David D. Laitin. 2004. "A Theory of Endogenous Institutional Change." *American Political Science Review*, 98(4 November): 633-652.

Humphreys, Macartan. 2005. "Natural Resources, Conflict, and Conflict Resolution: Uncovering the Mechanisms." *Journal of Conflict Resolution* 49(4, Aug.):508-537.

Jensen, Nathan and Leonard Wantchekon. 2005. "Resource Wealth and Political Regimes in Africa." *Comparative Political Studies*, Forthcoming.

Kuran, Timur. 1989. "Sparks and Prairie Fires: A theory of unanticipated political revolution." *Public Choice* 61: 41-74.

Kuran, Timur. 1991. "Now out of never: The element of surprise in the East European revolution of 1989." *World Politics* 44:7-48.

Kuran, Timur. 1995. *Private truths, public lies: The social consequences of preference falsification*. Cambridge, MA: Harvard University Press.

Lake, David A. and Matthew A. Baum. 2001. "The Invisible Hand of Democracy: Political Control and the Provision of Public Services." *Comparative Political Studies* 34(6): 587-621.

Lipset, Seymour M. 1959. Some Social Prerequisites for Democracy: Economic Development and Political Legitimacy. *American Political Science Review* 53: 69-

105.

Levi, Margaret (1988) *Of Rule and Revenue*, University of California at Berkeley Press, Berkeley, CA.

Lohman, Suzanne. 1994. "The dynamics of informational cascades: The Monday demonstrations in Leipzig, East Germany, 1989-91." *World Politics* 47: 42-101.

McGuire, Martin C. and Mancur C. Olson. 1996. "The Economics of Autocracy and Majority Rule," *Journal of Economic Literature*, 34, 72-96.

Moore, Barrington. 1966. *The Social Origins of Dictatorship and Democracy: Lord and Peasant in the Making of the Modern World*. Boston: Beacon Press.

Oliver, Pamela and Gerald Marwell. 1985. "A theory of the critical mass: Interdependence, group heterogeneity, and the production of collective action." *American Journal of Sociology* 94: 502-34.

Olson, Mancur C. 1993. "Dictatorship, Democracy and Development," *American Political Science Review*, 87(3), p 567-576.

Padro-i-Miquel, Gerard. 2004. "Political Accountability in Divided Societies: The Politics of Fear." Dept. of Economics, MIT.

Przeworski, Adam, and Fernando Limongi. 1997. "Modernization: Theories and Facts." *World Politics* 49(2, January): 155-183.

Przeworski, Adam, Michael E. Alvarez, Jose Antonio Cheibub, and Fernando Limongi. 2000. *Democracy and Development*. New York: Cambridge University Press.

Robinson, James A. 1999. "When Is a State Predatory?" University of California, Berkeley.

Rodrik, Dani (1995) "Getting Interventions Right: How South Korea and Taiwan Grew Rich," *Economic Policy*, 20, 55-107.

Rodrik, Dani (1996) "Understanding Economic Policy Reform," *Journal of Economic Literature*, 34: 9-41.

Rodrik, Dani (1998) "The New Global Economy and Developing Countries: Making Openness Work." ODC Economic Development Policy Essay No. 24, Washington DC.

Ron, James (ed). 2005. "Paradigm in Distress? Primary Commodities and Civil War." Special edition of the *Journal of Conflict Resolution*. 49(4, August): 443-633.

Ross, Michael. 1999. "Political Economy of Resource Curse". *World Politics* 51: 297-322.

Sachs, Jeffrey D. 2005. *The End of Poverty: Economic Possibilities for our Time*. New York: The Penguin Press.

Sachs, Jeffrey D. and Andrew M. Warner. 1995. "Natural Resource Abundance and Economic Growth." NBER, working paper series, working paper 5398. National Bureau of Economic Research, Cambridge MA.

Sachs, Jeffrey D. and Andrew M. Warner. 1997. "Sources of Slow Growth in African Economies," *Journal of African Economics*, 6: 335-376.

Sachs, Jeffrey D. and Andrew M. Warner. 2001. "The Curse of Natural Resources" *European Economic Review* 45: 827-838.