The Political Economy of Direct Dividend Transfers in Resource-Rich Countries

A Theoretical Consideration

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Abstract

The acceleration of natural resource discoveries across many parts of the developing world has highlighted the urgent need for solutions to the mismanagement of windfalls that has blighted many countries over the past half-century. One proposal involves distributing annually a share of resource rents to citizens in the form of direct dividend transfers. Although many scholars and policy makers have discussed the potential economic and political ramifications of the proposal from a normative perspective, few have analyzed positively the conditions under which such a policy may emerge as a politically rational choice. This policy research paper fills that gap by modeling the decision of political leaders to allocate resource revenues between cash transfers, public goods, power-preserving activities, and personal consumption. The analysis finds first that propitious political conditions, including competitive elections, undeveloped patronage networks, and a high degree of budgetary accountability, increase the share of resource revenues to be spent on citizens' welfare. The paper then shows that a high poverty headcount and inefficient public institutions will each strengthen the political incentive to provide direct dividend transfers relative to public goods. This combination of conditions is rare, which may explain why relatively few countries have implemented or plan to implement direct dividend transfers.

The Political Economy of Direct Dividend Transfers in Resource-Rich Countries: A Theoretical Consideration

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1. Introduction

The recent acceleration of natural resource discoveries in some of the world's poorest countries ought to engender real prospects for sustainable growth and development. By right, Mozambicans should expect newly discovered gas reserves (estimated to be worth around $400 billion in revenue over the next four decades) to create a genuine opportunity for shared prosperity in one of the most impoverished countries in the world, just as Ghanaians, Ugandans and Tanzanians should harbor hope over recent oil and gas discoveries.

In reality, however, these opportunities are frequently squandered in countries that lack well-governed public institutions. Building on Sachs and Warner (1995, 2001), cross-country observations by Mehlum et al. (2006) show that, in a sample of countries with weak initial governance, economic growth is negatively associated with resource-abundance.

Initial explanations for this relationship centered largely on economic channels, wherein resource windfalls undermine the competitiveness of the non-resource sector through currency appreciation and the misallocation of productive assets (van Wijnbergen 1984; Krugman 1987; Corden and Neary 1982; Torvik 2002). Of late, however, theoretical and empirical analyses have highlighted the primacy of political mechanisms underlining the resource "curse". Robinson et al. (2006) submit that, in the absence of strong political constraints, resource boons lead to dysfunctional political behavior by raising the value of being in power and providing leaders with the means to influence election outcomes. Ross (2001) presents empirical evidence to support the claim that natural resource abundance – characterized in this instance as oil exports – impedes democracy, a finding later supported by Tsui (2011), McGuirk (2013) and Jensen and Wantchekon (2004). Vicente (2010) and Brollo et al. (2013) find respectively that oil discoveries and other exogenous government windfalls increase corruption, while Dube and Vargas (2013), Ross (2006) and Collier and Hoeffler (2004) find evidence that natural resources can increase the likelihood of civil conflict.

While recent contributions to the literature challenge certain aspects of the resource curse story – most notably from Brunnschweiler and Bulte (2008), Alexeev and Conrad (2009) and Haber and Menaldo (2011) – a broad consensus remains that, at the very least, countries with poor institutions have failed to convert natural assets into sustained human development in an optimal manner (see Collier 2010; van der Ploeg 2011; Ross 2012; and Ross, forthcoming). This is reflected in resource-rich countries like Gabon, which has one of the lowest child immunization rates in the world, despite producing per capita output of over $10,000; in Nigeria, which saw its poverty headcount remaining stubbornly high in the time it accumulated over $350 billion in oil revenues; and in Equatorial Guinea, where the child mortality rate is 100 per thousand, despite having per capita output over 30 times larger than Liberia, where child mortality is 75 per thousand.

If countries are to avoid the pitfalls of previous episodes by translating windfalls into sustained poverty reduction and robust growth, it is imperative to consider innovative strategies. Indeed, as Collier (2010) notes, because Africa is relatively underexplored, the value of its known sub-soil natural assets is five times lower per squared kilometer than in OECD member-states, suggesting that significant resource discoveries are likely to continue in the near future. This enhances further the importance of new policies to improve resource governance.

One proposal under consideration involves governments of resource-rich countries transferring directly a percentage of annual steady-state resource rents to citizens in the form of Direct Dividend Transfers (DDTs). The policy, advocated to various degrees by Moss (2011), Sala-i-Martin and Subramanian (2003), Collier et al. (2009), Gillies (2010), Devarajan and Giugale (2012), and Devarajan et al (2011), is purported to overcome several resource curse pitfalls through (i) its direct effects on poverty reduction and (ii) by establishing a fiscal contract between citizens and their government, both by creating a broad-based constituency with a vested interest in how point resources are managed by politicians, and, potentially, by taxing back some of the dividend. These effects are posited in turn to improve public accountability and the efficiency of public spending through more vigorous citizen oversight.

Gillies (2010) notwithstanding, most of the policy discussion thus far has focused on normative assessments of the proposal; in other words, scholars and policy makers have debated extensively the potential benefits and costs of the policy, without explicitly considering the conditions under which self-interested leaders of resource-rich African countries may deem direct transfers to be a rational political strategy.

The aim of this paper is to address that gap without adopting a normative position on the potential effects of DDTs. Which leaders are likely to adopt such a radical measure? Under what conditions are DDTs a politically feasible option? How can external policy makers identify a suitable political environment in which to advocate the policy? Why has it been implemented in Alaska and Alberta, but not in Africa? We explore these questions with the aid of a simple conceptual framework that captures the political incentives facing self-interested leaders in the context of electoral competition.

We find first that governments will allocate a higher share of resource revenues to causes that enhance citizens' welfare where elections are competitive, budgetary checks and balances are in place, information on resource deposits is transparent, patronage networks are undeveloped, and resource discoveries are both relatively recent and relatively valuable. Among these countries, governments will be more likely to adopt DDTs than to invest in public goods where the poverty headcount is high and where public institutions are inefficient. This combination of political development and economic underdevelopment is rare. Our argument thus provides one explanation for why so few countries have implemented or plan to implement a DDT program.

In the next section we summarize the normative aspects of the proposal. In Section 3 we introduce the foundation of our positive analysis. In Section 4 we relax certain assumptions and explore some relevant extensions, while we discuss the implications of our analysis and finally conclude in Section 5.

2. Direct Dividend Transfers: The Normative Assessment

In this section, we provide a brief summary of the rationale for Direct Dividend Transfers, taking into account also the associated risks of the policy as well as its relative standing compared to alternative policy options. In short, governments face four options for allocating resource revenues: (a) distribution to private citizens through DDTs, subsidies or tax relief; (b) public spending though either government consumption (public sector wage or employment increases) or investment in public assets; (c) retaining domestic financial assets through either government lending to the private sector or reducing existing public debt; and (d) retaining foreign financial assets through the accumulation of foreign financial reserves or through a sovereign wealth fund (Collier et al., 2009). We discuss the relative implications of the DDT option under two headings below: governance and economics.

2.1 Governance

Much of the anticipated benefit of DDTs for governance in resource-rich countries is predicated on the assumption of *rentier* behavior in their absence. Rentier behavior emerges when leaders are emancipated by external resource rents from the obligation of taxing their citizenry to fund personal consumption or public goods. This disconnect represents a fracture of the 'fiscal contract' – the notion that, once taxed, citizens exert greater scrutiny on the management of public revenues, enforcing leaders to spend public revenues efficiently and fairly in order to elicit further tax revenue from citizens. When leaders are in receipt of large, external rents, the burden of taxation can be alleviated from citizens, who will then demand less accountability, eventually resulting in dysfunctional political behavior. McGuirk (2013) provides empirical evidence for this cycle in the context of resource-rich African states, while Paler (forthcoming) and Martin (2013) provide experimental evidence on the link between taxation and scrutiny.

Direct Dividend Transfers are presumed to curtail rentier behavior in two ways. First, by allocating a publicized share of resource income to citizens, governments also transfer informational content on the size of resource revenues. This may induce more scrutiny

from citizens by reducing the uncertainty of their returns to monitoring (Devarajan et al., 2011). While this channel remains a possibility, it is difficult to rule out a countervailing mechanism, wherein dividends serve to acquiesce citizens and consequently reduce their oversight of government spending. Ultimately, the validity of this channel remains an empirical issue.

The second channel through which DDTs could improve governance is if a portion is subsequently taxed back by the government in order to fund public expenditure. This represents an explicit construction of the fiscal contract, and is more likely to result in keen citizen oversight of revenue management. Indeed, Devarajan et al. (2011) and Devarajan and Giugale (2012) even discuss the possibility that this mechanism could result in more public goods than the equivalent expenditure on direct public investments, as increased scrutiny may improve efficiency throughout the chain from public outlays to the end-point delivery of public goods. Conversely, direct expenditure on public investments would remain prone to leakage, a feature common in many institutionally weak African states (Reinikka and Svensson 2004).[1]

Of the four broad options discussed above, only a combination of direct dividends and subsequent taxation is likely to mitigate rentier behavior, as no other option makes explicit demands of citizens to contribute to public revenues. Moreover, accountability mechanisms aside, there is good reason to believe that the DDT option may be the least exposed to political rent extraction, in part due to relative directness of the distribution channel. As Sandbu and Humphreys (2007) note, sovereign funds are prone to premature embezzlement unless accompanied by rigorous regulations. Government lending in poorly governed countries is also subject to corruption, (Khwaja and Mian 2005). To illustrate the case for DDTs, Moss (2011) observes that, in Ghana, Public Expenditure Tracking Surveys (PETS) found that between 50% and 80% of public spending was leaked through the system; by comparison, one million fraudulent recipients of direct transfers would represent the equivalent of only a 4% leakage. In addition, these

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[1] Reinikka and Svensson (2004) famously found that 87% of capitation grants for primary schools in Uganda did not reach the intended end-users.

fraudulent recipients may be more likely to spend domestically than the beneficiaries of mass public spending leakage.[2]

While certainly not immune to mismanagement (as argued by Gillies 2010) or subject to institutional failure, the governance case for DDTs with subsequent taxation appears relatively compelling from a normative perspective.

2.2   Economics

In their comparison of spending options for resource-rich, capital-scarce countries (such as those under consideration in this paper), Collier et al. (2009) make an economic case for a DDT component in the optimal spending portfolio. First, they note, traditional prescriptions to save the windfall in foreign financial assets based on the Permanent Income Hypothesis (PIH) are less compelling in the context of a capital-scare country with prospects for high future income growth. In these instances, it is optimal to allocate more resources for current consumption and domestic investment than PIH models would otherwise prescribe. In poorer countries with a high share of the population below the income poverty line and low capital stock, the returns to private consumption by the poor and investment are relatively high. Second, in countries with weak institutions, it may be optimal to delegate both the allocation of capital and the execution of investments to private citizens. Poorly governed countries often lack the technical capacity to choose high-return investments and the institutional capacity to implement them efficiently.[3]

Moss (2011) and Devarajan and Giugale (2012) also point to the strong potential of direct transfers to reduce poverty and promote pro-poor growth. Direct transfers will have a disproportionately large effect on the utility of poorer citizens, owing to diminishing marginal returns of consumption. Moreover, direct transfers will benefit all citizens, unlike many public investment projects where a bias in allocation often tends to benefit mainly those in urban areas. Finally, reliable and regular transfers will also protect poor

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[2] That is: one million DDTs misdirected out of a total of 25 million.
[3] Sala-i-Martin and Subramanian (2003) present an alarming account of revenue wastage in resource-rich Nigeria.

citizens from income volatility, reducing the likelihood of asset stripping or acute deprivation in the event of economic shocks.

This economic case for cash transfers has strong empirical support from the literature. The proliferation of conditional cash transfer (CCT) programs across Latin America and elsewhere has been accompanied by a culture of rigorous evaluation methods, resulting in robust evidence for their benign effects on child heath, educational attainment and several other development outcomes (see Gertler 2004 for an early evaluation of Mexico's PROGRESA program on child health outcomes, and Fiszbein et al. 2009 for a broader, policy-oriented research review of CCTs). Conditional Cash Transfer programs now exist in over 45 countries, and are widely held to be one of the more successful anti-poverty strategies to emerge in recent times.[4]

Of more interest to the proposal at hand, however, is the mounting evidence that 'cash' component in CCTs alone may have significant and sustainable implications for development. Evidence from Fernald et al. (2008), Baird et al. (2011) and, most recently, Blattman et al. (2013) and Haushofer and Shapiro (2013) points to significantly benign effects of unconditional cash transfers on child health, educational attainment, asset ownership, consumption, food security, poverty, psychological wellbeing (including the stress hormone cortisol), and even structural change, confirming the proposition of Collier et al. (2009) that, once relieved of tight credit constraints, private citizens allocate resources productively. Moreover, Haushofer and Shapiro found no evidence that unconditional transfers in Kenya were spent on temptation goods such as tobacco, alcohol or gambling.

In sum, there seems to be a strong rationale to explore further the potential of DDTs in resource-rich countries with respect to both economic and governance outcomes. In the next section, we analyze the conditions necessary for the proposal to become a rational policy option for political leaders in developing countries.

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[4]This figure is estimated by Hanlon et al. (2010)

3. Direct Dividend Transfers: A Positive Analysis

A simple but critical condition for the implementation of any proposal is that it is aligned with the interests of the political agents charged with determining policy choices. Above, we have synthesized the normative considerations underlying the policy's rationale. However, if no leader can perceive personal benefits to its implementation, the policy is highly unlikely to see the light of day. Moss (2011) and Devarajan and Giugale (2012) identify this as one of the proposal's major obstacles.

However, in this instance it is not unreasonable to assume that some leaders may find DDTs attractive. Given the proven benefits of cash transfers to the welfare of recipients, any leader seeking to gain broad-based favor with citizens is likely to consider the direct transfer of resource dividends as a serious policy option (Manacorda et al. 2011). Below we consider the conditions necessary to maximize the likelihood of this outcome.

3.1 Technology and Incumbency Advantage

Before we introduce the basic conceptual framework, we must first discuss two concepts that have significant implications for our analysis. The first relates to *technology*, or, more specifically, the means through which direct transfers depart central exchequers and arrive at citizens' households. Without constructing an effective means of identifying individuals and transferring cash to them, the policy is not a viable option for leaders.

To date, cash transfer programs are said to reach a total of 110 million families in 45 countries (Hanlon et al. 2010). Devarajan and Giugale (2012) note that 35 African countries already identify certain citizens for the purposes of cash transfers as part of social assistance programs, while India is almost a third of the way through issuing unique identification codes to its citizens as part of the AADHAAR scheme (which, as of January 1st, 2013, also facilitates a direct cash transfer program targeting citizens below the poverty line). Gelb and Decker (2011) survey comprehensively the technological options available to policy makers who wish to transfer cash directly to citizens. They observe that, thanks to advances in biometrical technologies, it is now simple and relatively inexpensive to identify every citizen in a country. The conclude that "[t]he only

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barriers to cash transfers are no longer technical, but political." The most recent direct evaluation of biometrically authenticated payment methods comes from Muralidharan et al. (2014), who exploit the randomized roll out of modernized employment and pension payments schemes in Andhra Pradesh, India. The switch to biometric smartcards resulted in significantly less corruption, higher payments and faster, more predictable transfers "without substantially altering fiscal burdens on the state". The cost of implementation was $4.25 million, while the value of time saved and the reduction in leakage amounted to $4.44 million and $38.7 million per year, respectively.

With that in mind, we proceed in this model under the assumption that governments can identify individual citizens and directly transfer money to them at a negligible cost: there are no technology constraints on DDTs.

The second assumption concerns a feature of electoral politics that is particularly prominent in less developed countries: *incumbency advantage*. This concept simply reflects the fact that, in some countries, incumbents enjoy an electoral advantage over challengers beyond the relative appeal of their policies or their relative skill levels. This may be due to levels of awareness and visibility of the incumbent amongst the electorate; it may be due to the risk preferences of voters (who may prefer to stick with what they know); or it may reflect the suite of options uniquely available to incumbents to influence elections, such as signal spending, ballot fraud, patronage and repression (a theoretical consideration of some these options in an African electoral contest is provided by Collier and Vicente 2012, and in a general context by Caselli et al. 2013).

The strongest empirical evidence for the existence of large incumbency advantages in electoral competitions comes not from the nascent democracies of Sub-Saharan Africa, but rather from established western democracies (Gelman and King 1990). This literature also identifies the casual effect of incumbency on reelection, separating the selection effect of high quality candidates from the effect of incumbency *per se* (Ansolabehere et al. 2000; Lee 2008; Levitt and Wolfram 1997). It is not difficult to imagine the significant role it may play in modern day elections in some less developed countries.

3.2   The Set-Up

Having discussed our technology assumption and the concept of incumbency advantage, we can now proceed to introduce a simple model of electoral competition in resource-rich countries.

We consider one incumbent party i and one challenger party c in pre-election period t_0. There has been a recent discovery of substantial natural resource deposits, from which rents R are projected to accrue in the post-election period t_1.

Leaders are assumed to be Leviathan,[5] maximizing expected personal consumption in functions $U_{i,c}$. For the moment, the median voter's utility is increasing linearly in private consumption. In order to curry favor with the electorate, therefore, both the incumbent and the challenger propose to transfer shares S and C respectively of projected resource rents R directly to citizens in the form of DDTs. In this basic framework, we assume that proposals are credible and binding, and that there are only two periods.

The incumbent perceives his probability of electoral victory as a function ρ of his DDT proposal S, the challenger's DDT proposal C, and a known incumbency advantage $\bar{A}$, such that $\rho'(S) > 0$, $\rho'(C) < 0$, and $\rho'(\bar{A}) > 0$. While Moss (2011) and Gillies (2010) provide anecdotal accounts of political support for cash transfers in Alaska and Brazil, by far the most robust evidence for this relationship is identified by Manacorda et al. (2011), who find that beneficiary households of the PANES anti-poverty cash transfer program in Uruguay are 11 to 13 percentage points more likely to favor the current government relative to the previous government.

The incumbent then derives utility from expected rents in t_1, which will accrue only if he remains in power following the election. The objective function is thus:

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[5] The term 'leader' is broadly construed as the political elite, characterized by the incumbent or challenger parties.

$$U_i = \rho(S, C, \bar{A})[R(1 - S)] \tag{1}$$

where $\rho(.)$ is the probability of political survival, and $R(1 - S)$ is post-transfer rents from natural resources in t_1. Similarly, the challenger's problem is given by:

$$U_c = [1 - \rho(S, C, \bar{A})][R(1 - C)]. \tag{2}$$

We characterize the probability function ρ as:

$$\rho(S, C, \bar{A}) \equiv \frac{1}{2} + S - C + \bar{A}, \tag{3}$$

where $S, C \in [0,1]$ and $\rho(.) \in [0,1]$, so that:

$$[1 - \rho(.)] = \frac{1}{2} + C - S - \bar{A}. \tag{4}$$

This characterization of ρ has many attractive properties for this analysis. It satisfies our conditions $\rho'(S) > 0$, $\rho'(C) < 0$, and $\rho'(\bar{A}) > 0$, and it is consistent with the assumption that the median voter supports cash transfers. It also satisfies the necessary conditions that (i) the challenger's probability of election victory $1 - \rho(.)$ is symmetrical, and (ii) that, when there is no incumbency advantage A, and where proposals are identical ($S = C$), then each party expects election victory with probability 0.5.

The incumbency advantage A therefore has the following properties:

$$C - S - \frac{1}{2} \leq A \leq C - S + \frac{1}{2}. \tag{5}$$

A is necessarily bounded such that $-1\frac{1}{2} \le A \le 1\frac{1}{2}$, where $A = 0$ represents no incumbency or challenger advantage, and $A = 1\frac{1}{2}$ represents a complete autocracy.[6]

This gives respective utility functions:

$$U_i = (\tfrac{1}{2} + S - C + \bar{A})[R(1 - S)], \tag{6}$$

and

$$U_c = \left[1 - \left(\tfrac{1}{2} + S - C + \bar{A}\right)\right][R(1 - C)]. \tag{7}$$

3.3   Analysis: Basic Model

Each party chooses its optimal transfer share in a non-cooperative game. The incumbent chooses $S^*(C, \bar{A})$ to maximize U_i, giving first order condition:

$$\frac{\partial U_i}{\partial S} = -\frac{1}{2}R + R - 2RS + RC - R\bar{A} = 0, \tag{8}$$

and the optimal transfer share:

$$S^* = (1 + 2C - 2\bar{A})/4. \tag{9}$$

In a similar vein, the challenger's first order condition and optimal transfer share are given by:

$$\frac{\partial U_c}{\partial C} = -\frac{1}{2}R + R - 2RC + RS + R\bar{A} = 0, \tag{10}$$

$$C^* = (1 + 2S + 2\bar{A})/4. \tag{11}$$

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[6] We do not explicitly consider a case of 'challenger advantage', where $A < 0$.

Each party is fully informed of its opponent's reaction function. As such, both parties will adjust their optimal shares in an iterative game until they arrive at an equilibrium point, from which any deviation will provoke a reaction from the opposing party that results in a net loss of utility, i.e., where reaction functions $S^*(C, \bar{A})$ and $C^*(S, \bar{A})$ intersect.

We illustrate this graphically in Figure 1 for the case where there is no incumbency advantage ($A = 0$). On the y-axis is the incumbent's proposed transfer share S, and on the x-axis is the challenger's proposed transfer share C. We plot $S^*(C, \bar{A})$ and $C^*(S, \bar{A})$, which describe the optimal proposal by the incumbent and the challenger respectively for a given proposal by their opponent. The equilibrium outcome is where both parties will propose to transfer one half of R directly to citizens.[7] We also show equilibrium outcomes for the case where $A = 0.75$ and for the case of a total autocracy ($A = 1.5$). We see that, as A increases, the optimal proposal for the incumbent S^* approaches zero, while the optimal proposal for the challenger C^* approaches one, resulting in a corner outcome at full autocracy.

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[7] The challenger's function is rearranged as $S = 2C^* - \bar{A} - \frac{1}{2}$. If any party deviates from the equilibrium, their opponent will react with a proposal that will result in a net loss of expected utility for the first mover. The iterative process will continue until both parties return to equilibrium. For example, if the challenger proposes $C = 0.75$, the incumbent will react by proposing $S = 0.625$, forcing the challenger to propose a lower share still. The process ends when both parties propose 0.5.
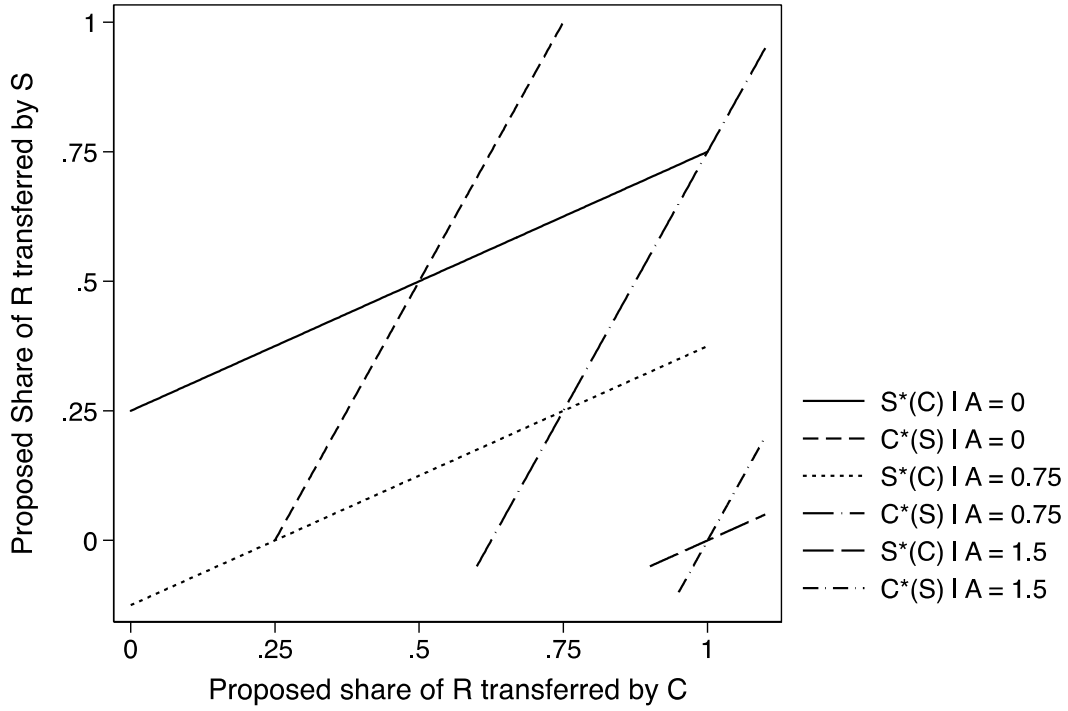
Fig 1: Equilibrium at A=0, A=0.75 and A=1.5

More generally, we can say that, in equilibrium:

$$S^* = \frac{1}{2} - \frac{1}{3}\bar{A},$$

$$C^* = \frac{1}{2} + \frac{1}{3}\bar{A},$$

(12)

and

$$\rho_s(.) = \frac{1}{2} + \frac{1}{3}\bar{A},$$

$$\rho_c(.) = \frac{1}{2} - \frac{1}{3}\bar{A},$$

(13)

where $\rho_s(.)$ and $\rho_c(.)$ indicate the probability of electoral victory for the incumbent and challenger respectively.

This simple approach yields some notable insights:

- Each party's optimal transfer share is increasing in its opponent's proposal;
- With no incumbency advantage, each party proposes to transfer one half of resource revenues at equilibrium, and each party expects electoral victory with probability 0.5. Hence, the expected share of rents transferred to citizens is 0.5;
- The incumbency advantage forces the challenger's optimal proposal upward, while simultaneously decreasing the incumbent's optimal proposal and increasing the probability of an incumbent victory;
- The expected share of total resource rents transferred to citizens is decreasing in the incumbency advantage, as:

$$E[D] = \rho_s(.)[S^*] + \rho_c(.)[C^*]$$

$$E[D] = 2\left(\frac{1}{2} + \frac{1}{3}A\right)\left(\frac{1}{2} - \frac{1}{3}A\right)$$

$$\frac{\partial E[D]}{\partial A} = -\frac{4}{9}A \tag{14}$$

where D is the share of resources transferred to citizens at t_1. ∎
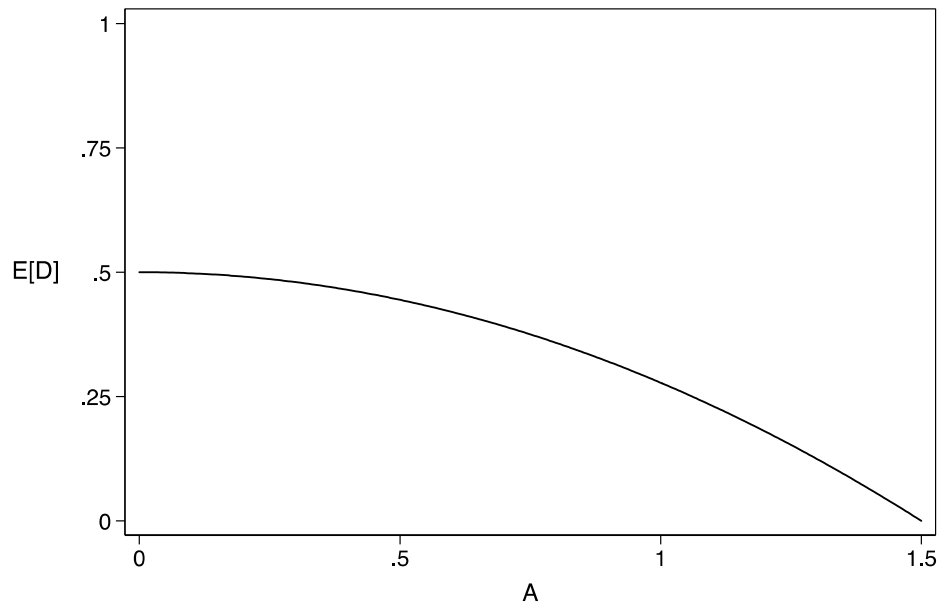
This relationship is presented graphically in Figure 2.

Fig 2: Expected Direct Dividend Share E[D] and the Incumbency Advantage (A) at
Equilibrium S, C

3.4   Discussion

Although simple, this framework aids our analysis in two ways: it allows us to consider some fundamental conditions under which DDTs may become a reality in resource-rich countries; and it provides us with a basis on which to consider further extensions and features in Section 4.

The incumbency advantage clearly represents a major determinant of DDT adoption. Without a credible threat of electoral punishment, leaders are unlikely to distribute dividends to ordinary citizens. This is consistent with the pattern of DDT adoption observed so far: Alaskans and Albertans are considerably more likely than citizens of Congo-Brazzaville and Congo-Kinshasa to hold their leaders accountable in an electoral competition. If those examples may seem obvious, it is worth noting that, although far from a model democracy, Mongolia, which has recently launched a DDT program, has maintained regular transfers of power over five successive parliamentary elections (1990, 1992, 1996, 2000, 2004) and four presidential elections (1993, 1997, 2001, 2005) since independence (Landman et al. 2005).

An example, perhaps, of a high *A*, high *C* environment is the 2006 presidential election in Venezuela, in which opposition candidate Manual Rosales proposed to distribute directly a share of oil revenues to households in the form of a cash transfer. Despite its initial support among the electorate, the transfer lost popularity sharply when it was advocated by Rosales, prompting some confusion among political analysts. Rodríguez et al. (2012, pp. 27) suggest that the proposal "was not judged according to its merit, but instead according to who proposed it […] the explanation is consistent with the political polarization that was prevalent at the time." It is worth recalling that this was an environment characterized by a powerful incumbent who enjoyed significant discretion over the use of an opaque fund which was found subsequently to discriminate against citizens who expressed support for a failed recall referendum in 2004 (Hsieh et al. 2011).

These examples highlight the primacy of the incumbency advantage as a barrier to DDT adoption, suggesting that resource-rich countries with recent or regular transitions of power (e.g., Ghana, Zambia) are more likely to implement DDT programs than autocratic counterparts.

4. Extensions

In this section, we relax some of the stronger assumptions of the model and consider alternative scenarios that may affect the implementation of DDTs in a typical developing country. We proceed with factors that affect the allocation of rents between the leaders' private consumption (embezzlement) and public welfare, characterized thus far by DDTs. We then consider factors that affect the allocation of rents between DDTs and other welfare-enhancing outlays, namely public goods. We finally introduce the option of investment in power-preserving activities for leaders. In each scenario, we consider how the expected share of DDTs may be affected by the introduction of new features to the model.

4.1   Credibility and Uncertainty

First, we describe a case where the challenger's choice set is further limited by a participation constraint and voter uncertainty. We first define the conditions necessary for a challenger to participate credibly in the election, before relaxing the assumption of full information in the economy.

4.1.1   Participation, Credibility and the Incumbency Advantage

We consider the case where voters discount the credibility of proposals that are worth less to leaders than the outside option. Assume that both parties incur a cost Q of being in power, which comprises of campaign costs and opportunity costs, and is known to voters. Proposals are now constrained such that the payoff from election victory $R(1 - S)$ or $R(1 - C)$ is larger than Q. Any S or C that violates this condition is not perceived as credible by voters.

This effectively reduces the range of S and C from $[0,1]$ to $[0, (1 - \frac{Q}{R})]$, creating a wedge between $\frac{Q}{R}$ and 1 wherein the incumbent and challenger cannot make credible proposals.[8] This constrains the challenger from proposing his optimal share once the incumbency advantage A reaches a threshold point A^*, above which $C^* > 1 - \frac{Q}{R}$. This can be found by substituting $\frac{1}{2} + \frac{1}{3}A^* = 1 - \frac{Q}{R}$, giving:

$$A^* = \frac{3}{2} - \frac{3Q}{R} \tag{15}$$

Intuitively, this threshold incumbency advantage A^* is decreasing in the size of the outside option Q, and increasing in the size of natural resource rents R. If a given A is larger than A^*, then the challenger is constrained from offering C^*.

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[8] The assumption $\frac{Q}{R} < 1$ can be construed as a participation constraint. No candidate will enter the contest if his outside option is higher than the maximum payoff.

A numerical example is presented graphically in Figure 3. Assume that the incumbency advantage A is exogenously given as 1. In that case, the equilibrium policies are found at point a, where $S^* = \frac{1}{6}$, $C^* = \frac{5}{6}$ and $E[D] = \frac{5}{6}\left(\frac{1}{6}\right) + \frac{1}{6}\left(\frac{5}{6}\right) = \frac{10}{36}$.

Suppose that $\frac{Q}{R} = \frac{1}{4}$, so that both parties must now choose policies $S, C \in [0, \frac{3}{4}]$. This restricts the challenger from choosing his optimal policy $C^* = \frac{5}{6}$, and so he must instead choose his upper bound $C1 = \frac{3}{4}$, which gives the incumbent an optimal $S1 = \frac{1}{8}$.

Fig. 3: Challenger Constraints when $A > A^*$
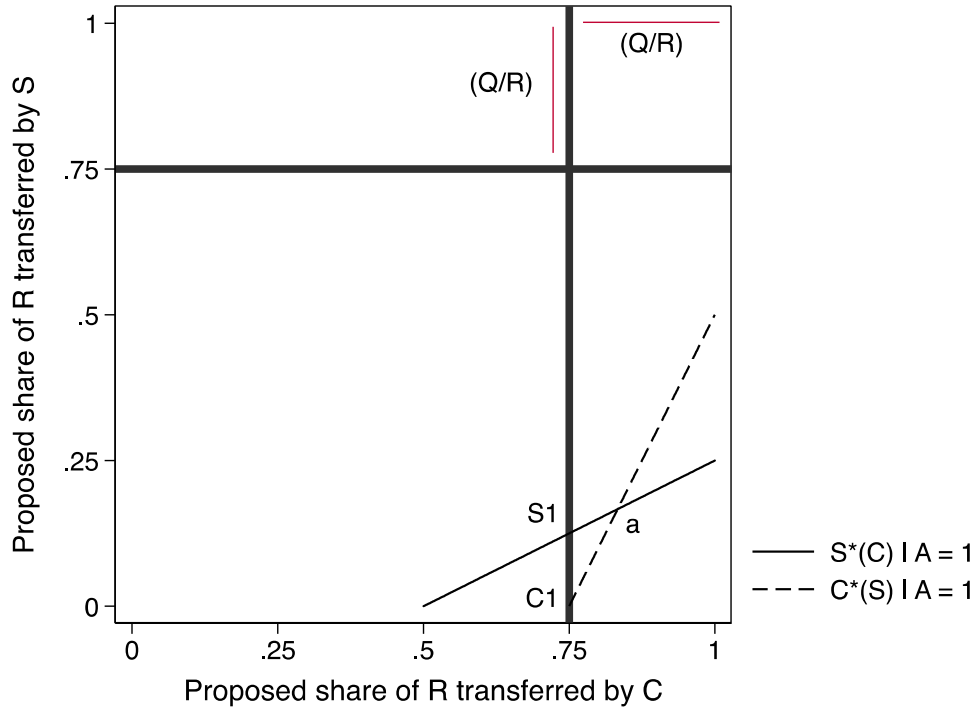
This new equilibrium outcome gives a lower expected dividend of $E[D] = \frac{7}{8}\left(\frac{1}{8}\right) + \frac{1}{8}\left(\frac{3}{4}\right) = \frac{13}{64}$. The shift from point a to points $C1$ and $S1$ lowers C by $\frac{1}{12}$ and S by $\frac{1}{24}$, while simultaneously increasing $\rho_s(.)$. In general, we can say that, for a given incumbency advantage $\bar{A}$,

$$(E[D]|(A^* < \bar{A})) < (E[D]|(A^* > \bar{A})). \qquad (16)$$

A threshold A^* lower than a given $\bar{A}$ will reduce the expected total dividend. In other words, if the challenger is restricted by the incumbency advantage and the participation constraint from credibly offering his optimal proposal C^*, the expected direct dividend transfer to citizens is lower than it would otherwise be, all else equal.[9]

4.1.2   Uncertainty

In this discussion we relax the assumption of full information in the economy. Specifically, we consider the case where voters discount further the credibility of the challenger's proposal C. Under the assumption that the resource discovery occurred during the term of the current incumbent, voters may be uncertain about the level of information available to the challenger on the size of the resource deposits.

Following on from Section *4.1.1*, if the challenger assumes resource rents $\hat{R} > R$, there is a higher likelihood that he will choose $C^* > 1 - \frac{Q}{R}$, which voters would not deem credible. As a result, risk-averse voters will discount the challenger's proposal from C^* to θC^*, where $0 \leq \theta \leq 1$ and θ represents voters' risk preferences.

In the first case, we assume that leaders are unaware of θ. If the electorate exhibit any risk aversion (i.e., $\theta < 1$), then the challenger's proposal is discounted to θC^*, leaving a probability function $\rho_s(.) = \frac{1}{2} + S - \theta C + A$. In other words, any $\theta < 1$ increases the probability of re-election for the incumbent by $(1 - \theta)C$. Where there is no incumbency advantage (i.e., $A = 0$), this will not affect the expected dividend transfer $E[D]$, as $S^* = C^*$. For all other values of $A > 0$ (i.e. where $S^* < C^*$) risk aversion will decrease $E[D]$.

In the second case, we assume that both parties are aware of the electorate's risk preferences. In this instance, we can simply characterize $(1 - \theta)$ as another form of

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[9] It is important to note here that the effect of this credibility constraint is symmetrical in the absence of an incumbency advantage.

incumbency advantage. As a result, risk aversion will exhibit the same properties as A: more risk aversion will increase C^* and $\rho_s(.)$, and decrease S^* and $E[D]$.

In this scenario, the provision of reliable information on resource deposits through transparent channels will serve to mitigate the negative effect of risk aversion $(1 - \theta)$ on the expected dividend transfer $E[D]$.

4.2   Resource-Rich Countries and the Incumbency Advantage

In this illustration we consider a simple but important extension. Robinson et al (2006), Jensen and Wantchekon (2004), McGuirk (2013) and Ross (2001), among others, make the case that natural resource rents can lead to higher levels of autocracy over time. The inflow of resource rents provides leaders with both the incentives and the means to increase their incumbency advantage and reduce the threat of electoral punishment. In effect, our previously exogenous incumbency advantage A is now a function of past resource rents R_0, such that $A'(R_0) > 0$. As we illustrate in Figure 3, a higher incumbency advantage will decrease the expected allocation of direct dividend transfers.

It is worth considering the shape of the $\big(E[D]\big|(A)\big)$ curve in Figure 2. The concavity of the function suggests that an increase in the incumbency advantage at low initial levels has a smaller effect on E[D] than an equivalent shift at higher levels. This implies that leaders in countries with relatively recent resource discoveries may have yet to develop a significant incumbency advantage, and may therefore remain suitable candidates for DDT adoption.

4.3   Direct Transfers, Public Goods and Power-Preserving Activities

We now discuss a richer and more realistic interpretation of the policy choices facing leaders in resource-rich countries. Thus far, political leaders in our model have had two options: consume resource revenues, or allocate revenues to private citizens in the form of direct transfers. In reality, leaders face many more decisions on how best to allocate resource revenues across various activities. Here, we introduce incrementally two

additional spending options: public investment G and power-preserving activities P. Public investments are outlays designed specifically to provide public goods that broadly benefit the electorate. Expenditure P represents all other power-preserving outlays, such as targeted leakage from public projects, direct patronage to influential constituents, clientelism, and repression.

4.3.1 Direct Transfers and Public Goods

We first consider the case of public goods. In addition to direct dividend transfers D, leaders can also generate electoral support by spending a share of revenues G on public investments, such as schools and roads.

In this set up, we interpret $C \equiv D_c + G_c$ and $S \equiv D_s + G_s$. Leaders are still allocating revenues between the electorate $(D + G)R$ and their own consumption $[1 - (D + G)]R$, in accordance with the basic model in Section 3. The incentive underlying all non-personal spending $(D + G)R$ is to gain electoral support from voters. The problem facing leaders is to identify the bundle (D, G) that maximizes the median voter's utility.

To find this, leaders must consider the utility function of the median voter. Until now, we have effectively assumed that citizen utility is linear in private consumption, i.e. $U_m = \tilde{c}$, where $\tilde{c}$ is a function of direct transfers D. However, if we extend this interpretation to a standard quasi-linear function with diminishing marginal returns from private consumption c, and constant returns to public goods g, e.g., $U_m = \ln c + g$ where $g = \lambda G$, it becomes clear that there will eventually arrive a point where the marginal allocation to G is worth more to the median voter, and thus the leader, than the marginal allocation to D.[10]

We illustrate an example of this in Figure 4. We first consider the case where hG represents the relationship between public expenditure G and citizen utility U_m, (i.e. $\lambda = $

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[10] An alternative citizen utility function could weaken the assumption of separability between c and g by assuming a Cobb-Douglas style function, wherein utility derived from c is dependent on g. This would simply lower the threshold D^* at which $U'(D) = U'(G)$.

h), and the concave $f(D)$ represents the relationship between direct transfer D and U_m. The line $f'(D)$ plots the slope of $f(D)$. As far as point a, the returns to direct transfers D are higher than the returns to public investment G, i.e., $f'(D) > h$. Beyond that point, the leader will optimally allocate to G. We can infer from this case that, in countries with lower initial levels of private consumption, the returns to direct dividend transfer are higher, due to the concavity of c in citizen utility.

We also consider a country with "leaky" public institutions, where the technology λ that transforms public outlays G to public goods g is less efficient, i.e., $\lambda = l$. In this case, the leader will optimally spend revenues on direct transfers until he reaches point b; only thereafter will he invest in public goods.

Thus, in countries with a higher poverty headcount or more inefficient public institutions, leaders will optimally allocate more resource revenues to direct dividend transfers and less to public goods, *ceteris paribus*.
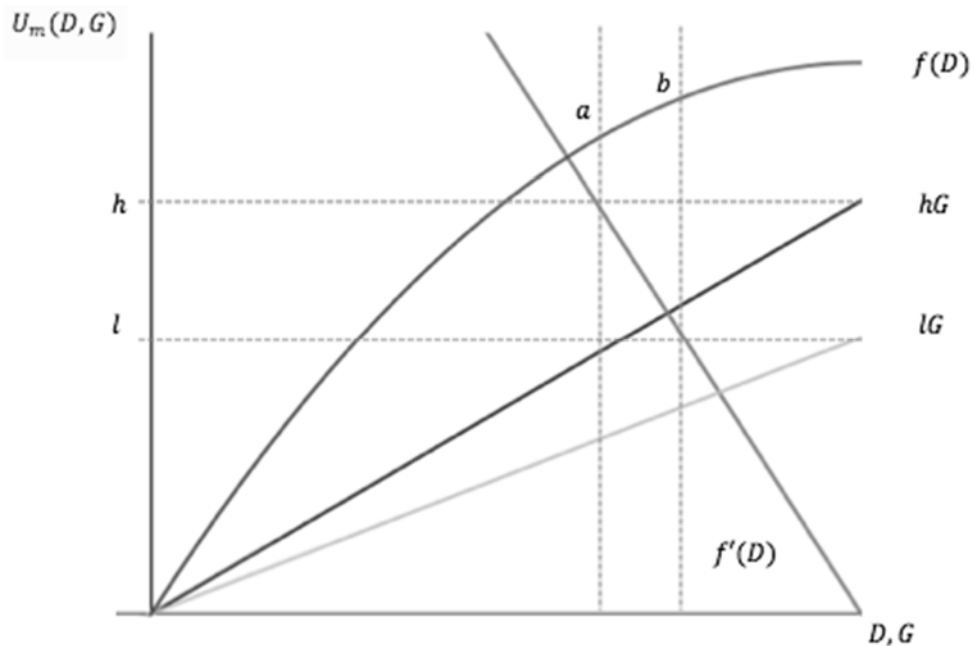

Fig. 4: Direct Transfers and Public Goods

4.3.2 Power-Preserving Activities

An additional option for leaders in resource-rich countries is simply to spend on power-preserving activities P, such as club goods or patronage jobs for politically influential actors and military officers. This could also represent direct investments in repression or ballot fraud. It is defined as any allocation that is intended to increase the likelihood of political survival through the incumbency advantage A, i.e. without adding to the welfare of the median voter.

The relative attraction of this option is determined by the function $A(\psi, P)$, which describes the relationship between self-preserving expenditure P and the incumbency advantage. We make two assumptions on the nature of this function. First, that any effect of P on A depends on a constant ψ, where $\psi = 0$ indicates that budgetary checks and balances are perfect, i.e. there is sufficient accountability to prevent any explicitly power-preserving outlays that do not broadly improve the welfare of citizens. Conversely, as ψ increases there are fewer constraints on the leader's budgetary discretion. Second, we assume that the function $A(\psi, P)$ is S-shaped in P. Initial returns to P are low, as leaders construct costly patronage networks; returns then accelerate as leaders effectively target politically influential actors, before diminishing due to their fixed stock. This relationship is presented graphically in Figure 5.
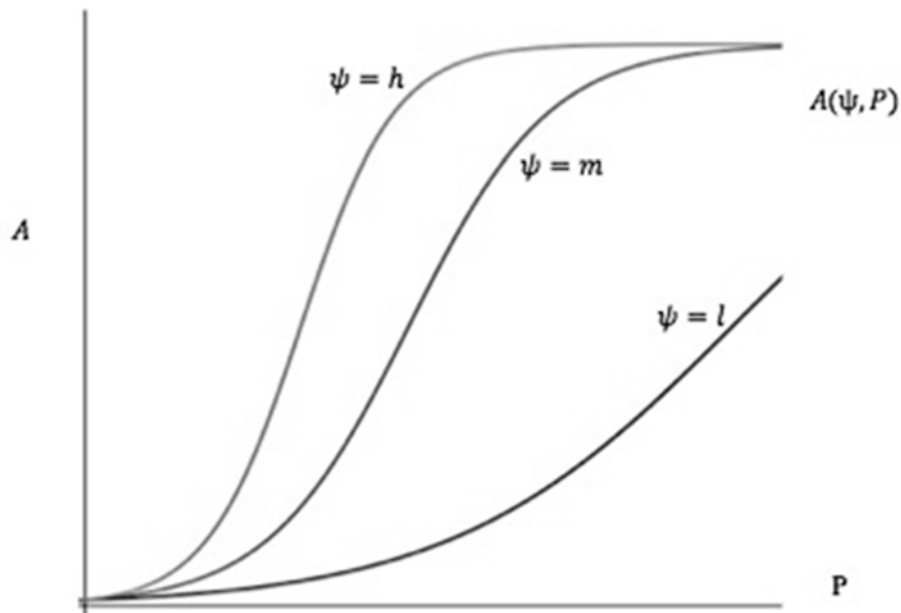

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Fig. 5: Incumbency Advantage and Power-Preserving Expenditure

This interpretation of power-preserving expenditure can give us insights into how leaders allocate resource revenues. Returns to power-preserving expenditure are highest when checks and balances are weak ($\psi = l$), when patronage networks are established and when the stock of influential actors is not exhausted, i.e., where $A(\psi, P)$ is steepest. In these cases, power-preserving expenditure is likely to offer higher returns for the leader than allocating revenues in the form of either direct transfers or public goods.[11]

Recall that a higher incumbency advantage A also results in a lower expected level of direct transfers (or public goods) for citizens. The threat of effective power-preserving expenditure thus represents a significant obstacle to the sustainable adoption of DDTs. Moreover, it is an autoregressive phenomenon: power begets power. This is because, in our simple model of electoral competition in Section 3, a positive incumbency advantage reduces the optimal share S^* of resources that the incumbent must allocate to citizens, which ultimately leaves more resources for power-preserving activities.

In that light, DDT adoption is most likely in countries with transparent and accountable budgetary oversight, where patronage networks are less established (e.g. when there is a political clean slate), and where the initial incumbency advantage is low.[12]

4.4   Ethnic Divisions

In many developing countries, ethnic heterogeneity represents a major challenge to good governance (Easterly and Levine, 1997; Alesina and La Ferrara, 2005). This is particularly true for countries in Sub-Saharan Africa, the most heterogeneous region in the world. With that in mind, it is important to consider the potential effects of fractionalization on the likelihood of DDT adoption.

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[11] It should also be noted that, where patronage networks are not established, power-preserving expenditure is most likely to occur where leaders have a longer time horizon, as leaders facing proximate elections are less certain to benefit from early investments. We discuss this further in Section 4.5

[12] In this case, the same conclusion is true for the provision of public goods.

In our model, ethnic diversity may influence leaders' decisions in three ways. First, in the context of rigid ethnic political cleavages – where votes are effectively "frozen" by ethnic identification – leaders are less certain to benefit politically from broad transfers as in Section 3. Direct transfers to non-coethnics may not necessarily translate to support at the polls, as citizens vote along ethnic lines irrespective of policy proposals. This lowers the relative return of DDTs and public investments for leaders.

The second channel through which ethnic diversity may impact the likelihood of DDT adoption is through its facilitation of patronage politics. The existence of entrenched ethnic networks lowers the cost of establishing patronage channels for the incumbent. In such a scenario, the leader need only sustain extant support from key constituencies to maintain power. Ultimately, salient political cleavages along ethnic lines increase the immediate returns to power preserving expenditures, resulting in a higher incumbency advantage and lower expected value of direct transfers for citizens. We illustrate this relationship graphically in Figure 6, where ELF_{high} and ELF_{low} represent the $A(P)$ curve in countries with and without politically salient ethnic cleavages respectively.
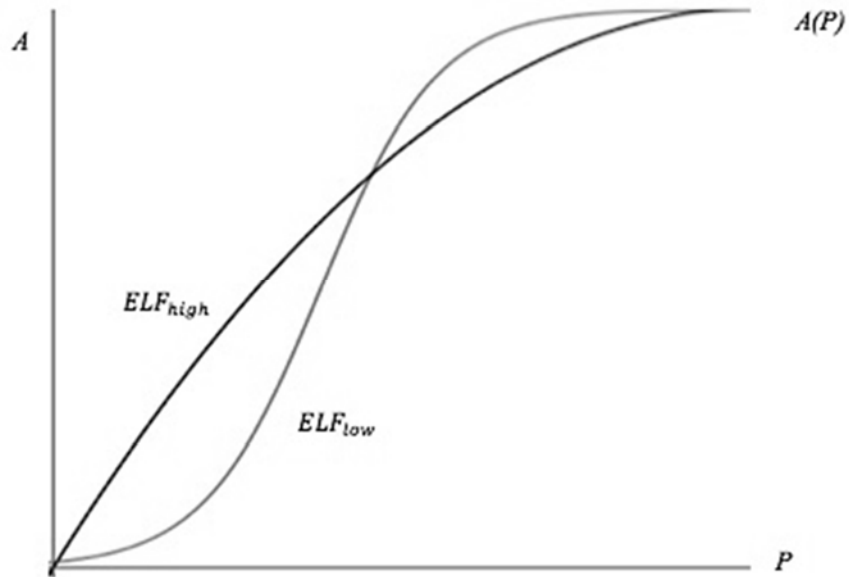

Fig 6: Incumbency Advantage, Power-Preserving Expenditure and Ethnic Diversity

As in Section 4.3.2, the relative attraction of power-preserving outlays can still be mitigated by high checks and balances (i.e., a low ψ): in the presence of strong budgetary oversight, ethnic diversity is less likely to result in a high incumbency advantage.

A final consideration of the role of ethnic diversity in this model points to a potentially positive impact on the likelihood of DDT adoption. Alesina et al. (1999) present early country-level evidence of a negative association between ethnic heterogeneity and the provision of public goods, whereas Miguel and Gugerty (2005) and Habyarimana et al. (2007) provide robust evidence for the micro-level analogy in a Sub-Saharan African context. It is reasonable to interpret from this literature that λ, which represents the efficiency of public expenditure, is likely to be lower in ethnically diverse countries, due to competing policy preferences, coordination problems, or a combination of both. As a result, direct transfers will form a higher share of the optimal government expenditure bundle.

4.5   Non-Binding Proposals

Up to this point, we have assumed that leaders' proposals are binding: any S or C proposed by candidates before an election must translate precisely to the share of revenues allocated to citizens in the following period. An implicit assumption is that the dynamic costs of deviating from a proposal offset the static gains. The costs of voter punishment for broken promises will lower the net present value of power by at least the same magnitude as the benefits gained from breaking them. It is thus optimal for leaders to stick to their promises.

In reality, this assumption will not hold in certain cases. As a first example, we consider a leader facing a strict term limit. He is permitted to stay in power for one post-election period only. We further assume that he is not subject to internal party discipline: the dynamic costs to his party of broken electoral pledges have not been internalized by the

leader.[13] As a result, he is no longer constrained by electoral incentives after the first election. This raises the value of falsely high proposals, while also increasing the returns to any signal expenditures or transfers that he may finance to build pre-election support. Once the election is over, the leader is free to extract rents for personal consumption. The only constraints to this overtly kleptocratic behavior are the threats of revolution or a coup, which can be minimized by well-targeted military patronage or repression. Again, for this outcome to transpire, the leader must not internalize the costs of his voracity to his party: he must neither face the prospect of party discipline after his transfer from power, nor can he care for its long term welfare.

The second challenge to our assumption of binding proposals comes from the long-term value of the incumbency advantage. In the absence of strict term limits, and under the assumption that resource rents are projected to accrue for many years, the net present value of the incumbency advantage increases substantially. It is possible in this case that the marginal benefit of using earmarked DDT funds to invest instead in power-preserving activities is higher than the costs of voter punishment. A relatively flat $A(P)$ curve (either due to weak patronage networks or high budgetary oversight) will lower the likelihood of this potential drift to autocracy.

5. Discussion and Policy Implications

In this paper, we analyze the case for direct dividend transfers in newly resource-rich countries from a positive perspective by explicitly modeling the policy choices of an incumbent politician and a challenger. We assume that politicians maximize personal consumption, and explore the conditions under which they are most likely to adopt direct transfers as a rational policy in the context of electoral competition.

Our findings are best considered in two stages. First, we identify factors that are predicted to determine the share of natural resource rents allocated between the leader's private use $R(1 - D - G)$ and public welfare in general $R(D + G)$, which could take the form of DDTs and/or the provision of public goods. We then identify the conditions that will

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[13] In reality, this may occur when the leader dispels internal dissent through patronage jobs or repression.

affect the share of welfare spending that will be allocated between DDTs D and public goods G.

In the absence of any incumbency advantage, an election contested between an incumbent and a challenger over the allocation of new natural resource revenues will result in each party proposing to allocate a 50% share to public welfare. As each party expects victory with a probability of 0.5, citizens will receive 50% of resource rents with full certainty.

For a higher exogenously endowed incumbency advantage, the incumbent's optimal proposed transfer is lower, while his probability of political survival increases. This results in lower welfare spending for citizens. At the maximum incumbency advantage, citizens will receive no share of resource revenues.

Higher resource rents will result not only in higher *levels* of welfare spending, but also higher expected *shares*, as the challenger's proposal will carry more credibility with voters. More transparent and accessible information on the level of resources will also increase the expected resource dividend for citizens. These propositions only hold if there is a strictly positive incumbency advantage.

Expenditure on public welfare is expected to be lower in countries with a longer history of resource extraction, owing to evidence of its impact on the incumbency advantage. Welfare spending will also be lower where leaders can expect a higher return to power-preserving activities; that is, where there is less budgetary accountability (or checks and balances) and where patronage networks facilitate targeted spending.

Once political competition has determined the share of resource rents to be allocated to citizens, other factors determine the proportions of the allocation to be spent on either direct transfers D or public goods G. Countries with a higher poverty headcount, i.e., a greater share of voters with a higher marginal utility of consumption, and less efficient

public institutions will spend a higher share on direct dividends and a lower share on public goods.

Rigid ethnic voting patterns are likely to undermine the political value of broad-based transfers relative to patronage, clientelism, and other power-preserving activities. In addition, well-established ethnic constituencies may lower the initial costs of these options, further reducing the relative attraction of DDTs and public goods. However, the adverse effect of ethnic diversity on the provision of public goods will increase the size of DDTs relative to public investments, once other factors have determined the combined share.

Finally, and perhaps obviously, leaders who are not constrained by electoral incentives – for example, those facing term limits and no internal party discipline – are more likely to renege on policy proposals and extract more rents for personal benefit. Furthermore, in the absence of strong checks and balances and high patronage costs, leaders with a longer time horizon are also more likely to break their electoral pledge and invest instead in their incumbency advantage.

These results help us to identify countries in which the political benefits of DDT adoption are relatively higher for rational leaders. Obvious candidates include countries with lower incumbency advantages; this is one reason why DDTs exist in Alaska and Alberta, but not in Africa. It also helps to explain the "Money of Trust" program in Mongolia,[14] which has had several transfers of power in the past decade. Countries in which resource discoveries are relatively recent also stand out as candidates for DDT adoption. Under both of these criteria, Ghana emerges as potentially suitable case. Countries in which new political 'clean slates' have emerged are also strong candidates, as incumbency advantages and patronage networks are relatively undeveloped. With recent political transformations in mind, it is also possible that Zambia may be open to DDT adoption.

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[14] See Fritz (2014) for a discussion of the competition among Mongolian political parties to offer cash transfers to citizens, initially targeted to children but then subject to various ad hoc adjustments as fiscal conditions changed.

Free and independent media will also increase the likelihood of a sustainable adoption in these countries, due to their effect on (i) the contestability of elections; (ii) the transparency of information on resource deposits and management; and (iii) budgetary checks and balances. International transparency initiatives, such as the Extractive Industry Transparency Initiative (EITI), the Natural Resource Charter, and organizations such as the Revenue Watch Institute all have potentially significant roles for similar reasons.

Furthermore, to the extent that implementing the technology necessary to administer the transfers represents a fixed cost for an interested leader, external actors could potentially encourage adoptions by providing assistance in this area. This would be most effective in countries where the political rationale for welfare spending is strong, but weak institutions lessen the attractiveness of providing public goods as an optimal modality.

While our positive consideration of DDT adoption by rational leaders identifies an extensive list of conditions under which the policy is most likely to be sustained, it is worth considering one final feature that has reflected the success of Conditional Cash Transfer Programs in Latin America: neighborhood proliferation. Early and robust evidence of significant gains from Mexico's PROGRESA / Oportunidades programs served to bolster demand for similar programs in neighboring Latin American economies, eventually resulting in its proliferation across over 40 countries worldwide. To that end, experimental evidence of successful DDT pilots in a small number of African countries may yet provide the foundation for a broader pattern of adoption in time.

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Appendix A: Whither Taxation?

Much of the normative discussion on DDTs emphasizes the potentially important role of subsequent taxation after the allocation of transfers. This has been argued to be a central safeguard against the threat of rentier behavior, and may even result in better public goods provision. A key barrier to this aspect of the proposal, however, is political feasibility: what leader would willingly risk increasing the scrutiny on his actions by taxing citizens?

One answer may come from the notion of 'sticky' consumption. In Alaska, it is considered 'political suicide' to propose a cut in the direct dividend transfer scheme (Moss, 2011).[15] Collier et al. (2009) note that, once formed, consumption habits are difficult to break, and the political costs to cutting a regular stream of income are high. Moreover, a large body of work in behavioral economics stems from the concept of loss aversion, whereby the utility gained from avoiding loss is higher than the utility lost from avoiding gains.

This could lead to a scenario where leaders are politically unable to cut DDTs saliently. Thus, in the event of an *unanticipated negative export commodity price shock*, leaders must either generate additional revenue, or increase the DDT share of resources in order to maintain the same level. Due to the decreasing returns to consumption for citizens, a part of the optimal response to this shock would involve levying a tax on rich citizens (who lose less utility from taxes than do poorer citizens) to maintain the level of DDTs, thus avoiding a more politically costly loss in aggregate welfare.

A second case for taxation may arise when the political returns to public investment are higher than the returns to direct transfers (e.g., when the leader arrives at point a or point b in Figure 5). Taxing citizens can emerge as the

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[15] Recent demonstrations over proposed cuts to fuel subsidies in Nigeria also come to mind.

optimal strategy for a self-interested leader to fund public goods for two reasons. The first is analogous to the previous example: when the effect of tax changes on citizens' utility is non-linear, taxing relatively rich citizens to fund public goods (which exhibit constant returns) will increase the aggregate utility of citizens without decreasing the leader's personal consumption. Second, Devarajan et al. (2011) outline how taxation could lead to the more efficient provision of public goods by increasing the monitoring efforts of citizens, and thus the costs of public mismanagement. In a reduced form interpretation, taxing citizens effectively increases λ, and thus $g'(G)$, resulting in more public goods for a given public outlay. The larger is $\lambda'(\tau)$, the higher is revenue from taxes.

Thus, in the leader's political calculus, taxation may be attractive as it exploits diminishing returns to consumption to fund public goods, and it may also increase the efficiency of public outlays. However, the effect of taxes on λ may also be mirrored by an effect on ψ. In other words, to the extent that the scrutiny elicited by taxation can improve the efficiency of public investments, it also increases the demand for budgetary accountability, which will lower the leader's returns to power-preserving expenditure. The leader chooses therefore an optimal τ that takes into account the politically popular transfer from the income of the rich to the provision of public goods, the efficiency gains in public investments, and the personal costs of higher budgetary scrutiny.

One additional feature that can affect this optimal tax rate is the option of financing externally produced public goods. Thus far in this discussion, public goods are assumed to be produced domestically, and, as a result, taxation can improve technological efficiency by provoking scrutiny. However, if leaders have the option to pay foreign actors to undertake public projects that bypass the "leaky" government systems (as in the DRC "resource for infrastructure" deal),

they may benefit from the delivery of public goods without incurring the cost of higher budgetary scrutiny.[16] This is typified most accurately by the role of China in many resource-rich African countries. Thus, at the margin, the existence of foreign actors who offer to complete public infrastructure projects efficiently in exchange for resource rents will lower the rate of domestic taxation on citizens.

To summarize, the countries most likely to impose taxes on citizens are those that experience negative shocks to export commodity prices (or output), and in which DDT levels are sticky downwards. Furthermore, countries in which the returns to public goods are higher than the returns to private goods are more likely to impose taxes, particularly if the resultant escalation of citizen scrutiny improves the efficiency of public investment. In both cases, taxes are likely to be imposed only on richer citizens, for whom the marginal utility of consumption is lower. The likelihood of taxation is reduced by the availability of foreign actors who are willing and able to undertake public projects more efficiently.

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[16] In some situations, external scrutiny may be more restrictive for an incumbent than domestic scrutiny. We abstract from this possibility in our discussion.

Appendix B: A Malawian Case Study

A clear message from this analysis is that policy makers need to remain cautious in their expectations for widespread, sustainable adoption. An illustration from Malawi shows starkly how weak checks and balances can exploit the fragility of comprehensive transfer programs. Against the background of a food crisis, the 2004 elections were contested in part on proposals for major input subsidy programs for farmers. The election was won by Bingu wa Mutharika, the party successor to outgoing president Bakili Muluzi. However, shortly afterwards, Muluzi and loyal MPs withdrew public support for Mutharika, effectively leaving him with both a low incumbency advantage A and weak patronage networks.

In the face of low A and low $A'(P)$, Mutharika announced the details of a large-scale subsidy program designed to transfer coupons to farmers that allow access to fertilizers at a discounted price from any distributor. For the first two years, the program successfully targeted small-scale farmers in an equitable manner, reflecting the broad-based welfare enhancing characteristics of a DDT program. However, as the demand for accountability diminished (on this occasion from foreign donors), Mutharika increasingly availed of weak internal checks and balances to gradually politicize the distribution system by, for example, assigning the duty of allocating coupons to chiefs, MPs and local politicians. By the time of the election in 2009, the program had come to represent a powerful political tool, helping him to win 65% of the vote, despite proposals from the main challenger to broaden the program further. In the end, Mutharika's investment in A helped to offset a high C and maintain power. Having secured victory, and being ineligible to run for a third term, Mutharika reduced substantially the scope of the program in the year following the election.