

The Institutional and Psychological Foundations of Natural Resource Policies

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Abstract

The pressures of political interests which drive the resource curse are well-understood. But ordinary citizens are usually cast both as the innocent victims of this process, and as the potential solution if only governments could be made more accountable to them. This paper draws upon recent developments in social psychology to discuss the formation of mass opinions on two aspects of resource ownership. One is the spatial assignment of ownership between local and national claims, which has been a significant cause of conflict. The other is the assignment of revenues between current consumption and future investment, which has usually been excessively biased towards the former. I suggest why, in the absence of an active government communications policy to offset them, known psychological biases may interact with resource discoveries to generate mass opinions which contribute to these problems.

1. Introduction

The resource curse is predominantly political, generating a range of dysfunctional rent-seeking behaviour. Governments have less need to tax the incomes of citizens. In consequence, they have less incentive to adopt policies that increase incomes and they provoke less scrutiny from tax-resistant citizens. With weak scrutiny and large rents, political power becomes personally valuable, attracting crooks and inducing conflict. These issues have been thoroughly analysed both theoretically and empirically. On this conventional political economy analysis of self-interested power the solution lies in enhanced accountability to citizens through measures such as greater transparency. In this paper I suggest that this analysis can be complemented by understanding how a resource discovery is likely to affect the identities, norms and narratives prevalent in the population and how, in turn, these changes in beliefs might affect public policy. The public policy problem posed by natural resources is even more severe than implied by the conventional analysis. It is not merely that scrutiny is a public good, undersupplied due to citizen free-riding. Rather, the changes in popular beliefs may themselves lead to policy deterioration: specifically, to conflict and populism.

There is a clear causal link between natural resources and organized private violence, ranging from wars of secession, such as the attempted secessions of Katanga and Biafra, to mafia-style predatory gangs, and indeed the origins of the mafia itself (Klare, 2002; Berman et al., 2014; Buonanno et al., 2015). There is also clear evidence on populism, defined as a bias towards consumption and white elephant public spending. Case study evidence on low savings rates is set out in Collier and Venables (2011), while Bhattacharyya and Collier (2013) find that controlling for income, resource-rich countries accumulate *less* public capital than resource scarce-scarce ones.

If, in response to a resource discovery changes in popular beliefs tend to induce conflict and populism, efforts to make government accountable to citizens need to be matched by an active process of building citizen understanding. While there is now a mass of research on what economic policies are appropriate for resource management, social science has as yet neither recognized the importance of citizen beliefs, nor confronted how the pressures that lead to damaging beliefs can be countered.

The economic rents on natural resources have no natural owners: the assignment of ownership is entirely a social construct. I will focus on two critical aspects of this assignment in which known psychological biases can lead to conflict and populism. These are the spatial and temporal distribution of beneficiaries. Spatially, natural resources are location-specific. How might awareness of psychological biases improve our understanding of how ownership is assigned as between the community, the region and the nation, and are there ethical principles by which this assignment can be judged deficient? Temporally, the exploitation of a non-renewable natural asset such as an oilfield generates an unsustainable stream of benefits. How might awareness of psychological biases improve our understanding of how these benefits are assigned between the

current and future generations, and are there ethical principles by which this assignment can be judged deficient?

In addressing these questions conventional economic analysis has little to offer. It assumes that behaviour is shaped directly by self-interest determined by exogenously given preferences. Self-interest is informed either by a Bayesian process of continuous learning from experience, or by rational expectations (in aggregate, people behave as though they ‘know the model’). But this simple depiction is increasingly being challenged. New insights from psychology are now being applied to the context of development, the 2015 World Development Report providing an excellent overview of the literature (World Bank, 2015). Akerlof and Kranton (2011) have pioneered ‘identity economics’ in which preferences and norms are set by identities derived from social interaction. It is already established that geographic endowments affect ethno-linguistic identities (Michalopoulos, 2012). Understanding why there are likely to be changes in identity consequent upon resource discovery can improve our understanding of why conflict occurs. Psychologists have found that decision processes are often not characterized by careful weighing of observed evidence. Haidt (2012) has shown that people are adept at self-deception; their interpretation of evidence being warped by being reweighted to conform to their moral priors and self-interest. Again this can provide insights on the link between resources and conflict: new differences in interests are compounded by more potent divergences in norms. Kahneman (2011) has established that because people often rely upon low-effort ways of taking decisions (‘fast thinking’), they are exposed to known biases. One of these biases, excessive discounting of the future, may provide insights on the tendency of resource discoveries to lead to populism. Zak (2014) and other psychologists have shown that the most important means by which people come to understand, or misunderstand, the world is neither the direct observation of experience, nor analytic understanding, but through exposure to memorable and engaging narratives. Narratives matter both as solutions and problems. Understanding how narratives can be crafted to convey complex new understanding of resource management may be important in building citizen understanding: below I cite their successful use in Botswana. But popular reliance on narratives as sources of information can make people prone to errors. Mullenbath et al. (2006) have highlighted mistakes due to ‘coarse thinking’ whereby a narrative is applied out of context. For example, an old narrative of regional grievance may become co-opted to ‘justify’ a claim for local ownership of a newly discovered resource. Narratives, identities and norms tend to become mutually supporting and so locally stable (Collier, 2015). A major resource discovery may be sufficient to shock these beliefs into a new configuration which then becomes locally stable, albeit dysfunctional.

As a preliminary, Section 2 sets out a simple framework for the public decision process in which citizen beliefs have a clear role. Specifically, I unbundle the public decision process into three components: the promulgation of a rule, the creation of an implementing public institution, and the building of a critical mass of citizens who support both the rule and the institution. I then apply the framework to the two decisions on the assignment of natural resource ownership:

Section 3 considers spatial ownership and Section 4 inter-temporal ownership. In each case I discuss how public policies might effectively counter these psychological biases, drawing on practical examples of success. While the arguments are potentially testable statistically, the main purpose of this paper is to propose that relationships which have not yet been considered are likely to be important. As such the evidence is by way of illustrative examples. I briefly discuss how statistical validation might be implemented in Section 5.

2. Rules, Institutions and a Critical Mass of Citizen Understanding

In basic economic theory a decision is automatically implemented: for example, a household makes a single decision now as to how to allocate a known future stream of money between consumption and savings and this decision once taken is simply implemented day-by-day over time. Whether or not household decisions are like that, public decisions are entirely different. The foundation of legitimate public action is usually a legislative decision: it is no accident that 'legitimate' and 'legislative' have the same root. In respect of the two aspects of natural resource ownership legislation has an obvious role. Several governments have legislated to address the inter-temporal distribution of resource-financed expenditure. The most celebrated case is Norway, where legislation requires oil revenues to accrue to a fund for future generations. Oil can only augment consumption indirectly and sustainably, through a small and prescribed percentage of the accumulated value of this fund. This legislative structure is becoming influential in low-income countries. For example, in 2011 the Ghanaian parliament passed a law requiring 30 percent of oil revenues to go into two funds, one for future generations and the other for medium-term stabilization around fluctuations in the oil price.

Legislation is yet more evidently important to address spatial aspects of ownership. Most governments assign ownership of sub-soil assets to the nation, with revenues accruing to the national government. Others, such as Canada, assign ownership and revenues to sub-national authorities, Nigeria splits them between the federation and the states with a bonus share for the oil-producing states, while in the USA ownership is private. Such legislation is sometimes embedded within the constitution, to give it more permanence.

Legislation is itself a subset of rule-setting. Economic rules can also be promulgated without legislation, through policy announcements of the ministry of finance. Britain during the oil boom of 2003-14 provides examples of policy rules for both temporal and spatial aspects of resource revenues. While minister of finance, Gordon Brown announced that fiscal policy would adhere to a 'golden rule' whereby, over the course of the business cycle (which was to a considerable extent an oil cycle), debt would only be incurred for the accumulation of assets. Similarly, while all British oil revenues accrued to the national treasury, public spending per capita in Scotland, the region in which most of the oil was located, was dramatically increased above that in the rest of the UK as an implicit offset by means of a non-legislated policy rule, the 'Barnet Formula'.

All rules, whether legislative or informal, are only effective if implemented, and this requires action by some public agency. I will refer to the agencies that implement the rules as ‘institutions’. Famously, Douglass North described institutions as ‘the rules of the game’ (North, 1990), but here I reserve the term for a defined group of public officials to whom the rules assign the mandate for implementation, and who over time acquire the budget and the technical capacities necessary to perform the function. So defined, creating well-functioning institutions is considerably more challenging than crafting and adopting appropriate rules. The promulgation of a rule is an event, whereas the functioning of an institution is a continuing process. Because institutions are living entities, a critical issue in whether institutions are shams or realities is whether their staff internalise the intended purpose of the rules. Most rules can easily be flouted by public officials who are so-minded, without behaviour that technically breaches the legislation. There is some evidence that institutions are atypically weak in resource-rich societies (Brunnschweiler and Bulte, 2011; Isham, Woodcock, Pritchett and Busby, 2005), and that resource wealth gradually erodes them (Ross, 2012; Collier and Hoeffler, 2009).

Ghana post-oil and Britain during the oil boom provide clear instances in which the agencies officially mandated to implement rules instead abused their authority by adopting strategies which met the letter of a rule while flouting its intention. The intention of the Ghanaian legislation was evidently that 30 percent of the additional revenues resulting from the extraction of oil would be ring-fenced from consumption. But the implementation of this rule depends not just on how much money is paid into the ‘oil funds’ but on how other revenues continue to be spent. The Ministry of Finance, as implementing agency, had the power to circumvent the rule by increasing the proportion of other revenues that was used for consumption. This it did very aggressively, by borrowing heavily abroad. As an approximation, the government earned \$600m in oil revenues, saved \$200m in foreign funds, and borrowed \$2bn on international bond markets, the bonds being saleable because of the implicit collateral of future oil revenues. The borrowed money was then used to finance additional recurrent expenditures, most notably a 50 percent increase in public sector wages. While the government thereby fulfilled a legal requirement to ‘save’ 30 percent of oil revenues, its true savings rate out of the oil revenues was evidently heavily negative: the new revenues of \$600m had been used to increase net liabilities by around \$1.8bn.

The intention of the British ‘golden rule’ was equally unequivocal. However, the Treasury created scope for flouting it while adhering to the letter through the imprecision involved in the concept of the economic cycle. When the rule was about to be breached, the Treasury changed its measurement of the cycle and when the scope for such manipulation was exhausted, the rule was quietly abandoned. Hence, despite its ostensible intent, it never constrained public consumption.

As these examples illustrate, rules and institutions are insufficient to constrain a government from succumbing to the temptations of excess public consumption, or from conceding to pressure from resource-rich regions for a share of resource revenue greater than that established

by legislation. Rules without institutions to implement them are necessarily impotent, but even those institutions mandated to implement them can be subverted by the pressures of political expediency.

A potential defence against such subversion is for the intention of the rule to be understood and supported by a body of citizens who are collectively sufficiently influential to protect it. I will refer to the minimum size of citizen support needed for such protection as a 'critical mass'. The size which constitutes a 'critical mass' is context-specific and will vary enormously depending upon the actual structure of political power: in some societies it may be as small as the senior cadres of a ruling party, while in others it may be as large as a majority of the electorate.

In a well-functioning system a rule and a critical mass are mutually supportive. The critical mass assists the rule by preventing it being subverted, but equally, the rule assists the critical mass. Being a public event, the promulgation of the rule creates an opportunity to educate citizens as to its rationale. The rule is not just *announced*, but *explained*. Further, the rule generates the associated concept of a rule-breach, and breaches are newsworthy events requiring justification. Rules work by replacing continua with discontinuities. Neither the appropriate rate of savings out of resource revenues, nor the appropriate division of resource ownership between endowed and non-endowed regions, can be precisely derived from scientific or ethical principles. Hence, in the absence of a rule, each could deteriorate through a gradual and unnoticed process of erosion.

Few governments have built a critical mass of citizen understanding on the spatial and temporal assignment of resource ownership. On the contrary, the instinct of governments in resource-rich societies is often to conceal rather than to inform (Egorov, Guriev and Sonin, 2009; Williams, 2011).

3. Spatial Ownership and the Scope for Conflict

Understanding the problem:

How should the spatial ownership of natural resources be assigned? Unlike produced assets, they are not generated by human activity. Whereas the former have a 'natural' first owner, namely the legal entity that produced them, natural resources have no 'natural' owner. Ownership of sub-soil assets could be assigned using at least three different criteria. Rights could accrue to whoever discovers them, as in 'finders, keepers'; or to the owner of the land beneath which they lie; or to the political authority in which the resource is located. However, in this last case, there remains an important choice as to the spatial level of authority, from local community, through district and province to nation.

In the absence of a natural assignment, the pertinent criteria are efficiency and equity. Assignment to the discoverer maximizes the incentive for search. While this might appear to maximise efficiency, it leads to excessive search expenditures in which the economic rents potentially generated by natural resources are dissipated by competitive rent-seeking (Krueger,

1974; Baland, and Francois, 2000; Boschini, Pettersson and Roine, 2007; Torvik, 2002). While the original rent-seeking literature envisaged the activity as political lobbying, the analysis extends directly to resource prospecting. In all the other assignments of ownership, the prospector is provided with an economic return, leaving the rents to accrue to the owner, and so each of them is potentially consistent with efficiency. However, they differ considerably on the criterion of equity. Evidently, the larger the spatial entity to which rights are assigned, the more widely is the ownership of the rents spread. Hence, national ownership is necessarily more equitable than sub-national ownership.

While assigning ownership to the nation is both efficient and equitable, its political acceptability varies considerably, and this is where psychology can provide useful insights. First, following Haidt (2012), people adjust their moral values so as to conform to their self-interest, while not recognizing that they are doing so. This has an important implication for the assignment of ownership over natural resources. Evidently, once the location of a sub-soil asset is known, the self-interest of individuals diverges: those close to the resource have an interest in assigning the rights to the locality, whereas those distant from it have an interest in assigning the rights to the nation. However, what is not evident is that these objectively conflicting interests become imbued with normative force. The title of Haidt's book, 'The Righteous Mind,' conveys the crucial result that the different parties to the conflict come to see their beliefs as *righteous*, not merely advantageous. The endogeneity of norms is compounded by the endogeneity of identity (Alerlof and Kranton, 2011). A local resource discovery increases the salience of local identity. Norms and identities compound conflicts of interest with genuine passion.

One example is the recent discovery of gas off the coast of the Mtwara region of Tanzania. Within a year the local population rioted using the slogan 'Its Mtwara's gas.' Four people died in these riots, showing a level of commitment beyond that implied by rationality. A more remarkable example is Scotland. Once oil was discovered off the coast of Scotland in 1966, the Scottish Nationalist Party (SNP) swiftly adopted as its main political message the proposition that the oil belonged only to Scotland. Whether a proposition is adopted depends not just upon its content but upon its style. Following (Zak, 2014), a proposition should be phrased in a form that is readily memorable. People remember stories involving a person with whom they can identify and who is engaged in a struggle. The SNP brilliantly incorporated these features into a new political slogan 'Its Scotland's oil,' which it has repeated ever since. It combined this with a poster campaign showing an evidently poor, harassed woman, above the message 'It's her oil'. At the time of the discovery the SNP had so little support that it did not have a single Member of Parliament: it now runs the Scottish Government and has 56 of the 59 Scottish seats at Westminster. However, the remarkable rise in electoral support for the SNP cannot readily be accounted for in terms of rational self-interest. Public expenditure per capita has been heavily skewed in favour of Scotland by the 'Barnett Formula', so that while Independence would notionally capture all the oil revenues, it would be more than offset by the loss of the disproportionate share in public expenditure. Rather, it illustrates a psychological proposition of

Akerlof and Kranton (2011) that norms and identities are inter-dependent. As Sen (2006) argues, it is normal for people to hold multiple identities. Consistent with this, prior to the normative proposition 'Its Scotland's oil', few Scots saw any difficulty in holding both Scottish and British identities. However, the proposition introduced a new tension: the ownership of the oil could be assigned to Britain or to Scotland but not both. People who accepted the proposition that oil was Scottish and so not British, should logically conclude that their own identity was Scottish but not British. By 2014 45 percent of Scots took this view.

An implication of these psychological biases is that the discovery of a valuable sub-soil asset is liable to generate not just conflicts of material self-interest, but far more powerful conflicts of identity which are then compounded by perceptions of moral righteousness. This may be why resource discoveries sometimes generate conflicts that are far more costly than the resource is worth. Rational choice economics can also potentially account for such an outcome through the 'voracity effect' (Lane and Tornell, 1999). However, there need be no embarrassment for social science in suggesting that both rational and non-rational processes might reinforce each other in generating dysfunctional outcomes.

Possible solutions:

Given these psychological biases, how might government counter them so as to be able to implement socially desirable policy? Evidently, the most equitable spatial assignment of ownership is nationwide. Can this be accepted as legitimate given the bias towards self-interest? An approach which proved to be effective was that of President Khama of Botswana. Crucially, he recognized that the most opportune moment to gain acceptance of the principle of nationwide ownership was prior to prospecting. Geological ignorance actualized the concept of decision taking 'behind the veil of ignorance' which Rawls proposed as a condition for social justice (Rawls, 1975). Normally, the 'veil of ignorance' has to be conjured up as a hypothetical mental exercise in which people imagine that they do not yet know their place in society. But for the assignment of ownership rights over natural resources, the brief moment between the decision to prospect and the generation of geological information can be used to force an answer to urgent practical question of who should own whatever is discovered. Khama used this moment to consult all the clan leaders. He advocated nationwide ownership, explaining that while it was likely that parts of Botswana would turn out to have diamonds since neighbouring countries had them, each individual clan might or might not turn out to be fortunate. Faced with this prospect, the clan leaders recognized the advantage of equal sharing and so this ownership was legally assigned to the nation. Prospecting for diamonds subsequently revealed a highly uneven pattern of geographic dispersion, but despite this the initial acceptance of nationwide sharing has proved to be robust. In Britain, the rights to oil were assigned by parliament in 1964, prior to prospecting. Without dissent they were assigned to the nation as a whole, rather than to whichever parts might turn out to be well-endowed. However, this was done without any public national debate. Further, no attempt was made at its inception or subsequently to counter the narrative of the SNP, despite the evident scope for making it look unreasonable (Collier, 2014a).

While the approach of reaching agreement prior to discovery proved effective in Botswana, it is unlikely that this is general. Prior agreement may well be a necessary condition for avoiding the biased morality of self-interest, but it is unlikely to be sufficient. Legitimacy is likely to depend also upon the spatial structure of identities prior to discovery. Botswana was unusual in Africa in not having significant fractures of identity arising from ethnicity or religion. In those societies characterized by deep fractures, it may be more prudent to recognize that the most equitable solution of nationwide sharing is liable to generate grievance in well-endowed regions regardless of prior actions. This may be compounded if there is a lack of trust in authority, so that the integrity of agreements which are genuinely reached *ex ante*, may, *ex post*, be condemned as invalid because of imagined secret prior geological knowledge. For example, in Canada some regional identities are far stronger than national identity and so the assignment of ownership of natural resources to the regions may be a prudent recognition of the limits of national authority. Similarly, following a civil war triggered by the attempted secession of the oil-rich region, Nigeria has adopted a formula in which national equity is modified by a premium for oil-rich states. Despite this, a sense of injustice is far stronger in the oil-rich region, based on a perception that it is being plundered by the rest of the country, than that in the non-oil regions, based on a sense that the former are inordinately privileged.

While resource discoveries can fracture shared identity, as in the United Kingdom, if it is not already strong at the time of resource discovery it would be a daunting task to build it post-discovery. Shared identity can gradually be built: a well-researched example is the effectiveness of the strategy for creating national identity undertaken by President Nyerere of Tanzania (Miguel, 2003). However, as the case of Scotland illustrates, any attempt *ex post* of discovery to build a sense of common national identity must contend with the centrifugal force of self-interest which will be weakening it. Hence, it may be more realistic to adopt an assignment of ownership which reflects the prevailing structure of identities, rather than to impose equity across people who do not, and will not, regard each other as legitimate fellow-participants in risk-pooling.

4. Inter-temporal Assignment of Resource Revenues

Understanding the problem:

Since revenues arising from the depletion of a non-renewable resource are unsustainable, there is an analytically and ethically powerful case for devoting a substantial proportion of them to assets. Van der Ploeg and Venables (2011) apply a standard Utilitarian framework of inter-temporal optimization to resource depletion with the implied rates of saving and investment out of resource revenues being far higher than what has typically been done. Alternatively, the assignment of ownership can be based on principles of respect for the distinctive rights that future generations have over inherited natural assets of which the current generation is a custodian (Collier, 2010). This approach also implies that actual consumption out of resource revenues is excessive.

Citizen pressure for excessive consumption can arise from several distinct biases. One is a bias towards exaggeration of the likely revenues. Such an exaggeration of revenues may be particularly severe with oil discoveries. As discussed above, people understand the world primarily through memorable personalized narratives. The potential benefits of an oil discovery are liable to be inappropriately influenced by 'coarse thinking' such as high-profile narratives of oil-derived opulence derived from images of the Gulf States. Exaggerated expectations may also result from a bias towards optimism in forecasting. A well-researched example of this bias is the planning of mega-projects (Kahneman, 2011). The passage from discovery to exploitation is analogous to a mega-project, being complex and having many layers of uncertainty. The bias arises because plans which chart optimal paths inadvertently become the baseline rather than best-case scenarios. Given the myriad of complexities, unknowns and uncontrollable factors involved in all such projects, there is typically a large gap between best-case and actual outcomes. For example, the average period of execution assumed in plans is less than a third of the time actually required.

A further reason for excessive optimism by citizens is a commercial bias in the dissemination of information about discoveries. During the past decade, the commercial structure of prospecting has changed so that in politically stressed countries it is undertaken predominantly by small and relatively new companies that depend upon financing from speculative investors, predominantly on the Toronto and AIMS stock markets. In consequence, such companies find it advantageous to exaggerate the potential of discoveries, subject to the modest constraints imposed by regulatory scrutiny. For example, a company prospecting for oil will typically announce the possible number of barrels in a discovery well prior to any assessment of whether it is commercially viable. Further, the information reported is the gross physical amount and its valuation at world prices. For people living on the edge of poverty, these are mesmerizingly large numbers.

Even once the discovery phase is over there may be further pressures from citizens for excessive consumption. One common circumstance is a lack of trust in government (which may or may not be well-founded), in conjunction with an asymmetry in information whereby people can observe their own consumption more readily than public investments. A political decision to use new resource revenues to increase investment is therefore liable to defer the delivery of visible benefits. Voters would be able to observe the lack of extra consumption more readily than the increase in investment. Since voters suspect that politicians will embezzle resource revenues for their own advantage instead of using them for the public good, they are liable to misinterpret the deferral of consumption as elite looting of revenues. Voter suspicion of government thus drives politicians to delivering consumption rather than investment. This is a variant on the electoral budget cycle (Blais and Nadeau, 1992; Khemani, 2004).

A further reason for citizen pressure for excessive consumption is because in poor countries citizens are liable to be stressed by poverty. Mulleinathan and Shafir (2013) establish that the

stress of poverty generates a systematic deterioration in the quality of decisions, including an excessively high discounting of the future.

These biases towards consumption are compounded by the cyclical nature of commodity prices. In addition to the need to offset resource depletion through the accumulation of other assets, substantial revenues need to be saved during periods of high prices in order to smooth spending during periods of low prices. If, instead, governments are forced by electoral pressure to spend boom period revenues, once prices decline they are faced with the need for spending cuts. Because cuts inevitably single out an identified group as being due to lose, the political opposition to them is easy to organize, and will be reinforced by a sense of moral righteousness due to the tendency, discussed above, for people to adjust their values to their self-interest. As a result, governments may decide that during periods of low prices it is politically less costly to cut unobservable expenditures on investment. Over time, this can produce a consumption ratchet: during boom periods consumption rises excessively, but in slumps the burden of retrenchment is placed predominantly on investment. Ghana since the discovery of oil has exemplified this pattern. Faced with intense political competition, between the discovery in 2007 and the onset of extraction in 2011 the government responded to the pressure of exaggerated expectations by borrowing commercially on the international bond market, using the proceeds predominantly for consumption. Following a change of government, in the brief period since extraction began there has been a further increase in public consumption beyond revenues, culminating to a fiscal deficit of ten percent of GDP. Faced with a sliding currency and the evident need to reduce recurrent expenditure, during 2014 the government borrowed a further \$1bn on commercial terms. Both in Ghana, and in the similarly tightly contested politics of Zambia, by the end of 2014 an emergency IMF program was necessary.

Finally, the exaggerated expectations and the distrust interact. People expect more than can be delivered, even though new revenues have been devoted to consumption. This is even a problem in mature democracies, (Kimball and Paterson, 1997; Waterman *et al.* 1999), so in new democracies with electorates suspicious because of their experience of autocrats, it is likely to be acute. Due to their mistrust, rather than recognizing that their expectations were exaggerated, voters will be inclined to misinterpret the gap between expectations and delivery as indicating that the political elite has misappropriated revenues for its own advantage. Thus, the two errors are jointly consistent with information that voters can observe, and so the mental model is reinforced. An important example of this process was the attempt by the reforming Nigerian Finance Minister, Ngozi Nkonjo-Iweala, to eliminate the highly distorting and corruption-prone petrol subsidy so as to switch public spending to investment. The response was a sustained mass national protest that forced policy reversal. Instead of recognizing the removal of the fuel subsidy for what it was, the policy was overwhelmingly misinterpreted as indicative that the political elite were becoming yet more rapacious, reducing public spending on something that assisted mass consumption, in favour of projects that could more readily be looted.

Governments respond rationally to these citizen pressures (Collier and Venables, 2011; Bhattacharyya and Collier, 2013). By skewing spending towards current consumption governments tend to prolong their period in power (Andersen and Aslaksen, 2013; Cuaresma, Oberhofer and Raschky, 2010; Ross, 2001).

Possible solutions:

On the above analysis, the bias towards excessive consumption is in part rooted in mistrust of government. Solutions must therefore address this problem. Citizens must be able to trust that resource revenues not visibly used for mass consumption are being deployed for assets rather than being captured by the elite.

One solution to the need for trust is for the political elite to use personal lifestyles as an observable signal of type. Specifically, by adopting a collective norm of personal self-sacrifice leaders are more likely to convince citizens that their own sacrifices will be for the future rather than for their leaders. Examples of such leadership norms are Meles in Ethiopia and Nyerere in Tanzania. Both made statements through their visible lifestyles. Meles continued to dress in a humble fashion, eschewed formality, and adopted a lifestyle little different from that of the soldiers who guarded him. Nyerere also avoided the standard visual images of the 'big man', choosing to live in a house rather than the mansion bequeathed by the previous colonial governor. Both were able to implement severe restraint in national consumption in order to implement a 'big push' strategy on public investment without arousing incapacitating opposition. Nyerere's strategy, implemented during the period 1974-84, was to prioritize investment in industrialization, an approach typical of socialist regimes of the time. As Tanzania's terms of trade deteriorated, this required increasingly acute rationing of consumption. The strategy failed for a variety of reasons, but the ability to persist with it was politically remarkable. Similarly, from around 2005, the Ethiopian Government steadily raised the share of public investment in GDP, with particular priority to electricity generation, financing it through increasingly severe financial repression.

Another solution is to create a credible commitment mechanism whereby a substantial part of natural resource revenues can only be used for investment. The challenge here is evidently to create a system which is credible. Some African governments have done this through contracts with extraction companies in which in lieu of revenue the country receives specified and high-visibility infrastructure such as a railway. This has been a hallmark of the Chinese approach to resource extraction in poor countries, but it has wider application. For example, the contract ratified between the Government of Guinea and Rio Tinto in 2014 for the development of the Simandou iron ore mine essentially traded off some tax revenues in return for the construction of a national railway to be designed for multiple use by third parties. The construction of the railway is a process readily observable by citizens. Further, since it is a project that is far too costly to have been financed by the government from other sources, there is no possibility of

fungibility: the project cannot free up government revenues for consumption that would otherwise have been used to pay for it.

A further solution is to build in tandem an independent implementing institution and a critical mass of citizens who understand its purpose and function and therefore defend it. Potentially, this can be done either by domestic political leadership or international pressure. Liberia and Botswana provide practical examples of the challenge and how it might be tackled.

In 2012 Exxon paid the Government of Liberia a signature bonus of \$50m for prospecting rights for offshore oil. The strike rate for oil prospecting is around one commercial find for every nine wells drilled, and having drilled one dry well and will the price of oil much lower than expected, Exxon appears disinclined to explore further in Liberian waters. Hence, the signature bonus currently appears likely to be the only money the country receives. Yet the report of \$50m hit citizen expectations like a shock wave. How might the search for oil have been better communicated? The signature bonus might more appropriately have been announced as an amount per capita, the amount being only \$12. This would have bounded expectations of a consumption bonanza. The news of the payment might have been accompanied by the crucial information that the chance of success was only around one-in-nine. This, in turn, could have been used to build a narrative of the form 'we won't count our chickens before they're hatched'. Since Liberia is a highly religious society, a narrative of good stewardship of revenues for the benefit of the next generation could have been spread through the network of churches and mosques. It could have been presented to people as a religious duty using, for example, the parable of the talents in the Gospel of St Luke.

Whereas communication concerning Liberian oil prospecting was not handled well, Botswana's management of communications concerning diamonds is entirely different. President Khama not only successfully addressed the issue of ownership, but achieved good stewardship of diamond revenues through adept domestic political leadership. The rules and institutions created to implement asset accumulation were unremarkable: a balanced budget rule, and a sovereign wealth fund, (the Pula Fund). These could readily have been subverted had parliament and the Ministry of Finance wished to do so. Perhaps more distinctive was the sustained message from President Khama and his successors countering inflated expectations and explaining the case for investment. This was encapsulated in the slogan 'We're poor and so we have to carry a heavy load.' As with the equally successful messages of the SNP, this was easy to memorize because it engaged ordinary citizens in a sense of personal struggle, and from this internalized perspective led them through to the conclusion that, as in other aspects of their difficult lives, turning diamonds into a better future would require patience. The prescience of this seemingly trivial utterance is best gauged by the alternative narrative that became widely circulated in the Mtwara region of Tanzania following the discovery of offshore gas: 'We're rich; we don't have to work anymore', a narrative that is also highly memorable, superficially plausible, and generates a supremely attractive inference. In effect, that second narrative is the default option that is likely to set in following a resource discovery unless actively countered by an incompatible narrative.

that thereby pre-empts it. Khama's narrative brilliantly achieved this: people were still poor, not newly rich, and far from not needing to work they would have to continue to work hard for a long time in order to climb out of poverty. Having built the case for deferring consumption, Khama maintained trust by living modestly and ensuring that elite corruption was unacceptable, thereby creating the basis for popular acceptance of the Pula Fund strategy.

Finally, a critical mass of citizen understanding might also be built through international action. The international community has already put significant effort into improving citizen information about natural resource revenues, through the Extractive Industries Transparency Initiative. But the focus of this effort has, quite reasonably, been to get disaggregated information so as to counter corruption. Were international action to be expanded so as to counter exaggerated expectations, the most appropriate organization would be IMF. It could provide standardized internationally comparable aggregated information on the magnitude of resource revenues. However, the present format of IMF information is so far removed from memorable narratives that it is unlikely to contribute directly to the formation of a critical mass of informed citizens. Evidently, the IMF cannot itself craft slogans, but it could at least package information that could be more readily used by local politicians for repackaging. The conventional reports of the physical volume of a discovery, its gross valuation, and the total annual revenues to government all involve figures in millions or billions which resonate with citizens all too well, being misinterpreted as implying vast wealth. A more appropriate format would be to present annual public revenues per capita, combined with their likely duration based on known reserves. To impose discipline on agencies tasked with implementing savings strategies, the IMF could present its best estimate of how revenues are assigned between consumption and assets. In this role it would be analogous to an independent office of budgetary responsibility, tasked with commenting on government decisions. The estimate would necessarily require the specification of a counterfactual, but this need not be particularly controversial. For example, simply using the average assignment for the years preceding a resource discovery would be difficult to challenge as long as it was adopted as standard, being applied to all countries.

5. From Examples to Validation

In Section 3 I suggested that how citizens assign the ownership of natural resources depends upon norms and identities which are influenced by both self-interest and politically generated narratives. In Britain the narrative of the Scottish Nationalist Party, 'it's Scotland's oil' gained salience, whereas in Botswana the opposite narrative of President Khama, 'wherever it's found it belongs to all of us', became salient. I have suggested that in the absence of an active communications strategy such as that of President Khama, undertaken behind the veil of geological ignorance, self-serving norms such as that of the SNP are liable to be the default option and thereby introduce potentially serious conflicts into a society.

In Section 4 I suggested that how citizens assign the benefits of unsustainable revenues from resource exploitation between consumption and assets depends upon beliefs. If people believe a narrative such as ‘the government will steal our money’ they will pressure for visible consumption and punish a government that used revenues for less visible assets. If people adopt decision rules of thumb such as ‘a bird in the hand is worth two in the bush’, they will discount the future more heavily. If they are subject to ‘coarse thinking’, conflating an oil discovery with the prospective lifestyle of an oil sheik, their expectations of government will be exaggerated.

Such examples can illustrate a hypothesis but not establish it. The propositions of this paper are in principle empirically testable because identities, norms and narratives are observable beliefs. They can be quantified through responses to surveys, and revealed through participation in experimental games, the two approaches being complementary since they have different limitations. If suitable natural experiments can be found, these techniques can potentially establish whether beliefs are altered by natural resources. Alternatively, the effect of a natural resource discovery might be simulated in laboratory style field experiments.

However, prior to such quantification, a sensible stage would be to build case studies which applied the approach to specific situations. It should be possible to determine to a reasonable degree of confidence whether changes in beliefs following a resource discovery played an important role in either generating conflict or encouraging populism, and whether government communications strategies countered or exacerbated any such tendencies.

6. Conclusion

Natural resource discoveries are opportunities for poor societies to accelerate development through their own resources. Often, however, the opportunities are missed. Conventional accounts of this resource curse attribute it to the divergence between the interests of citizens and the self-interest of government decision takers. The policy inference has been the need for greater accountability of government to citizens, assisted by transparency.

In this paper I have focused upon only two aspects of the resource curse: disputed spatial assignment of ownership can become a source of conflict; and revenues can be excessively devoted to consumption. The literature on the resource curse conventionally analyzes these problems in terms of the rational self-interest of government actors. Without challenging these accounts as partial explanations, I have proposed additional explanations in terms of pressures from citizens that can drive democratic governments into dysfunctional choices. To the extent that this is correct it deepens the resource curse: the solution is no longer cast as making government accountable to citizens, but as countering citizen misunderstandings so that accountability helps rather than hinders good government.

I have suggested that good resource management is helped by prior investment in a specific tripod of a critical mass of informed citizens who support the rules and institutions which guide and implement decisions. The need for rules is well understood: they provide guidelines for

repeat decisions such as savings and investment. Institutions are needed to implement the rules: they consist of teams with appropriate mandates and capacities. It is straightforward to create institutions that mimic ones that function properly, but difficult to build ones that are effective and protected from being subverted. The defence of rules and institutions is the core task of informed citizens. To be adequately informed in respect of natural resource management, citizens must internalize two propositions: that the structure of resource ownership is legitimate, and that revenues should substantially be used for the accumulation of assets. Building a critical mass of such citizens is difficult and little serious analysis has yet been devoted to how it might be done. Drawing on recent developments in social psychology and behavioural economics the paper has attempted to make a start on this agenda.

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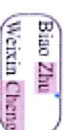
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