The Mineral Resource Curse in Africa:

What Role Does Majority State Ownership Play?

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Developing nations have long sought sources of revenue to finance their economic development. With the end of World War II, and the relatively quick return to prosperity of war-torn Western Europe, development economists held that capital constituted the missing ingredient for third world development. Although most developing countries have struggled to obtain such capital from their agricultural or industrial sectors, a handful of countries were apparently blessed with easy access to investment capital: those with mineral or oil exporting sectors. It was thought, until recently, that these lucky countries could translate their natural mineral resources into sufficient capital to meet their developmental goals.

In contrast to these early high hopes, scholars recently noticed that countries endowed with natural resources, especially mineral resources, underperformed economically when compared to other similar countries. Instead of higher growth and more development resulting from mineral sectors, these countries accumulated high levels of debt while experiencing slow, or even negative, growth rates. Known today as the "resource curse," or the "mineral resource curse," low growth is but the most common negative economic outcome associated with these sectors. Other resource curse outcomes include low income, non-diversified economies, authoritarian rule, and increased levels of conflict.

One potentially understudied aspect of the mineral resource curse is that these sectors in the third world tend to be wholly, or majority, state owned. State ownership – particularly *majority* state ownership of these sectors – may be an important factor relating to the negative economic and political outcomes associated with the resource curse. Majority state ownership occurs when the government has more than 50% ownership. This amount of ownership allows the government to "win" any issue being contested by the board as voting (usually) is tied to stock ownership. This paper holds that majority state ownership of a country's major mineral or oil export sectors can greatly exacerbate the economic and political difficulties associated with mineral abundant economies as political elites manage these sector for short-term political goals, often at the direct expense of long-term economic ones.

Literature

The resources curse literature rests primarily upon a well-established empirical foundation, linking relatively poor economic performance to countries with an abundance of natural resources (Auty, 2001a; Auty, 2001b; Sachs and Warner, 1997, 1995). The central finding is that countries with an abundance of natural resources experience lower growth rates relative to other similar countries (Stevens, 2003; Auty, 2001a; Auty, 2001b; Sachs and Warner, 1997, 1995; Ross, 1999). This is particularly so when countries are major exporters of either mineral or oil resources (Stevens, 2003; Auty, 2001a; Auty, 2001b; Sachs and Warner, 1997, 1995; Ross, 1999; Karl 1999).[1] The second major outcome associated with the resource curse is similar: these countries have had lower per capita incomes over time (Bulte, Damania, & Deacon, 2005; Sachs and Warner, 1997, 1995). Negative outcomes in several other measures of human welfare have also been linked to natural resource wealth (Deacon, 2003; Bulte, Damania, & Deacon, 2005).

Third, these countries experienced higher levels of debt than did other, similar countries (Manzano and Rigobon, 2001). Fourth, mineral- or oil-resource rich countries, in particular, tend to over-concentrate developmental investment capital into their export sector, thus leading to less diversified economies (Stevens 2003, Ross 1999; Karl 1997). Such countries tended not to industrialize (or invest in efficient industrialization) or to deepen their traditional agricultural export sectors (Stevens, 2003; de Ferranti et al., 2002). These linked outcomes are often referred to as the "Dutch Disease."

Fifth, countries with natural resource endowments often have higher levels of domestic and regional conflict (Murshed, 2004; DeSoysa and Neumayer, 2005). Mineral resource abundance, especially point-source resources, provides easily captured sources of financing for civil wars, rebel coup attempts, competition among warlords, as well as general looting and violence (Stevens, 2003; Collier and Hoeffler, 2000; Lujala, Gleditsch, and Gilmore, 2005, p3; Ross 2004). Once begun, escalating domestic conflicts can lead to external conflict through diffusion effects (Lobell and Mauceri, 2004).

Finally, mineral- or oil-rich countries have been more likely to feature authoritarian political systems (Wantchekon, 1999; Jensen and Wantchekon, 2003; Stevens, 2003; Auty, 2001a; Herb, 2003). Auty suggests the high prevalence of authoritarian regimes is in reality retarded political change – thus slowing progress towards democracy in third-world countries (2001a; Stevens, 2003).

Majority State Ownership

We offer an understudied structural variable to explain part of these outcomes: majority state ownership. In fact, many countries used to illustrate the mineral resource curse feature majority state ownership: Zaire (now DRC), Nigeria, Venezuela, Iraq, Mexico, and Zambia (Shafer, World Bank 1989, Krasner 1985, Tangri 1999). In addition, the timber concessions that were at the heart of Ross' 2001(b) study were majority state owned.[2] Moreover, many other prominent oil and mineral producers have majority or 100% state ownership of these sectors – as do all OPEC countries. In mining, Zaire, Chile, Zambia, and Ghana nationalized their major mineral exporting sectors in the 1960s and 1970s (Krasner 1985; Rood 1976). These nationalizations were seen as a remedy for past colonial injustices, dependency thinking, socialist planning, or just plain economic nationalism (Tangri 1999, Krasner 1985, 1978; Rood 1976; Kennedy 1988; Quinn 2002). In sub-Saharan Africa, countries as diverse as Angola, Nigeria, Zaire (DRC), Zambia, Ghana, and Togo all nationalized their mining or oil sectors not long after gaining independence (Tangri, 1999; Kennedy 1988). Only a few countries with significant oil or mineral exporting sectors did not have majority state ownership of oil or mineral exporting sectors: Botswana, Cameroon, and Gabon.[3] These countries usually only began exploiting high levels of mineral or oil during the post-independence period.

Others have indicated that majority state ownership might be part of developmental problems: the World Bank has long argued that state ownership of productive enterprises is inefficient and wasteful (1981, 1989, 1995). Tangri (1999) argued that state-owned enterprises underperformed economically for several reasons: "inappropriate pricing policies, poor investment decisions, substantial overstaffing, and chronic management problems" (24). On a sector-by-sector basis, Sandbrook (1993) demonstrated that 100% state-owned sectors were the least efficient, followed by majority state-owned ones; then both were outperformed by less than 50% owned companies. Using a state-level analysis, Quinn (2002, 1999) showed that majority state ownership of mineral- or oil-exporting sector **or** of most capital-intensive industries in sub-Saharan Africa resulted in more inward-oriented development policies, which in turn lowered economic returns. This analysis included both cross-sectional, large-N statistics, as well as deep case study comparisons to arrive at these conclusions. Quinn also linked majority state ownership with higher levels of corruption (forthcoming). Weinthal and Jones Luong (2006) have also argued that state ownership of oil in has contributed to mineral resource curse outcomes.[4] Finally, Ross (1999) speculated that that several of the emergent explanations for the curse lend some focus to "state-centered" explanations as well as to the role of parastatals.

We argue that majority state ownership can affect development trajectories in several important ways: 1) its effects on the sector itself; 2) its spillover effects for state-society relations; and 3) its effects on the possible expansion of state-led ISI projects.

Majority State Ownership Effects on the Oil or Mineral Sector Itself

From an institutional perspective, where the state owns over 50% of the stock in a company, the ruling political elite of a country would win every vote concerning they key issues of the management of the mining or oil parastatal: hiring, firing, how much to invest or re-invest, and so forth. With only 50% ownership, the government can wield a veto, and with less than 50%, the host national government would lose any contested vote.[5] Although private minority owners could clearly exit or use other forms of power, the government ownership would translate to winning any contested election/ decision (Hirschman 1970). With increased government control through ownership, the political elite should be able to extract more revenues from these enterprises and to do it less transparently.[6]

From this initial position, one should expect that the political elites in charge of enterprises, who would not be personally compensated for any increases in efficiency, would prefer to maximize power or political support to economic returns. Therefore, the normal rates of economic efficiency should be lower in MSO enterprises. This should be uncontroversial, as many scholars have shown that state-owned sectors or enterprises are less efficient economically than privately owned ones (World Bank, 1981, 1989, 1995; Sandbrook, 1993; Tangri, 1999; Nellis, 1986; Shafer 1983).[7]

The major reasons for the differences in efficiency within state-owned firms are as follows. First, state-owned enterprises are often required to maximize hard-to-measure social goals beyond easily measurable profit-centered ones (World Bank 1981, 1995; Sandbrook 1993; Tangri 1999; Nellis 1986). For example, Tangri suggests that state-owned enterprises face strong pressure to "provide employment and the redistribution of public resources" (1999, 21). Second, Shafer argues that state ownership of mineral sectors in Zaire and Zambia eliminated the political insulation protecting privately owned companies from political demands on "profits" or enterprise revenue streams (1983, 96). Thus, such sectors may have less reinvestment. Moreover, demands coming upon the sector through the political arena may result in the politicization of the entire sector (Shafer, 1983; Tangri 1999; Nellis 1986). In Nigeria, for example, the kidnappings of oil workers for concessions from the oil parastatal have become common, as have protests of Shell Nigeria from the Ogoni people. Moreover, the Nigerian public routinely ruptures pipes to obtain oil for the black market. Since the government owns the sector, it is harder for political elites to blame "the market" for costs arising from the enterprises or to eliminate subsidies. Third, the political elite should prefer to hire political supporters than to fill such positions on pure merit – either as a political reward or to keep an ally in charge of such a valuable resource. Hiring loyal workers instead can exacerbate management problem unique to "weak" states which have a limited number of well trained managers (Diamond 1987). Fourth, the hiring of political supporters can be seen as corruption within any particular sector. In fact, many scholars have argued or shown that (majority) state ownership led to corruption (World Bank 1997, Mbaku 1999) and / or poor governance (World Bank 1989). Fifth, majority state ownership can facilitate the private enrichment of the political elites. With controlling interests, the political elite can fill key positions such as accountants and supervisors, which would facilitate their ability to extract money from the enterprise (Tangri 1999; Quinn 2002) or to raid those state owned enterprises flush with money (Ross 2001b). Sixth, few people would have the narrow self-interest to expose corrupt or inefficient practices within these companies. On the one hand, the management or political elite who are benefiting from these practices do not have the self interest to try to limit them. Therefore, underlings are unlikely to be rewarded for pursuing reforms. On the other hand, whistleblowers, or others attempting to curb corruption, may find themselves with no future in the company, the party, or anywhere in the formal economic sector. Whistleblowers or reformers can face harsh forms of repression or personal reprisals – and the more authoritarian the system, the more likely repression is. Therefore, would-be reformers would have no personal benefits for stopping corruption, though they might gain powerful adversaries and incur high personal costs.[8] Finally, since managers of state enterprises cannot bequeath their control to their heirs, and since they may have this position only as long as they hold favor with the current administration, their time horizons should be shorter than a capital-owning bourgeoisie's would be. Thus, they would be less likely to be good stewards of the long-term interests of the company.[9] In sum, majority state owned firms, especially the ones creating the most wealth in developing countries, are likely to be run to maximize political support and personal enrichment at the expense of long term planning and efficiency.

From the above analysis, we can expect lower growth from this major sector as well as less maintenance from the state-run sector mineral or oil sector. Where jobs and positions for political supporters, as well as for college graduates, are important political and social goals, they are more likely to be included than in privately owned sectors. This sector should be overstaffed and less efficient, have less reinvestment, and be more corrupt than privately owned sectors – ceteris paribus. As this is the primary economic engine of the country, overall growth should be lower.

Majority State Ownership Effects on State-Society Relations

Majority state ownership of the most lucrative sector in the economy would also affect state-society relations. Within African studies, it is widely acknowledged that rents and patronage have been the glue for most one-party or military regimes. Regimes built upon these types of foundations are often called neopatrimonial rule where "the chief executive maintains authority through personal patronage, rather than through ideology or rule of law" (Bratton and van de Walle, 1994, 458). Whether or not scholars use the term neopatrimonial, patrimonial, patronage systems, weakly institutionalized systems, or rent seeking, patronage was seen as the glue many African political systems following independence (Bates 1994, Callaghy 1984, Clapham 1997, Englebert 2000, Joseph 1999, Sandbrook 1993, Tangri 1999, van de Walle 1994, Young 1999).

We argue that countries that countries in sub-Saharan Africa with majority state ownership should be more neopatrimonial than other similar countries, so they should differ by degree and not kind. On the one hand, the governing elites would have more access to economic resources than otherwise, and they can more easily distribute resources outside of a traditional bureaucratic procedure. This should result in increased massive rent seeking and patronage opportunities in the largest revenue producing sector as well as set a tone for other sectors, including government bureaucracies and agencies. This could easily create or deepen a culture of corruption – especially where the political elite are part of a ruling party led by a single individual – which would lead to more corruption (Ali and Isse 2003).

Second, if these political elites have easy access to revenue flows from the mineral or oil sector, then political leaders do not need to create strong institutions in order to bring in investment associated with farming or industry.[10] The transfer of rents from the natural resources could be sufficient for patronage politics. Therefore, there is less need for alternative revenue producing sectors, if the export sector is wealthy enough. This could help explain the negligence of traditional sectors as well as industrial ones beyond any "Dutch disease" effect.

Third, with MSO of the major export sector, the government would have access to an independent revenue stream – divorced from broader social constituents. Therefore, the government would be more autonomous from its own domestic society, as well as from the international community. If the government had to tax privately owned economic sectors, owners of these sectors could make increased demands upon the ruling elite in return for taxes paid. Moreover, an independent business class may fight to limit government revenues which came from them. Or they could demand representation in return for higher taxes. In addition, we should expect private owners to spend at least part of their time and money minimizing the grasping hand of the state, whether from a particular sector or from private industry generally. Where the most important economic sector is majority state owned, the most likely people to try to limit government intrusion into the sector do not exit, or they are in a minority. Managers with different incentive structures would have replaced them. This also undermines democracy, though it limits the creation of a group with active interests in holding government economic action accountable.

Fourth, the effect of majority state ownership of the dominant export sector should bolster, deepen or support neo-patrimonial tendencies in a society (see above). Neopatrimonial regimes are defined as ones in which the distinction between public resources and private resources is conflated or collapsed, allowing leaders and politicians use state-owned sectors for political support or personal enrichment. Although privately owned oil companies could provide funds for patronage through taxation, one should think that direct majority ownership would increase the opportunities for politicians to use this sector for patronage purposes; fewer institutional restrains for restricting political access to economic revenues exist (Collier 1999). Moreover, with a majority vote on the corporate board of the local affiliate, the ability of politicians to either raid revenues or put their people in well-positioned offices is greatly increased. In fact, Shafer argues that state ownership of such sectors (in Zaire and Zambia) eliminated the political insulation which allows privately owned companies more shelter from political demands (1983, 96). This neopatrimonialism can also lead to lower growth as state-owned enterprises tend to become giant consumers of domestic credit without creating a strong return (Tangri 1999; Nellis, 1986). Thus, these countries should experience lower levels of growth as investments are inefficient (World Bank 1981).

Fifth, if change in state-society relations takes place in the dominant sectors of the economy, as well as to other aspects of the economy, it could undermine the emergence or maintenance of democracy. Quinn (1999, 1993) showed that prior to 1986 countries with majority state ownership of industry or mining were less likely to have multi-party democracies. The logic is that countries with majority state ownership have or create new incentive structures that help undermine the conditions for democracy. Many scholars have shown that democracy requires a business class or bourgeoisie (Moore, 1966; Lindblom, 1977; Przeworski, 1991). When the state owns the dominant sectors of the economy, they not only displace a bourgeoisie, they also remove their dependence upon them for taxation or support (Anderson, 1974; Ross, 2001a; Weinthal and Luong Jones 2006).

Finally, majority state ownership of minerals or oil sectors can be linked to state-society relations through increased civil or intra-state violence. If control over the economic resources of state-owned companies goes with winning an election, then elections would become zero sum: Winning political elections by even a small percentage would result in nearly complete control over both political and economic resources in the country. Moreover, acquisition of significant wealth becomes feasible only through control of state levers. Therefore, gaining access to political office is required to obtain significant economic assets. If the state also owns all or most capital-intensive industries, then they control most modern, non-agricultural sectors jobs – and patronage is dispensed to the supporters of the winners, not to the followers of the losers. As such, winning elections means capturing the economic high ground as well as the political high ground. Under these conditions, incentives are to win at all costs. Winning at all costs could mean rigging elections, banning opposition parties, buying off opponents, or engaging in violence to capture political gains, which would translate into economic ones (Hodder-Williams, 1984; Quinn 1999). These stresses can easily result in violence over control of such scarce resources.

From the above analysis, we would argue that majority state ownership of mineral or oil resources would predict, all other things equal, that there would be lower levels of government productivity, lower growth from these sectors (and therefore lower growth for the economy as a whole), less democracy, and more internal conflict.

Hypothesis:

We test the proposition that significant mineral or oil exporting countries in sub-Saharan Africa and in which the government owns more than 50% of this sector they will often exhibit far more extreme symptoms usually associated the mineral curse. By contrast, the mineral or oil exporting countries without majority state ownership of such sectors will have lower, or less severe, levels of the same symptoms of the resource curse. This is not to suggest both categories will not suffer from the mineral resource curse, just that we intend to show a significant difference in degree, as no control for non-mineral or oil-exporting countries are included.

Case Selection, Operationalization, and Period of Study

In order to test the impact of majority state ownership (MSO) on mineral or oil economies, our study employs a most-similar design with six countries from sub-Saharan Africa. In our sample, we include countries where either mineral or oil exports dominate the cases' export sectors. However, only half of these countries feature majority state ownership of their mineral export sector. This selection controls for many of the traditional rival explanations for both poor economic performance and low levels of democracy: being in Africa, dependency, past colonization, low levels of literacy, low levels of development, low institutional capacity, low levels of legitimacy, low level of state capacity, and, of course, primary mineral or oil exporting.[11]

We include six mineral or oil exporting countries from sub-Saharan Africa. The three countries having majority state ownership are Angola, Nigeria, and Zambia.[12] The three countries without majority state ownership are Botswana, Cameroon, and Gabon. For further clarification, Angola, Nigeria, Cameroon, and Gabon are oil exporters. Zambia is a major copper exporter; and, though Botswana also exports copper, it is primarily a diamond exporter. The match features two major oil exporters in each camp as well as one major mineral exporter in each camp.

The period under study is 1966 – 2000, though we have different starting points for different countries. Each country is included for the year in which it becomes a major mineral or oil exporter, but only after it had gained independence. We chose the earliest start date as 1966 as some of our countries were free of colonial rule by then, and the end data of 2000 is the last available date in Penn World Tables.[13] Therefore, we have a longitudinal element to the most similar design. If the country was a major oil or mineral exporter prior to nationalization, it was included as data for non-MSO.

The presence of majority state ownership of a major oil or mineral exporting sector represents the independent variable. We include the country beginning with the year that it became a major mineral or oil exporter. We also show when and if the country had majority state ownership. The dependent variable is comprised of several competing measures of the negative policy and economic outcomes associated with the resource curse. The dependent variables in our study include these variables: (1)

levels of growth (2) levels of incomes, (3) levels of debt, (4) levels of diversification of the economy, (5) levels of currency appreciation, (6) levels of democracy, and (7) levels of conflict. Each one is averaged by category of country: one average for countries with majority state ownership of this sector and one average for the others. Countries with significant oil or mineral exports are included from the date of such exports, whether or not they later come into majority state ownership or not. To remind the reader, the hypothesis is that countries with majority state ownership of their mineral or oil export sectors will experience higher (or worse) levels of the variables associated with the resource curse. We also add two other variables: currency overvaluation and investment. Since state ownership was supposed to be a cure for foreign ownership of economic sectors and to increase investment, including this variable is common sense. Currency overvaluation is a measure of policy distortion, which is something that many have considered a problem throughout sub-Saharan Africa. The direct effect of currency overvaluation is a tax on exporters and a subsidy for importers (Bates, 1981; World Bank, 1989).

The data for these variables come from a variety of sources. The variables for growth and income are derived from Penn World Tables 6.1, GDP per capita in current 1996 dollars (chain). Growth is measured by a percentage change of this variable. Debt comes from the 2002 World Bank Africa Database CDROM (WBAD, 2002). We use the variable: "total external debt to GDP ratio." Diversification of the economy comes from "Value Added in Manufacturing" and "Agricultural Exports" from the 2002 World Bank Africa Database CDROM (WBAD, 2002). Both are reported as constant 1995 dollars as well as changed into percent change to control for size. Implicitly, as either value added in manufacturing or agricultural exports weaken, then the country is more dependent upon mineral exports. We also include the variable of currency overvaluation since this policy is often linked with decreased exports of other non-mineral sectors that are more responsive to price. Currency overvaluation here is the ratio of unofficial exchange rates to official exchange rates, and it is found in the 2002 World Bank African Database (WBAD, 2002).[14] The variable of currency appreciation/ depreciation is measured twice, once from official exchange rates and once from unofficial exchange rates. The official ones come from the 2002 World Bank African Database, local currency/ $ US. The unofficial one is the percent change of the unofficial exchange rate, where appreciation is the positive number and depreciation is negative.[15] The variable for investment comes from Penn World Tables 6.1, investment in current dollars, and it represents the measure of investment's share of GDP; lower values represent lower levels of investment. The variable "democracy" is taken from values of the Polity IV dataset wherein regime types are valued from -10 to +10 on an autocracy-democracy continuum; lower values indicate that more authoritarian practices are instituted, or non-democracy, which is a highlighted symptom of the resource curse (Jaggers and Gurr, 2005). The "domestic conflict" variable comes from the Correlates of War Project's web page for their Militarized Interstate Dispute data series. The external conflict variables (MID and FUVF) represent propensities for conflict. The Militarized Interstate Dispute (MID) data is taken from the Correlates of War Project web data series, while the First Use of Violent Force (FUVF) dataset is hosted by the University of Maryland (Sarkees, 2000; Caprioli and Trumbore, 2003).

Majority State-Ownership Cases

Angola: 1974-2000

Existence of a Major Mineral Export Angola is currently sub-Saharan Africa's second largest petroleum exporter. The Belgian company Petrofina first discovered oil in 1955. This company was reorganized in 1966 as Fina Petróleos de Angola (PETRANGOL). The oil sector was greatly expanded in 1966 with the discovery of offshore oil at Cabinda. By 1973, oil had become the major export of Angola (Hodges, 2001, 143). This sector continued to grow: by 1978, oil represented 74% of exports, 38.1% of government revenue (Africa South of the Sahara 1978).[16] In 1986, oil provided 95% of total exports accounting for 35% of GDP and 40% of state revenues. As late as 2000, these figures still show petroleum's importance to the Angolan economy, with 90% of total exports accounting for 40% of GDP and 80% of state revenues.

State Ownership of the Oil or Mineral Sector After independence, SONANGOL was established to manage all fuel production and distribution. With the passage of the petroleum law of 1978, the state became the sole owner of all of the country's petroleum deposits with SONANGOL the only concessionaire for oil development or exploration (Hodges, 2001). SONANGOL was to have at least 51% of all joint ventures, and it was the majority owner of the Cabinda Gulf Oil Company (Cabgoc) which accounted for over 50% of total production in 1985. Although SONANGOL was to have a majority share in stock, daily operations were to be managed by foreign companies. To attract investment by foreign oil companies, SONANGOL split the petrol fields into 13 "exploration blocks" in which foreign interests could have a stake under production-sharing arrangements.

In 1990, however, Angola abandoned Marxism-Leninism and some privatization of major companies ensued. However, SONANGOL was still to be the sole concessionaire for oil ownership and could operate with other companies either as joint ventures or by negotiation production-sharing arrangements (PSAs). By 1992, one of the major joint ventures had a decline in the level of state ownership to 41%, which would put its majority state ownership status in question. In 1992, SONANGOL sold 10% of its share to Elf Aquitaine and thereby lost majority ownership of the Cabgoc fields (which provide approximately two-thirds of total output). Nonetheless, SONANGOL continues to own 100% of all other oil fields and 51% or more of all joint companies. It also continued to hold a majority share of most capital-intensive industries in the country through the end of this study.

Nigeria: 1966- 2000

Major Mineral Exports: Nigeria is the largest oil exporter in Africa as well as the fifth largest in OPEC. Although oil was only discovered in 1956, by 1969, it represented 42% of all exports. This grew to over 90% of export earnings every year from 1975 onwards. By the end of 2000, the economic contributions of oil accounted for 97% of export earnings, 20% of GDP, and more than 70% of government revenue.

State Ownership of the Oil or Mineral Sector Following the first discoveries in 1956, petroleum in the Niger River delta was commercialized by Shell-BP, which began production in 1958. From 1960-70, exploration and extraction rights were contracted through foreign companies.[17] In 1971, the state created the Nigerian National Oil Corporation (NNOC) to facilitate government ownership in the oil concessions. Then in 1972, the Nigerian Enterprises Promotion Decree required that the state be granted 51%

ownership in key sectors, especially petroleum. Following the merger of the NNOC and the Ministry of Petroleum Resources, the Nigerian National Petroleum Corporation (NNPC) was formed in 1977 and sought to increase Nigerian shareholding in most of the foreign-operated companies. According to these terms, the "NNPC had 60% interest in the operations of Agip-Phillips, Elf-Aquitaine, Gulf, Mobil, Texaco and Pan Ocean, and had an 80% share in Shell (which accounts for one-half of total production)" (Africa South of the Sahara, 2000, 832).

Zambia 1966 - 2000

Major Mineral Exports Copper has been important for Zambia from before independence through 2000. For the first five years of independence, copper accounted for about 60% of government revenues (Quinn, 2002, 64). Moreover, the mining sector accounted for over 95% of foreign exchange revenues from 1968 until 1973, while also accounting for about one-quarter of GDP. Following a swift decline in world copper prices in 1975, by 1983 copper production contributed only 15% of GDP compared to 33% in 1970, though its relative share in exports did not noticeably decline. By 1991, copper extraction contributed to 93% of foreign exchange earnings, falling to 68% in 1994, and falling again to 52% in 1996. By 2000, the proportion of foreign exchange earned by copper export dropped to about 54%.

State Ownership of the Oil or Mineral Sector In 1969, President Kaunda nationalized both major copper groups to a level of 51%. However, the costs of this acquisition were assessed at book value, and they were to be paid with future profits (Sklar, 1975). These two nationalized companies were consolidated into Zambia Consolidated Copper Mines (ZCCM) in March 1982 in which the state owned 60.3%. Talks of privatization began following multiparty elections in 1991 and a deteriorating economic situation. Proposals to sell the ZCCM to private-sector owners began after the elections, though it was only finally sold in 1999.

Non-Majority State-Owned Cases: Botswana 1972 - 2000

Major Mineral Exports The existence of mining came as a post-independence surprise in Botswana. In fact, a British survey as late as 1965 found no evidence for a lucrative, large-scale mineral sector. However, with the discovery of the Orapa diamond mine in 1967, large-scale mineral exploitation finally began in 1971. Just one year later, diamonds accounted for 43.5% of total exports, rising to over 50% in 1976 (African South of the Sahara, 1974). By 1982, the contribution of the mining to export earnings rose to 75%. Two other mines opened in 1982 and 1983, resulting in a total rise of output of 164% from 1981-1986. Botswana also has a copper mineral sector, though it produces significantly less to export earnings and GDP.

State Ownership of the Oil or Mineral Sector Unlike many other mineral exporting countries, Botswana has less than a majority share of this sector. However, it is also unique in that it has exactly 50% ownership. By law, Botswana can demand between 15 and 25 percent of stock from mining companies, and it can purchase up to 50% (Cobbe, 1979, pp. 192, 208). In fact, the parastatal De Beers Botswana Mining Company (DEBSWANA) is jointly owned by the state of Botswana and De Beers Mining Company, which is the sole diamond mining interest in the country. The state also has minority ownership of the next-largest extractive industry of copper-nickel, owning 15% of Botswana Roan Selection Trust.

Cameroon 1980 - 2000

Major Mineral Exports Beginning in 1977, four oil fields owned by Elf Aquitaine (now part of Total) began to produce, and petroleum soon grew to be the nation’s principal export by 1980. In 1982, oil represented 43.1% of export earnings and 15.3% of GDP (Africa South of the Sahara, 1988). It grew rapidly during this period, until the fall of OPEC and oil prices in 1985. Although the returns to this sector were uneven given volatility in prices, in volume Cameroon production continued to climb until 1988. Thereafter, it declined slowly until petroleum only accounted for 29.3% of exports in 1999.

State Ownership of the Oil or Mineral Sector Though maintaining a cautious growth rate of state participation in the economy, Cameroon has not sought to nationalize its oil sector. Elf Aquitaine, (a French-owned company) has been responsible for most major oil exploration in Cameroon. Nonetheless, in 1982, Cameroon created the state corporation, *Societe Nationale des Hydrocarbures* (SNH), which obtained a 20% stake in all petroleum-producing companies, but this is clearly less than 50%.

Gabon 1967 - 2000

Major Mineral Exports Gabon is the third largest producer of petroleum in sub-Saharan Africa. The petroleum industry began in 1967 with the opening of the Gamba-Ivinga offshore oil deposit. In 1980, the petrol sector's share of GDP reached 40.4% and 80.9% of export earnings. Continuing to 1985, the petroleum sector accounted for 83% of total export earnings, 40% of GDP, and 65% of state revenues. In 2002, the petroleum sector contributed 78.7% of total export revenues and 40.8% of GDP.

State Ownership of the Oil or Mineral Sector Though exploitation of the oil fields began in 1956, significant expansion of the sector did not occur until the late 1960s. The primary producer was originally Elf-Gabon (a 25:75% joint venture between the state of Gabon and Elf-Aquitaine). However, Shell-Gabon became the main producer in 1993, following the opening of the Rabi-Kounga fields, though they operated the field in association with Elf-Gabon and Amerada-Hess. Finally, in 1995 Energy Africa (a South African company) bought 40% interest in three fields bordering the Rabi-Kounga as well as several smaller offshore interests. None of these were majority state (Gabon) owned.

Comparing majority state owned countries to non-majority state owned countries

We have examined the individual cases in sequence, and shown that each was a major oil or mineral exporter as well as showing which countries featured majority state ownership. We now examine and compare each of the mineral curse measures according to type of ownership. We also calculate a hypothesis rejection test for the two averages. If there are no significant differences in economic and policy outcomes between the two sets of countries, then we will be unable to reject the null hypothesis that both sets of countries operate in the same manner. The results of these hypothesis rejection tests are found on Table 1.

<Table 1 about here>

As we can see from Table 1, countries without majority state ownership had significantly different levels for the variables considered part of the resource curse. In every category, except for the percent change in agricultural exports, countries without majority state ownership had significantly different averages than did countries with majority state ownership of their mineral sectors. Moreover, in every case, the outcome was worse for the country with MSO, even agricultural output.

First, MSO countries had much lower average incomes, with MSO countries with per capital incomes of $1,238 compared to $4,930 for non-MSO countries, which represents a difference of $4,118.83 per person. Second, MSO countries had lower growth levels at **negative** 1.2% compared to 2.77% for non-MSO countries. This represents a difference of almost 4% growth rates average for the period of the study. Third, debt-to-GDP ratios were much higher for MSO countries, with an average of 113.85% compared to 43.5% for non-MSO countries. This is an average of 70.35% difference. Fourth, MSO countries had lower percent change in valued added in manufacturing at 2.99%, compared with 8.03% for non-MSO countries. This represented over a 5% difference between the two categories. Fifth, investments were lower in MSO countries with averages of 10.27% compared to 13.64% for non-MSO. This difference of 3.37% is especially telling, as much of the justification for the nationalization of mines was to increase domestic investment and keep profits from leaving these countries.[18] Sixth, countries with MSO had more authoritarian polities, on average, than did non-MSO countries with a -3.988 compared to a -2.043, respectively. Finally, countries with majority state ownership had more international and internal conflicts, by every measure, than did countries without majority state ownership. The percent propensities for militarized disputes were 0.857 for MSO countries compared to 0.3895 for non-MSO; first use of violence was 0.40 for MSO countries and 0.17 for non-MSO; and intrastate conflict was 0.2381 for MSO and 0.0526 for non-MSO.

One potentially surprising result is that these countries differed on levels of currency appreciation, as measured by percent change of exchange rates. Currency appreciation, or a period of it, is often assumed to be a leading factor in the Dutch Disease. However, in this sample, all six countries had currencies that depreciated over time. Moreover, countries with MSO had higher levels of currency depreciation, and countries without MSO had much lower levels of depreciation. Using either official or unofficial measures of currency appreciation, MSO countries had much higher rates of depreciation than did non-MSO countries. Currency depreciation can also be interpreted as an international lack of confidence in the currency as well as higher rates of domestic inflation with a pegged currency. Moreover, the ratio of currency overvaluation to official levels was much higher in majority state owned economies at about 5 million percent compared to 2.08%. Since currency overvaluations subsidize imports and taxes exports, here may be the source of an additional “Dutch disease” effect in Africa. Therefore, the “African Dutch Disease” is currency depreciation combined with a pegged currency, not appreciation. However, combined with currency overvaluation, currency depreciation has the same effect as currency appreciation and a floating exchange rate – to lower returns to the alternative exporting sectors relative to other domestic returns.

The only variable that measured some effect of the resource curse that was not statistically different between the two sets of countries was percent change in the value of agricultural exports. It was higher in the countries without MSO, but not significantly so. So, using a variety of mineral exports and only distinguishing by majority state ownership, it appears that the resource curse is more sever in countries with majority state ownership than those with 50% or less state ownership.

However, some may question if the differences not controlled with the diversity across minerals, diamond, oil or “Botswana exceptionalism” may be causing some of the noted differences. To control for these, we run the data only looking at countries that export oil. The results are found in Table 2.

<Table 2 about here>

With the results from Table 2, we again see that most of the categories of mineral resource outcomes are worse in countries with majority state ownership of their oil sector relative to those with less than majority state ownership. Like in Table 1, we find that countries with majority state ownership of oil featured significant differences for many categories. First, they featured lower per capita incomes ($1,309 v $5,428 representing a $4,118.83 difference). Second, they had negative growth rates compared to positive growth rates for non-MSO countries (with a net difference of 2.12%). Third, they experienced higher debt relative to GDP (90% v 54%). Fourth, MSO countries had more currency depreciation, officially (-2.88% v -0.05%) and unofficially (-1.68% v -0.06%). Similarly, they had more currency overvaluation (8,000,000,000% v 2.62%). They also had lower levels of investment as a percentage of

GDP (8.45% v 10.65%). Finally, MSO oil exporting countries experienced higher propensities for violence on all three measures when compared to less than majority state owned oil exporting countries: MIDD 0.73 v 0.23, Civil War 0.38 v 0.08, and FUVF 0.46 v 0.13.

In contrast with the larger model, the differences in growth rates between the two types of oil exporters were not statistically significant, though the findings were consisted with our expectations. The countries with less than majority state ownership experienced positive growth (0.8%) for the period, while those with MSO had negative growth (-1.3%). Also, countries without MSO had higher percent change (almost twice) in valued added in manufacturing (5.1 v 2.6) as well as agricultural exports (8.46% v 0.5%), though these differences were not significant given the variances. The one surprising result from Table 2 in comparison to Table 1 is that countries with MSO were significantly less authoritarian than were countries without MSO. This is a complete reversal of finding from Table 1. Nonetheless, countries with MSO of oil (Nigeria and Angola) had an average of -3.8, which is still authoritarian, though Cameroon and Gabon were more authoritarian at -6.95. Most of the differences between these two categories involve a greater political liberalization for Nigeria and Angola than for Cameroon and Gabon in the post-Cold war period: all four liberalized, though Nigeria and Angola experience greater liberalization. During the Cold War period, all four were nearly equally authoritarian, though Nigeria had a period of political liberalization from 1978-1983. This political liberalization was not consolidated and Nigeria returned to authoritarian politics until the 1990s.[19]

However, since the resource curse literature makes strong predictions about how such sectors undermine democracy, and we can show that Botswana had a strong, continuous democracy, then using the larger sample would probably be a fairer comparison. Moreover, those arguing that oil is different from other minerals in their ability to undermine democracy would not be puzzled by Cameroon's and Gabon's authoritarianism. However, they could not explain Nigeria's brief period of democratization. They too might argue that Nigeria did not consolidate their democracy during the earlier period (or even recently). However, the key findings about majority state ownership and economic policy, as well as violence, remain mostly supported within the smaller sub-sample of oil exporters. This is consistent with our logic.[20]

So what do these results mean for the resource curse? Since we did not create comparisons between mineral/ oil exporters and non-mineral / non-oil exporters, we cannot say if the differences are large in comparison to such a control group. However, we did show that countries that owned more than 50% of its largest mineral or oil export sector suffered more intensely from the most important outcomes normally ascribed to the mineral resource curse. In the larger sample, they featured lower levels of growth, lower incomes, lower levels of manufacturing value added, less democracy, higher levels of debt, higher levels of currency overvaluation, and more conflict. In the smaller sample, some variables became insignificant, though the directions of the earlier relationships were maintained, except for democratization. In addition, countries with MSO did have higher levels of currency depreciation, and this seem to lead to the same negative economic outcomes normally attributed to appreciation.

However, limiting our sample to just the oil countries, those with MSO also seemed to suffer from more resource curse effects, especially in areas of incomes, currency depreciation, currency overvaluation, debt, investment, and violence. The differences in growth are less pronounced, though they are more in the expected direction. The differences in per capita incomes may be attributable to Gabon's and Cameroon's smaller populations, but it is impossible to climb in per capita incomes with a negative growth rate, as experienced by Nigeria and Angola.

One could suggest that we did not control for one important variable: the size of countries involved. In each case, the larger countries had majority state rule, and the countries smaller in population did not have majority state rule. This is true; however, Auty and Gelb (2001) argue that resource curse effects should be more pronounced in smaller countries than in larger ones. Therefore, according to their logic, the difference between state owned and non-state owned should be even larger.

The one area where no differences were determined in either sample was the level of agricultural growth. Although the non-MSO countries did have higher growth in this area, it was not significant for either sample. And in the sample with just oil countries, the valued added in manufacturing became insignificant, though non-MSO countries did have higher levels.

Therefore, it seems to be the case that much of the negative outcomes attributed – solely or primarily – to mineral or oil abundance may actually be partially due to the majority state ownership of these assets. Clearly more work needs to done in this area, but at a minimum we have shown, in a most similar and longitudinal study, that countries in sub-Saharan Africa with MSO of either their major oil or mineral exporting sectors had worse resource curse effects than other similar countries without MSO. The normal literature on the resource curse would be at a loss to explain these differences, though we offer the variable of majority state ownership to account for most of this variance. According to standard resource curse literature, both sets of countries should have suffered equally – though maybe the smaller countries should have suffered more – should the nature of ownership not have mattered and most policy faults were due to minerals or oil.

That a privatization to 50% or less may lessen or reduce resource curse effects may be deduced from the Botswana case, though this was not directly tested. Since Botswana owned 50% of its parastatal, the argument for complete privatization is not supported here.[21] Moreover, even if partial privatization will work, the problem is that some significant lags may be associated with changing these outcomes. In fact, the incentive structures that have been in place vis-à-vis majority state ownership may have legacy effects that last much longer than their mere removal. Corruption and other policy regimes are unlikely to reverse themselves immediately with the introduction of new incentive structures. This presumption requires further research beyond the scope of this paper, and may require decades to decide.[22]

Nonetheless, we did show that countries without majority state owned had better economic trajectories and experienced less severe problems usually blamed on the mineral exporting sector. Clearly more work needs to be done, but we can claim from this study that what previous scholars have fully attributed to resource curse effects should be – at least partially – attributed to majority state ownership of oil or mineral exporting sectors – at least in sub-Saharan Africa.

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Table 1

Differences in Means Test (T-Test)

Variables	Ownership[23] MSO?	Mean	Mean Difference [MSO - nonMSO]	standard Deviation	Probability P value	N
Per capita Incomes	Yes	1238.24	-3692.12	349.40	0.000***	80
	No	4930.36		2817.44	0.000***	94
% change Incomes	Yes	-0.0120	-0.0397	0.0755	0.003***	80
	No	0.0277	(-3.97%)	0.0958	0.003***	92
Ratio: Total Debt /GDP	Yes	113.85	70.35	74.99	0.000***	76
	No	43.5		29.31	0.000***	87
% change value added Manf	Yes	0.0299	-0.0504	0.1336	0.027**	76
	No	0.0803	(-5.04%)	0.1422	0.027**	74
% change Ag exports	Yes	0.0699	-0.0311	0.5331	0.689	75
	No	0.1010	(-3.11%)	0.445	0.693	84
% change Official Exchange rates	Yes	-1.929	-1.8723	7.460	0.017**	81
	No	-0.0567	(-187%)	0.176	0.0270**	92
% change Unoff Exchange rates	Yes	-1.0733	-1.0098	3.915	0.021**	63
	No	-0.0635	(-101%)	0.2160	0.044**	81
Currency over-valuation	Yes	5E*009	4.9E*009	1.515E*010	0.005***	76
	No	2.0803		5.340	0.009***	86
Investment as % GDP	Yes	10.268%	-3.372%	5.591	0.001***	80
	No	13.64%		7.352	0.001***	94
MIDD/ Interstate dispute	Yes	0.8571	0.4676	0.9712	0.000***	84
	No	0.3895		0.6887	0.000***	95
Intrastate dispute/ Civil War	Yes	0.2381	0.1855	0.4285	0.000***	84
	No	0.0526		0.2245	0.001***	84
FUVF First use of Violent force	Yes	0.40	0.23	0.661	0.005***	84
	No	0.17		0.429	0.006***	95
Polity/ democracy	Yes	-3.988	-1.945	5.152	0.038**	84
	No	-2.043		7.019	0.035**	94

Significance next to mean for MSO = equal variances assumed
Significance next to mean for not-MSO = unequal variances assumed
*** Significance at higher than 99%/
** Significance at higher than 95%
* Significance at higher than 90%

Table 2/ Oil Only
Differences in Means Test (T-Test)

Variables	Ownership[24] MSO?	Mean	Mean Difference [MSO - nonMSO]	standard Deviation	Probability P value	N
Per capita Incomes	Yes	1309.74	-4118.83	405.92	0.000***	48
	No	5428.57		3111.13	0.000***	62
% change Incomes	Yes	-0.0125	-0.0212	0.0919	0.264	48
	No	0.0087	(-2.12%)	0.1021	0.258	61
Ratio: Total Debt /GDP	Yes	90.322	35.712	63.65	0.000***	45
	No	54.61		29.91	0.001***	57
% change value added Manf	Yes	0.0258	-0.0248	0.1658	0.447	44
	No	0.0506	(-2.48%)	0.1300	0.443	41
% change Ag exports	Yes	0.0051	-0.0795	0.5253	0.420	46
	No	0.0846	(-7.95%)	0.4609	0.426	55
% change Official Exchange rates	Yes	-2.8872	-2.3742	9.394	0.021**	50
	No	-0.0513	(-237%)	0.203	0.038**	60
% change Unoff Exchange rates	Yes	-1.6842	-1.6254	5.3086	0.031**	33
	No	-0.0588	(-162%)	0.2378	0.088*	51
Currency over-valuation	Yes	8E*009	7.8E*009	1.906E*010	0.003***	46
	No	2.6205		2.2605	0.008***	55
Investment as % GDP	Yes	8.454%	-2.192%	4.023	0.041**	48
	No	10.646%		6.414	0.031**	62
MIDD/ Interstate dispute	Yes	0.7308	0.505	0.8193	0.000***	52
	No	0.2258		0.4932	0.000***	62
Intrastate dispute/ Civil War	Yes	0.3846	0.304	0.4913	0.000***	52
	No	0.0806		0.2745	0.000***	62
FUVF First use of Violent force	Yes	0.46	0.33	0.727	0.002***	52
	No	0.13		0.383	0.004***	62
Polity/ democracy	Yes	-3.8239	-3.1269	4.545	0.000***	52
	No	-6.9508		2.125	0.000***	61

Significance next to mean for MSO = equal variances assumed
Significance next to mean for not-MSO = unequal variances assumed
*** Significance at higher than 99%/
** Significance at higher than 95%
* Significance at higher than 90%

Endnotes

[1] Ross (1999) suggested that the early literature lacked large-n empirical studies confirming these results, though the subsequent works of Wantchekon (1999), Jensen and Wantchekon (2004), Auty (2001b), and Ross (2001) supplement this gap. Nonetheless, Davis (1995) found no relationship between minerals or oil and key economic measures.
[2] These were in Malaysia, the Philippines, and Indonesia. In his 1990 piece, he suggests state ownership as a possible explanation for the curse.
[3] Congo Brazzaville did not have majority state ownership of their oil sector, but it did have majority state ownership of most capital-intensive industries, so it could not be included in this analysis. It was the only other country in sub-Saharan Africa with a major exporting mineral/ oil sector and without majority state ownership.
[4] Although they make their argument theoretically, and they do not use a case-illustrative approach as opposed to a statistical analysis or most similar design.
[5] This is not to say that states do not have other sources of influence.
[6] Ownership is clearly not the only form of power available to host-national governments or MNCs. However, ownership is a measurable and identifiable aspect of manifest power. Although minority shares can be controlling, such minority control would be challenged the companies run at a loss; the other owners would simply vote this managerial minority out of office. By contrast, a government could inefficiently run a host-national company as long as the minority owners have a sufficient return on their investment. If not, they would exit.
[7] By contrast, Grosh (1991) argued that state owned sectors **could be** as efficient as privately owned ones. Luong and Weinthal (2004) also examine countries with majority state ownership of oil and those that do not, though they stress private domestic versus private foreign ownership patterns. Moreover, they do not test in sub-Saharan Africa, only in Eastern Europe.
[8] Although employees in privately owned firms may also face adverse incentives for whistle blowing, the private owners would have self-interests to attempt to ferret out theft and inefficiencies.
[9] Weinthal and Luong Jones (2006) suggest that a domestic owned mineral company would have fewer resource curse effect.
[10] See Quinn (2002); Luong Jones and Weinthal make a similar point (2006).
[11] Ethnolinguistic fractionalization is also mostly held constant. Although it is low in Botswana (.399), it is high in Gabon and Cameroon (.879 and .808, respectively). For Angola, Nigeria, and Zambia it is .783, .857, and .902, respectively. Numbers take from http://weber.ucsd.edu/~proeder/elf.htm
[12] We could have also included Algeria, Ghana, or Zaire without changing the results. The only country that was a major oil or mineral exporter with less than 50% government ownership of this sector and was excluded was the Republic of the Congo. Since it featured majority state ownership of all of its industries, it has to be coded as majority state owned. South Africa is excluded as its developmental trajectory was unique during this period, though it would have been considered not majority state owned, and did seem to escape most of the traps of the resource curse during this period.
[13] We consider a country to be a mineral resource rich country if these minerals constitute the major export or more than 40% of exports for most years after the threshold is met. The starting points for countries are these: Botswana 1971, Cameroon 1980, Gabon 1967, Nigeria 1969, and Zambia 1966. Angola became independent in 1974, so we being that year. We only include countries beginning with years in which they are clearly a major oil or mineral producer. Otherwise they began in 1966 as mentioned above. If we included years before, then we would be capturing non-mineral curse effects or colonial effects. However, Angola had a partial privatization of it mineral resources, Angola. Since majority state ownership is measured on the state level, and Angola had MSO of its industries, it remains coded as “majority state owned” even after their mineral sector was somewhat privatized. Moreover, this is a structural argument and privatization would have a lagged effect – privatizing would not have the same outcomes as never having nationalized the mineral sector: the under-investment, the spending patterns, and the infrastructural patterns would have been established earlier. Nonetheless, for added rigor, we also calculated the results excluding Angola after 1992 with its partial privatization, but we found similar results.
[14] We also include data from Pick’s Currency Year book and World Currency Year Book.
[15] It is calculated by unofficial t – unofficial t+1/ unofficial t. The sources are Pick’s Currency Year book, World Currency Year Book, African development indicators 1992, and African development indicators, CD.
[16] Unless stated otherwise, like the data for the dependent variables, the data for each country comes from Africa South of the Sahara, various years.

[17] Much of this section is taken from: http://www.nnpcgroup.com/history.htm

[18] For an overview of ideas of development economists, see Meier and Seers (1984). Also, see Depak Lal, 1985.

[19] One could argue that Federal status may have helped Nigeria maintain a partial democracy through creating a fragment of accountability Sklar (1987). Also by dropping Botswana, we drop our only former British colony with non-MSO, which is often held as helping democracy.

[20] See above endnote.

[21] Weinthal and Luong (2006) would argue that it requires domestic ownership of minerals to have good outcomes, this is not supported here as the private owners in our three cases were mostly MNCs from outside the countries.

[22] However, this argument can be seen in Quinn (2008 (forthcoming)). See also Rose-Ackerman (1999).

[23] Countries that later had majority state ownership were coded as non-majority state owned prior to nationalization, should that have occurred after independence.

[24] Countries that later had majority state ownership were coded as non-majority state owned prior to nationalization, should that have occurred after independence.