



Institutional Design in Low-Capacity Oil Hotspots

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Abstract:

From Ghana to Timor-Leste, many new or prospective oil producers are establishing or reforming national oil companies (NOCs). Their governments are looking at the experience of existing producers to choose an institutional design that can effectively manage their NOCs and foreign oil companies while minimizing governance risks. However, research on NOC governance has focused almost exclusively on large, well-established oil producers such as Saudi Arabia and Norway, which have geological prospects and institutional capacity levels that may make them difficult for the world's new oil hotspots to emulate. The context is substantially different in most new or prospective producers, where administrative, human and oil-sector capacity are generally low. These governments face daunting challenges in light of their capacity constraints. Which body do they task with licensing, regulatory and monitoring responsibilities: the NOC, the ministry of oil or a separate regulatory agency? In cases of weak capacity, governments face the dilemma of either concentrating responsibilities and resources in order to build capacity quickly within a single institution, or separating functions to build the foundations for good governance. We offer five research propositions on the connections between country capacity and effective oil-sector institutional design to allow governments to more effectively structure their decisions about how to manage their petroleum resources.

1. *Low-capacity countries have a stronger history of technical and economic success when resources are concentrated in the NOC, rather than rigidly separated across distinct administrative bodies.*
2. *Too much concentration of power can exacerbate accountability problems. Successful implementation of a separation-of-powers model can improve accountability, but many attempts to install such a model fail to take root.*
3. *Surrogate administrative capacity may be needed to prop up a separation-of-powers model in low-capacity countries.*
4. *Sequencing matters. Some countries may elect to concentrate powers initially and then separate them later. The likelihood of success of such an effort depends largely on whether other institutions have developed the strength to be an effective check on the NOC by the time the attempt is made to separate.*
5. *Concentration of power within a ministry—as opposed to separation of powers or concentration within an NOC—represents the path of least resistance in many low-capacity countries, but its chances of success are poor when there is limited administrative capacity.*

I. INTRODUCTION

This paper focuses on low-capacity countries that are increasingly being courted by investors seeking access to petroleum resources. In emerging oil hotspots, there is a growing interest in promoting national participation, largely by securing stakes in projects for national oil companies (NOCs). Some of these countries are new producers or remain in the exploration phase without having made any significant commercial discoveries, while others are established producers on a relatively modest scale and are now attracting renewed interest. The key question that emerges in all cases is how to organize and manage the petroleum sector in order to maximize the public benefit derived from oil and gas resources. In particular, what role should the NOC and other governing bodies have?

This paper is situated within a rich literature seeking to explain why many petroleum-rich countries have failed to transform wealth in the ground into durable national development, and in many cases have experienced lower growth and more severe conflict and corruption than their resource-poor peers (Sachs and Warner, 1995; Karl, 1997; Ross, 1999; Humphreys, Sachs and Stiglitz, 2007). More specifically, we address the relationship among institutional structure and the goals of economic development and political accountability. We also examine the argument—canonical in good-governance literature—that oil producers are most likely to succeed when they separate commercial, policymaking and regulatory functions across distinct public bodies and restrict NOCs from performing any regulatory duties (al-Kasim, 2006; World Bank, 2011a; Natural Resource Charter, 2010; Stevens, 2008). Following from Thurber, Hults and Heller (2011), we argue that the capacity level of a country at the time it seeks to establish an institutional structure has a major impact on which sorts of arrangements are most likely to succeed. The experiences of Norway or Kuwait undoubtedly hold some important lessons for countries like Sierra Leone or Timor-Leste. But the vast disparities in capacity suggest that these new hotspots—with fragile public institutions and finance and human resource gaps sometimes exacerbated by years of conflict—should seek approaches that better fit their own circumstances.

Our analysis focuses on the decision about what type of governance model a state should construct to promote effective management of the oil sector and the advancement of key national interests, in particular on the division of responsibilities among the public bodies charged with managing the sector. Of particular significance is the assignment of powers to regulate and oversee the sector. Countries with NOCs have tended to assign administrative responsibilities according to three basic models:¹

- a. *Separation-of-powers model (also referred to as the Norwegian model)*: An independent technocratic agency has regulatory powers.

- b. *Ministry-dominated model*: The petroleum ministry or an equivalent executive body is charged with regulation and oversight.
- c. *NOC-dominated model*: The national oil company has de jure or de facto responsibility for day-to-day regulation, sometimes including the power to award exploration/production licenses.

We examine the experiences of countries in low-capacity settings, both current and historical, to assess which models have best promoted success, defined in two ways. First, success includes a measure of accountability. An oil sector in which decision-making and executive bodies are accountable, both to the country's leadership and to the public, is most likely to promote broad-based national development and avoid some of the most serious governance maladies that often stem from oil (Humphreys, Sachs and Stiglitz, 2007; Natural Resource Charter, 2010). In line with the *Chatham House Document on Good Governance of the National Petroleum Sector* (Lahn et al, 2007a), we posit that accountability is strengthened by clarity of goals, roles and responsibilities, and the transparency and accuracy of information. Drawing from the Chatham House framework, we use the following benchmarks to help standardize assessments of success in accountability:

- Clear, formal delineation of roles and responsibilities among actors involved in the sector, which is followed in practice;
- The NOC and/or foreign oil companies collect and provide to the state clear, accurate data on operations and financial results, and the state audits these results;
- Official institutions of government exercise effective control over the activities of public officials and other actors with responsibility for the sector;
- The national oil company and other executive bodies report regularly on their activities to the legislature and the public.

Our second success measure is the economic and technical performance of the petroleum sector. Viewed through this lens, a state succeeds if the petroleum sector develops efficiently and contributes to state revenues. Following from Victor et al (2012) and Thurber et al (2011), our measurement is based on the following benchmarks:

- If the state is producing petroleum, its rules and procedures encourage efficient production and give the state a fair share of revenues;
- If the state is still exclusively in exploration, it encourages effective exploration efforts and reaches stable agreements with private partners that give the state a significant share of any benefits that accrue from eventual production.
- The state monitors the activities of operators and collects revenue effectively.ⁱⁱ

- If the goals assigned to public bodies include building capacity in the national private sector (or building operational capacity within the NOC), this capacity develops according to government goals.

We examine 12 current and historical cases in which governments have introduced one of these three petroleum governance models amid challenges of low capacity. This analysis suggests the following findings, which governments should take into account as they establish oversight structures for their national petroleum sector:

1. *Low-capacity countries have a stronger history of technical and economic success when resources are concentrated in the NOC, rather than rigidly separated across distinct administrative bodies.*
2. *Too much concentration of power can exacerbate accountability problems. Successful implementation of a separation-of-powers model can improve accountability, but many attempts to install such a model fail to take root.*
3. *Surrogate administrative capacity may be needed to prop up a separation-of-powers model in low-capacity countries.*
4. *Sequencing matters. Some countries may elect to concentrate powers initially and then separate them later. The likelihood of success of such an effort depends largely on whether other institutions have developed the strength to be an effective check on the NOC by the time the attempt is made to separate.*
5. *Concentration of power within a ministry—as opposed to separation of powers or concentration within an NOC—represents the path of least resistance in many low-capacity countries, but its chances of success are poor when there is limited administrative capacity.*

It is not our intention to assert that institutional structure is the only, or even the dominant, determinant of a country's success. Geology fixes fundamental possibility frontiers, both positive and negative, and thus dwarfs all other factors. The broader political context, including overall levels of transparency and the government's commitment to accountability, also plays a determining role. But as a state thinks about how to manage the resources it does have in light of its political and economic context, institutional structure can have a major impact on performance.

II. DEFINING LOW CAPACITY

Our designation of a country as having “low capacity” is based on the following three elements.

A. Administrative Capacity

This relates to state capacity to formulate effective public policy, deliver public services, and enforce the law. Regardless of the institutional design selected for

the oil industry, a state with low administrative capacity faces steeper challenges in oil-sector management than a state with higher capacity. Following from Thurber et al (2011), we also posit that administrative capacity may have implications for the chances of success of these institutional models.

When data is available, our ranking of administrative capacity is based on the average of scores in the World Bank's Government Effectiveness Indexⁱⁱⁱ and the World Economic Forum's (WEF) ranking on *Institutions in the Global Competitiveness Report*.^{iv} When a particular country is ranked on only one of the indices, we use that score in our determination. Otherwise, our ranking of specific countries outside this standardized data set is based on our estimate of their capacity in relation to other known cases, supplemented by secondary sources. Table 2 (p. 29) presents our estimates of administrative capacity levels for our cases in the year in which they first adopt an institutional structure for the petroleum sector or embark on major institutional reform.

B. Human Capacity

New producers have a limited talent pool from which to draw as they seek to build institutions responsible for the petroleum sector. Limited human resources necessitate a careful allocation of talented graduates, which may involve building a limited number of units with a critical mass of expertise (or risking a dilution of effective capabilities).

Though capacity-building efforts in new producing countries often emphasize specialized petroleum-sector training, the baseline education level of the population also appears to be crucial. It takes less time to raise the level of specialized learning in a population that already has a solid primary and secondary education, measured here using the WEF's survey data on higher education and training.^v

Several African oil hotspots are not included in the WEF's global rankings, but the Ibrahim Index rankings for human development highlights the variance among African countries, based on measurements of the levels of health, welfare and education. The measure provides a profile of the quality of a country's human capital base and its ability to participate in the global knowledge economy (Ibrahim Index, 2010). Human capacity ranking of our cases is listed in Table 2.

C. Sector Capacity

No standardized index measures national petroleum-sector capacity. We based our classification of low-capacity countries on qualitative assessments derived from existing research, and our own experiences in several of the countries in our sample. Our ranking on a scale of 1 to 5 is based on the degree to which actors responsible for the sector understand the commercial and operational requirements of the petroleum industry. We begin with the assumption that a country has low capacity in petroleum-sector management (score 1/5 in the ranking of capacity in Table 2) when it is in the early stages of exploration, except

where the government has taken over existing institutions that were managed by private-sector players. Low-medium capacity cases (score 2/5) include emerging producers that have laid out terms of investments and regulations for operations and, conversely, long-producing countries that have developed limited expertise in sector management but remain heavily dependent on outsiders. Medium capacity (score 3/5) encompasses cases with an established set of skills and knowledge of the petroleum sector, but require support from technical advisors to set up or enforce the regulations for operators. It also includes cases in which decision-makers depend on the advice of foreign oil company partners to make decisions about development programs. Medium-high (score 4/5) capacity cases are those in which the NOC is operating some fields or the agency in charge of the sector is staffed by experienced technocrats. In high capacity (score 5) cases, the NOC can operate to a high standard without foreign investors.

We define a country as “low-capacity” if it possesses low or low-medium capacity (a score of 1 or 2 on our scale) in at least two of the three types of capacity delineated here. We selected 10 countries that had low capacity, with a balanced spread through our three models of governance: Democratic Republic of Congo (DRC), Sierra Leone, Gabon, Angola, Nigeria, Ghana, Sao Tomé e Príncipe (STP), Timor-Leste, Mozambique and Brazil. Three more countries with low to medium capacity are also discussed (though not the subject of in-depth analysis) because they offer interesting comparative insights. These are Algeria, Indonesia and Malaysia. We examine the above-mentioned cases at the time at which they introduced a particular petroleum governance model (and sometimes contrast between two periods in a single country).

III. REVIEW OF MAJOR INSTITUTIONAL PARADIGMS

Successful governance of the national petroleum sector requires strong organizations to design the rules by which the players operate and to oversee their activities. Determining which organizations to build up in order to achieve this goal is our principal question. This section lays out three models of institutional design, distinguished primarily by the allocation of regulatory responsibilities, and discusses some advantages and disadvantages associated with each.

A. Separation-of-Powers Model

The separation-of-powers model, almost synonymous now with Norway, provides for the creation of an independent body charged with allocating exploration and production licenses and monitoring activities in the sector, leaving the ministry and the NOC to focus their attention exclusively on policymaking and commercial activities, respectively. This model aims on one hand to empower the ministry to devise good petroleum policy and regulations for the sector and, on the other, to develop a skilled, purpose-built regulatory agency to oversee all oil companies operating in the country.

Parallel to these efforts, the NOC is encouraged to build operational capacity. Its role is less that of a custodian of the nation's resources and more that of a flagship company and center for technical excellence. It may also be required to contribute to the welfare of the nation through recruiting and training of nationals, for instance, but only insofar as it does not substitute itself for the state.

Implementing some form of the separation-of-powers model whereby an NOC has no regulatory responsibilities has become a standard recommendation by development agencies and analysts (al-Kasim, 2006; World Bank, 2011a; Natural Resource Charter, 2010; Stevens, 2008).^{vi} It confers several purported advantages. First, by separating the licensing/monitoring/regulatory body from the policymaker, a government privileges the development of technocratic skills and encourages its neutrality by keeping the agency at arm's length. Also, because the agency has no commercial participation in licenses, it reduces the risk of conflict of interest, ensuring that the priorities of the state, not the company, are driving oversight (Thurber et al, 2011).

Second, it is said to promote specialization. Freeing the NOC from having to worry about regulating the industry enables the company to focus on developing its core commercial capabilities.^{vii} Similarly, the regulatory body can focus its efforts on developing its core capacities.

Third, separation of powers can encourage stronger benchmarking and reporting. The model necessitates the creation of strong formal systems for reporting among the ministry, regulator and NOC, which can lead to better performance and accountability.

Finally, the separation-of-powers model can help countries avoid tunnel vision. Managing the oil sector through three separate actors can lead to frequent debate, and a government may foster innovation and filter out bad ideas and practices that sometimes persist when power is concentrated in one actor.

Despite these potential advantages, our cases emphasize that the separation-of-powers model is not ideal for all settings. In some countries, politics or institutional challenges prevent it from taking root effectively, with some cases showing that implementation actually can have detrimental effects. Creating and empowering three bodies to manage the sector requires a huge investment in terms of money, personnel and training. In countries with limited financial and human resources, it may not be possible to simultaneously empower three new institutions and have them perform their duties effectively.^{viii}

B. Ministry-Dominated

Some countries have vested the primary regulatory responsibility in the relevant sector ministry, which means that the policymaking function and the regulatory/monitoring functions are housed within the same body. Some of these countries, notably the United States, United Kingdom and Australia, never

created an NOC. In these situations, the government devises and enforces policies and regulations for oil operations, which are managed by private companies. Others, notably Norway and Equatorial Guinea, initially started on this path and only later created NOCs to play the sort of limited commercial role discussed above.

As in the separation-of-powers model, one purported benefit of this model is strong oversight of the NOC. If the monitoring and regulatory role is performed by a body that is separate from the NOC, it can hold the company to high standards and minimize conflicts of interest. By housing the regulatory function within the ministry, this system seeks to build policy coherence by connecting those empowered with regulatory authority closely to the policymakers. It can also ensure that regulators are backed by the political clout necessary to do their jobs effectively.

One potential advantage that both the ministry-dominated and NOC-dominant models have over the separation-of-powers model is that they require the state to invest in building capacity in one or two institutions, rather than in three separate ones. If a government decides not to create an NOC in the early stages of the development of the oil industry, then it can invest all of its resources in building competence within the ministry.

The flip side of this is that when the state does create an NOC but does not endow it with regulatory authority, the company may lack a meaningful mandate, particularly before it develops operational capacity, leaving it weak and potentially cash-strapped. There also exists a risk of politicization of the oversight function, given that a ministerial body closely tied to the country's political leadership makes the day-to-day oversight decisions.

C. NOC-Dominated

A system in which the NOC plays the dominant (de facto or de jure) regulatory role has in many cases been a natural outcome when the NOC evolved in a context of underdeveloped state institutions. When the oil sector was nationalized in several producing countries in 1970s, the NOCs developed their capacity quickly in order to take the place of foreign oil companies and maintain production. State administrative capacity was weak, development needs were great, and so many NOCs provided essential public services. In some cases, state institutions remained weak, and the country became increasingly dependent on the NOC.

This setup may provide countries with low institutional and human capacity a way to build sector capacity and exert effective national control over the sector more quickly. One of the major benefits accorded to state-owned companies is that they are often able to establish their own hiring procedures, training and benefits packages, and meritocratic promotion procedures. In many countries, this has enabled NOCs to make employment in the company more lucrative than is the

case within the civil service. Thus by housing the regulatory function within the NOC, it is marginally easier for the government to attract and retain highly skilled employees to perform the crucial monitoring and oversight role. Also, by concentrating resources and authority within the NOC, the leadership can also minimize the number of players who need to be involved with important decisions in the management of the sector and in the relationships with private companies. This can promote policy coherence and efficiency.

The risks involved in concentrating regulatory authority in the NOC relate primarily to accountability. When the NOC is supposed to monitor the performance of companies operating in the sector, including its own, the risk of conflict of interest is high. Tight control of costs, for example, may maximize the state's tax take but may not be consistent with the NOC's commercial interests. Moreover, granting the NOC greater control over the sector may exclude other state actors, such as the ministry of petroleum and even the ministry of finance, from decision-making and create thus an exclusive relationship between the presidency and the company. Since NOCs often oversee significant revenue generation and are led by highly skilled individuals, there is a risk that the company can become a fiefdom within the state that does not effectively promote national goals.

IV. HISTORICAL AND CURRENT EXPERIENCE IN LOW-CAPACITY COUNTRIES

Our sample of low-capacity countries includes countries with low or low-medium capacity in at least two out of our three our relevant capacity indicators—administrative, human and sectoral capacity—at the time that a particular set of strategic decisions about institutional roles was made.

A. NOC-Dominated Systems

1. Angola (1976 – 2011):

In post-colonial Angola, the oil sector grew amid a decades-long civil war and a disastrous series of economic policies, both of which served to leave administrative, human and industrial capacity among the lowest in the world (1/5 on our scale). The Angolan state made two fundamental decisions that shaped the sector. First, it concentrated power and human capital in its NOC, Sonangol, making the company the de facto concessionaire, policymaker and

Box 1: Criteria for Performance Rankings

Accountability:

- Clear delineation of roles and responsibilities among actors involved in the sector, both formally and in practice.
- NOC and/or foreign oil companies collect and provide clear, accurate data on operations and financial results to the state, and the state audits these results.
- Official institutions of government exercise effective control over the activities of public officials and other actors with responsibility for the sector.
- NOC and other executive bodies report regularly on their activities to the legislature and the public.

Technical/economic:

- If the state is producing, rules and procedures encourage efficient production and give the state a fair share of revenues.
- If the state is exclusively in exploration, it encourages effective exploration efforts and reaches stable agreements with private partners that give the state a significant share of any benefits that accrue from eventual production.
- The state monitors the activities of operators and collects revenue effectively.
- If the goals assigned to public bodies include building capacity in the national private sector (or building operational capacity within the NOC), this capacity develops according to government goals.

regulator.^{ix} Second, it overwhelmingly concentrated its capacity-building efforts on developing Sonangol's regulatory capacities, leaving exploration and production in the hands of international operating companies. For the first several decades of post-independence oil production, Sonangol did not aspire to be an operator. It is only in recent years, well after the Angolan oil industry had become a major revenue generator that the company has begun to focus more intensely on developing its exploration and production capabilities both at home and abroad. It now operates small fields in Angola.

Angola's approach has resulted in strong technical and economic successes. Despite the massive limitations in overall national capacity, Sonangol has developed into an effective regulator. It has overseen the flourishing of on- and offshore exploration and production activities that meet strong international standards for efficient development and technological innovation. It has proven to be a tough negotiator and supervisor of International Oil Company (IOC) costs, and it has delivered a strong share of oil revenues to the state while making Angola attractive to oil company investment—despite more than 30 years of war (Soares de Oliveira, 2007a; Heller, 2012). By focusing resources on one actor and empowering it to build its capacity and make critical decisions about sector strategy, the Angolan government has succeeded in creating an island of technical success amid broad capacity challenges.

That said, Angola's success measured in terms of accountability is mixed. The NOC has a clear remit and collects accurate data about its operations and financial results, which are audited by government (Human Rights Watch, 2010a). However, accountability processes are limited to a narrow relationship between the company leaders and the president's office (and key figures in the ruling party). As such, company leaders retain strong informal personal and financial ties with the ruling elite, and their views and strategies have been harmonious. But accountability to the population is extraordinarily weak, characterized by highly concentrated power and very little transparency, with a high incidence of corruption and nepotism. Human Rights Watch finds immense corruption and mismanagement of public revenues, while the impoverished population goes without essential public services (Human Rights Watch, 2010a). In the oil sector, other state institutions (notably the Ministry of Petroleum) have been unable or unwilling to hold Sonangol accountable. Industrial development is also weak, and private sector opportunities are largely dependent on social or familial connections to ruling elites. As such, Angola receives a mixed score of 3/5 in terms of clarity and accountability, with quite positive results in terms of clarity of roles, accurate collection of data and state audits of operators, but with a negative assessment of the state agencies' ability to hold operators accountable and to provide broader accountability to the public.

2. Ghana (1983 – 2011):

Like neighboring Sierra Leone and Liberia today, through the early 2000s there was no significant oil production in Ghana, leaving the state bodies responsible

for the sector to focus on overseeing exploration activity. When the Ghana National Petroleum Corporation (GNPC) was established in 1983, Ghana's capacity was extremely low, not just in the oil sector, but also across the public administration, in human resources and the private sector. The country was under military rule and was struggling with economic stagnation. The year 1983 marked the beginning of a period of comprehensive economic reforms (Aryeetey et al, Chapter 1).

In part because of the challenges in mobilizing adequate capacity to pursue the state's interests effectively, Ghana opted to concentrate power in the NOC. The Ministry of Energy is formally vested with various regulatory responsibilities, but in practice the ministry has relied heavily upon GNPC, "where the government's petroleum expertise is concentrated," to play the principal regulatory role, responsible for promoting the country's exploration potential, maintaining geophysical and geological data, leading the analysis of applications for licenses, and negotiating contracts (ISODEC and Oxfam, 2009).^x GNPC did not attempt to become an operator but rather focused on developing and managing relationships with the international companies that conducted the day-to-day technical work. After decades of largely unrewarding exploration, the discovery of the Jubilee field in 2007 by a consortium led by Tullow Oil fundamentally altered the picture. The field, estimated to hold more than 1.5 billion barrels of reserves, began producing oil in late 2010.

Development of the Jubilee field is largely attributable to fortuitous geology, but government strategy has played an important role in the sector's advancement to this stage. GNPC (and the ministry) formed partnerships with credible partners and, according to an analysis conducted for Oxfam America, negotiated contracts that offered a fair fiscal return to the state, given the level of geological risk that existed in Ghana at the time they were signed (Gary, 2012). The state's ability to monitor oil company activity and enforce the financial, technical and environmental obligations established in law and contract have yet to be conclusively demonstrated and will be significantly tested now that oil production has begun.

While Ghana has had some success on technical and economic matters (4/5), GNPC is weaker in terms of clarity of roles among the state bodies responsible for sector management and accountability to the state and society (2/5). The combination of formal vesting of regulatory power in the ministry and de facto power over many decisions in GNPC has created confusion and misunderstandings (Civil Society Platform on Oil and Gas, 2011, 7-8). GNPC does collect financial and operational data, which is audited by the auditor-general (UN, 2005).^{xi} But those audits have historically not been disclosed to the public. GNPC does not share information regularly with the population (Civil Society Platform on Oil and Gas, 2011).

During most of the company's history, this arrangement drew little scrutiny in Ghana, but the onset of production from Jubilee led many in Ghana to call for a restructuring of the sector and the establishment of an independent regulator, for several reasons.^{xii} First, as large oil revenues begin to flow for the first time (projected to reach more than \$1 billion annually at their peak) and new investors seek entry, the stakes have risen substantially, and the costs of corruption are seen to be much higher than during the exploration-only period.

Second, capacity has grown significantly in Ghana since the 1980s, particularly administrative capacity. Ghana now ranks in the 57th percentile of all countries worldwide on the World Bank's Government Effectiveness measure. The country has developed a history in the establishment of independent commissions that oversee the mining and power sectors, leading some Ghanaians to argue that the country is now at a stage from which this experience can be replicated in the oil sector.

Third, GNPC itself has announced plans to expand its focus on commercial activities and serve as an engine for the development of Ghanaian technical skill in the oil industry, which may increase the risk of conflict of interest if it retains its regulatory role. The company is unlikely to become an operator any time soon, but its priorities are shifting: GNPC's director of exploration and production recently stated that while previous government policies "restricted us to focusing on promotion," GNPC is now being given the opportunity to take "a dominant role in the industry" (Manu, 2009). This new emphasis was highlighted by the company's efforts in late 2010 to team up with the China National Offshore Oil Corporation (CNOOC) on a \$5 billion bid to buy out the Jubilee stakes of Kosmos Energy.

Government and citizen opinion on the benefits of independent regulation culminated in July 2011 with the passage of legislation establishing a petroleum commission responsible for the "regulation and the management" of petroleum resources, including the issuance of permits and the monitoring of petroleum activities, fiscal monitoring and health, safety and environmental standards. The act notably requires that within six months of its promulgation, GNPC is to "cease to exercise any advisory function in relation to the regulation and management" of petroleum (Government of Ghana, 2011). If this legislation is applied rigorously,^{xiii} it will move Ghana much closer to a separation-of-powers model.

3. Liberia (2000 – 2011):

Between 1970 and 1985, there was sporadic exploration off the coast of Liberia, with seven exploration wells producing no oil discoveries. In 2000, in the midst of the early stages of the second Liberian civil war, the government of Charles Taylor sought to reenergize the country's oil sector, both by embarking on a new seismic and exploration program and by creating the National Oil Company of Liberia (NOCAL) (TGS Nopec and NOCAL, 2010). At this time, the country's capacity was extraordinarily low—its percentile rank on the World Bank's

Government Effectiveness measure was 1.4—and human capacity had been devastated by conflict and instability.^{xiv}

The framework established in 2000 gives NOCAL formal power for “the administration, implementation, and enforcement” of the country’s petroleum law (Government of Liberia, 2000a, Section 4.1). This regulatory role explicitly includes the power to conduct licensing, set minimum financial obligations for companies, receive all data and documents from private contractors, approve unitization provisions when a deposit extends across more than one company’s license, impose “conditions of realization and development” on the operations and installations of contractors, and decide upon company requests for special financial incentives to invest (Government of Liberia, 2000a, 2000b). This formal grant of regulatory power has been borne out in practice, with NOCAL exerting day-to-day control over practically all elements of Liberia’s exploration program, from licensing (in which it has developed terms of reference and administered bid rounds), to contract negotiations (where it has chaired the relevant interagency body), to enforcement of companies’ contractual obligations (Global Witness, 2011).

By the end of 2011, Liberia’s exploration efforts did not produced any petroleum discoveries.^{xv} This cannot be attributed exclusively to any elements of the country’s sector management, geology obviously being the most important determinant of exploration success. But NOCAL’s stewardship of the sector has not helped spur consistent exploration efforts; the company licensed significant chunks of the offshore acreage to companies like Broadway and Oranto with limited technical and financial capabilities and little history of success. The country went more than 25 years without a single well being drilled (Global Witness, 2011). In recent years Liberia has brought in players with better records of exploration success, including Anadarko and Chevron (which, after farming three blocks, announced in 2011 plans to invest billions in Liberian exploration). A licensing round conducted in 2009-10 amidst a frenzy of interest following discoveries in Sierra Leone and Ghana attracted bids from StatoilHydro and Repsol. But as of the writing of this article, more than a year has passed since the submission of bids, without any decision announced on how to move forward. We give Liberia a score of 2/5 on technical/economic performance, because the company has developed contracts with some reputable players that seem to be investing meaningfully in exploration recently, but the results have been fragmented and inconsistent.

From an accountability perspective, Liberia’s results have been mixed. There appears to be dissatisfaction within the government over the role that NOCAL has played and its accountability to the Ministry of Lands, Mines, and Energy and the rest of the executive. When this article was going to press, the Liberian government has begun a process to develop a petroleum policy and revise the legal framework for the sector, and NOCAL’s role in the future represents a key

area of debate, both within the Liberian government and among other stakeholders (Sieh, 2011; Morris, 2010; Global Witness, 2011).

In terms of accountability to the public, Liberia was the second country in the world to be validated as EITI-compliant, when it passed a groundbreaking EITI act enshrining key transparency provisions. It publishes all of the country's oil contracts online and had the highest score of 14 sub-Saharan African countries ranked in the 2010 Revenue Watch Index of extractive industry transparency.^{xvi} But the focus of EITI and the index rankings in Liberia were overwhelmingly on mineral and timber concessions, and the oil industry has been subjected to relatively little scrutiny. A 2011 report on NOCAL by the national auditor general revealed serious inadequacies in NOCAL's record-keeping related to its management of revenues generated by contracts with private companies. The investigation also uncovered evidence of nearly \$120,000 in unjustified payments from NOCAL to the Liberian legislature in "lobbying fees" that the report characterizes as illegal bribery (Morlu, 2011). We give Liberia a score of 3 out of 5 on accountability, because its relatively high level of information disclosure to the public is offset by poor intragovernmental coordination and accusations of corruption.

4. Brazil (1954 -1997):

Advocates of the separation-of-powers model sometimes cite Brazil as an example of a country that uses it successfully. But governments in new oil hotspots should recall that Brazil implemented the model only in the late 1990s, after developing the oil sector under a NOC-dominated system. Petrobras was far and away the dominant player in Brazil's oil industry until 1997.

When Petrobras was created in 1954, Brazil had little expertise in oil-sector management and an unimpressive resource base. Brazil had a relatively strong cadre of skilled and well-educated citizens (though overall national human capacity was low), but administrative capacity under a series of military-dominated governments was limited. Before the Petrobras's founding, oil regulation was managed by the National Petroleum Council (CNP), with poor results. The government elected to give Petrobras a monopoly over upstream and downstream oil operations in Brazil, and throughout the 1950s and 1960s the company gained an increasingly powerful, autonomous role in setting policy and regulation. The company's independence expanded further under the leadership of General Ernesto Geisel, who became president of the company in 1968. He insisted that Petrobras largely be left alone by the Ministry of Mines and Energy and be allowed to focus on developing its skills and expertise, particularly in deepwater operations. Petrobras was protected by the state and was allowed to develop as an effective unit amid several successive governments that were viewed by the citizenry with significantly more skepticism (de Oliveira, 2012).

Petrobras's technical success continued to grow in the 1970s as the company moved into deeper and deeper waters, expanding Brazilian production and

developing a type of expertise unknown even to many of the company's private-sector IOC partners. While the company's downstream activities were not nearly as efficient, de Oliveira concludes that Petrobras "visibly delivered on the government's central goals of providing a secure oil supply while saving scarce hard currencies and supporting the country's broader industrialization" (2012). These successes occurred within an overall context of economic struggle under military rule in the 1970s and 1980s. The decision by the government to entrust the company's technocrats with significant leeway to build expertise was a central component of this success and of Petrobras's development into a world-class oil company.

With the return of democratic rule in the late 1980s, pressure grew to remove the company's monopoly, introduce competition, and increase the transparency of the sector. This culminated in the mid-1990s with the decision to eliminate the company's monopoly and introduce competition in the award of oil blocs. In 1997, Brazil introduced a formal separation of powers with the creation of the National Petroleum Agency (ANP).

At the time that the separation-of-powers model was introduced in Brazil, the country had already developed both its oil sector and administrative capacity. Brazil ranked in the 48th percentile globally in the World Bank Government Effectiveness rankings (in 1996) (see Table 1 below). Sectoral capacity was high (5/5 in our assessment), since Petrobras was able to operate to a high standard. Human capacity had increased as well, with the average of tertiary and secondary enrolment and quality of scientific research institutions reaching the 27th percentile globally (WEF, 2002-03).

Brazil was able to travel a good distance with the NOC-dominated model, until the government perceived shortcomings that led it to create stronger checks and balances. In this sense, there are parallels to Ghana's situation today, wherein GNPC has been charged with stewardship of the sector through a preliminary stage but where many suggest that administrative capacity has reached a high enough level that a separation-of-powers model could now be instituted successfully.

Brazil also presents some interesting contrasts with Algeria, another country where attempts were made to introduce a separation of powers after a period of NOC domination. In Brazil during the period of NOC control, other institutions and the economy as a whole developed significantly, creating conditions that enabled a separation-of-powers model to function effectively. In Algeria, by contrast, when the attempt to separate power began in 2005, other institutions had not progressed as far (see Table 1 below). Also, Brazil had become a functioning democracy by 1997, and the decision to remove regulatory powers from Petrobras was imbued with popular legitimacy. In Algeria, the reform was controversial and attracted wide opposition. Many executives of the Algerian

NOC, Sonatrach, saw the reform effort as a government refutation of their accomplishments (Marcel, 2006, 92-96).

Table 1: Comparative Governance Indicators for Brazil, Algeria and Ghana at the Time of their Respective Transition to a Separation-of-Powers Model

Country	Government Effectiveness (Governance Score -2.5 to +2.5)	Control of Corruption	Regulatory Quality ^{xvii}
Brazil 1996	-0.15	-0.07	+0.41
Algeria 2005	-0.42	-0.42	-0.43
Ghana 2010 (most recent data available)	-0.01	+0.09	+0.09

Source: Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi, "Worldwide Governance Indicators: Methodology and Analytical Issues," World Bank Working Paper 5430, 2010.

B. Ministry-Dominated Systems

In the ministry-dominated model, the government plays a preeminent role in most, if not all, of the following areas: policymaking, making strategy for the NOC, and allocating capital budgets to the NOC and regulating and monitoring companies. Trinidad and Tobago is a good illustration of the model's successful application. The government of Trinidad and Tobago has concentrated oversight power in the Ministry of Energy and Energy Affairs. The country has fully state-owned companies in the upstream oil sector (Petrotrin) and natural gas sector (National Gas Co. of Trinidad and Tobago), but these companies play a predominantly commercial role and do not have broad sector management or oversight responsibilities. It is a successful case in terms of maximizing financial benefits, building local industry and accountability; but significantly, the model was introduced when state administrative capacity was already ranked medium globally. Other leading examples of ministry-dominated systems have no NOC at all.

1. Gabon (1960 – 2010):

Long Africa's third-largest oil producer before being overtaken by Equatorial Guinea, Gabon has for much of its history managed its oil sector without a national oil company. Upon the country's independence in 1960, exploration and exploitation were dominated by the French-controlled Société des Pétroles de l'Afrique Équatoriale, which eventually spun into Elf-Gabon. After its accession to the Organization of Oil Exporting Countries (OPEC), the Gabonese state took over a 25 percent stake in Elf-Gabon, and eventually an additional 17 percent came to be controlled by private Gabonese citizens with close ties to the country's ruling elite (Pourtier, 1989; Soares de Oliveira, 2007b).

Rather than seeking a strong technical role in the development of the industry, Gabon's government decided to pursue benefits from oil overwhelmingly via fiscal revenue flows, and to leave operations in the hands of the French partners, with which Gabon's rulers retained extremely close relationships. Day-to-day oversight of the state's interests have been led by the Ministry of Mines, Petroleum and Hydrocarbons, whose National Hydrocarbons Directorate possessed most regulatory powers. In practice, control over state oil mechanisms lay very much in the hands of President Omar Bongo and his circle of advisors and confidants. The foreign oil companies led all significant technical decisions, with Gabonese actors possessing very little capacity in oil-sector management (ranking a 1 on our 5-point scale). The state did create an NOC, Petrogab, in 1979 as the holder of the state's interests, but in the face of the powerful roles accorded to the presidency, the ministry and Elf-Gabon, the company did not play a useful role, and by the late 1980s it was dissolved (Soares de Oliveira, 2007b).

For several decades, Gabon's oil bounty provided a steady stream of income, which supported the needs of the country's elites and pushed Gabon's per capita GDP to more than \$7,000, making it one of the richest countries in Africa by that measure. In a context of plentiful resources and relatively low production costs, Gabon negotiated contracts that projected a government take estimated to be roughly in the middle of the pack of global oil producers, though lower than African counterparts such as Angola and Nigeria with larger reserves (Johnston, 2006).^{xviii} Still, the government's economic and technical management of the sector is not an unequivocal success. The country has not attracted sufficient investment or generated sufficient dynamism among knowledgeable players to prevent a steady decline in production and a lack of development of sizable new fields (Africa Energy Intelligence, 2010). By 2008, production had declined more than 35 percent from its peak of 365,000 barrels per day in 1996, and the country has not generated promising new finds to reverse the trend. Gabon has done little to capitalize on the oil industry to develop a dynamic private sector or highly skilled class of technocrats that will serve it well as its economy evolves (Pourtier, 1989). As a result, Gabon scores 3/5 in terms of economic and technical performance of the oil sector.

Analysts have asserted that the concentration of oil-sector decision-making in the hands of a highly politicized elite created an environment in which personal interests rather than long-term public economic goals took precedence, and in which innovation was not prioritized (Soares de Oliveira, 2007b). Certainly Gabon has not succeeded in making the oil sector accountable to the public; the financial benefits from the sector are highly concentrated, and the country has been the site of some of the world's most notorious incidents of oil-fueled bribery and corruption.^{xix} Even within the government, "relations between the oil companies and various government institutions lack coordination and clarity," with revenue flows among the ministry, the treasury, the tax collecting

department and the customs department far from clear (International Monetary Fund or IMF, 2006, 13). As such, our evaluation of Gabon's success on clarity and accountability is 1/5, the lowest score.

In 2010, Ali Bongo, who rose to the Gabonese presidency after his father's death, announced his intention to create a new national oil company to manage the state's share of oil ventures, award licenses, and stimulate new investment in deepwater acreage. It remains to be seen whether this proposed NOC-dominated structure would enhance either economic performance or accountability. To date, it appears that the absence of an NOC (or a strong one) has not been the cause of governance failures in Gabon. Rather, these are largely attributable to sloppy accountability processes and a weak culture and capacity of civil administration.

2. Democratic Republic of Congo (2006 – 2011):

Years of violent conflict in DRC have gutted infrastructure and retarded the development of public institutions, while the population suffers from major public health problems. DRC is at the bottom of administrative and human capacity rankings: 2nd percentile in the World Bank Governance Effectiveness index and 13th in the Ibrahim Index of Human Capital on the African continent. Sectoral capacity is also very low (1/5 in our assessment), with legislators struggling to devise stable investment terms.

Following the oil finds on Uganda's side of Lake Albert beginning in 2006, explorers were keen to try their luck in DRC. However, license negotiation and exploration programs have been very slow. Petroleum sector management is dominated—at least in principle—by the Ministry of Hydrocarbons, which is responsible for licensing and policymaking. In fact, the ministry is still a new institution (created in 2007), and other state actors are active in the licensing and policymaking areas. President Joseph Kabila has made use of his prerogative to ratify contracts; in the instance of Tullow Oil's exploration and development program for the Albert Basin blocks, he withheld ratification for years and stripped Tullow of its license in late June 2010. The licenses were granted instead to companies owned by a relative of South Africa's president. As such, DRC illustrates the ministry-dominated model's risks of executive interference and a failure to empower technocrats.

Also weakening the ministry's institutional power is the legislature, which plays a policymaking role. The Assembly is now considering a hydrocarbons bill prepared by the Senate. The bill is the object of heated debates. The Minister of Hydrocarbons was invited to contribute but did not draft the bill. The bill proposes to create a new NOC for the upstream, Petroco, leaving the existing NOC, Cohydro, to handle the downstream. The bill also proposes a minimum stake for Petroco, contrary to the wishes of many government experts. Moreover, the experts had recommended that Petroco should take on the role of concessionaire, like Sonangol, but senators disagreed.^{xx} As Christian Kanku,

director of legislation at the Ministry of Hydrocarbons explained, legislators are wary of creating a company whose financial strength could make it difficult for the state to control.

In addition to poor technical and economic performance, the petroleum industry in DRC has been characterized by a low level of accountability, with a lack of clarity of roles and responsibilities among the institutions and little transparency about the sector. It receives our lowest score for clarity and accountability (1/5). The introduction of a national oil company into the governance system is unlikely to resolve the pressing problem of lack of clarity concerning the management of the sector.

3. Sierra Leone (2001 – 2011):

Like DRC, Sierra Leone is a conflict-affected country that is trying to develop its oil sector in the face of some of the most serious capacity challenges in the world. The Ibrahim Index ranks Sierra Leone 49th out of 53 African countries in terms of health, welfare and education and 37th for providing an enabling framework for the creation of economic wealth. The country also ranks in the bottom 10 percent of all countries globally on the World Bank's Government Effectiveness measure. Sectoral capacity is also low (1/5) with a tiny cadre of petroleum professionals and low level of training within the public administration about the commercial and operational requirements of the sector.

The potentially commercial Venus discovery made offshore in 2009 attracted oil company interest in new licenses, as did the major finds made nearby off the coast of Ghana. But, even though Sierra Leone has a long history of mining, its institutional setup for governing the petroleum sector is still nascent. There are ongoing efforts to build the capacity of relevant institutions in readiness for the emerging oil and gas sector (Revenue Watch Institute, 2010b). However, the absence of a clear legislative and institutional framework created significant obstacles to the effective evolution of the sector.

The Petroleum Resource Unit (PRU), which initially focused on petroleum product storage and distribution, was given a new mandate in 2001 to serve as the industry regulator and to handle licensing for the petroleum sector. Though the PRU was not formally a ministry, it functioned as an independent unit at a quasi-cabinet level, and its director reported directly to the president of the country. In practice, the PRU oversaw all elements of the sector, from the award of licenses to the negotiation of agreements to the approval of work plans to the monitoring of company activities and payments. Before the discovery of the Venus field, there had never been a significant petroleum discovery in Sierra Leone, so the focus of the PRU's monitoring efforts was on promoting the country, licensing out its offshore acreage, and supervising the efforts of exploration companies. Oversight of the PRU was relatively informal; the law gives the PRU large amounts of discretion to manage the sector as it sees fit and makes it solely accountable to the president without a formal process.

The PRU struggled to effectively oversee the sector and enforce the legal and contractual obligations of foreign companies. Prior to the Venus discovery by a consortium led by Anadarko, the contracts that the government had awarded had yielded few results. This was partially a result of geology but was also linked to the award of many blocks to speculator companies with little experience in effective exploration (including companies such as Frazimex, #8 Investment, African Petroleum and Young Energy Prize) and to a regulatory environment in which exploration companies were continually able to delay making significant investments. For this reason, Sierra Leone scores a low 1/5 on our ranking of economic and technical performance. However, with the discovery of oil at Venus, the priorities of Sierra Leone are shifting, and the need for improved monitoring capacity will grow as the field is tested for commerciality.

Beyond the technical and economic challenges, the government and the PRU were criticized for a lack of accountability in the oil sector. Contracts were negotiated and managed in secret, and information-sharing with Parliament, other ministries and the public has been scant. Raymond Kargbo, who worked as a petroleum geologist and petroscientist in the PRU,^{xxi} indicates that the unit suffered significantly from weak oversight. He explained, “The president [did] not have time to assess [all the things we brought to him]. He [did] not have time to supervise the PRU. There [was] no board, no committee above us [to supervise us].”^{xxii} On clarity and accountability, Sierra Leone achieved low levels of success during the PRU period (1/5 on our scale), one of the major reasons that the government launched a policy and legal reform process.

In July 2011, Sierra Leone’s government passed a new Petroleum Exploration and Production Act that affirms the principles of increasing accountability mechanisms and transparency in the sector. It requires all license awards to be based on open tenders, requires publication of licenses, and calls for more extensive reporting to Parliament. The act seeks to move Sierra Leone toward a separation-of-powers model, by housing policymaking powers in the ministry, creating a directorate responsible for regulation, and calling for the establishment of a Sierra Leone national petroleum company with a commercial orientation. The degree to which the act results in a genuine separation of powers remains to be seen. The act leaves decision-making power on the award of licenses, approval of work plans, and other key areas of oversight with the ministry, leaving the directorate in an advisory role (Government of Sierra Leone, 2011). Regulations that were not yet in place when we wrote this article will go a long way toward determining whether the Sierra Leonean system evolves toward a separation-of-powers paradigm or remains inherently ministry-dominated.

4. Uganda (1985 – 2011):

Since the advent of the current legal framework for petroleum management in 1985, regulation of the sector in Uganda has been dominated by the Petroleum Exploration and Production Department (PEPD), a unit under the Ministry of

Energy and Mineral Development. In 1985 Uganda under Milton Obote was in the throes of a long period of conflict and large-scale human rights violations that started with Idi Amin, and the war that would ultimately bring Yoweri Museveni to power was entering its final stages. In 1985, infant mortality was more than 10 percent, and by 1986 the country's secondary school enrollment rate was 10 percent (World Bank, 2011b). Administrative capacity was similarly stunted by the long period of violence and the militarization of the civil service. By 1986, "state regulatory structures had collapsed; many of the best-educated people had been killed or were driven away; [and] civil service hardly functioned," (Rugumamu and Gbla, 2003). Oil sector capacity was also extremely low. Though there had been some (unsuccessful) exploration activity, a 1985 World Bank assessment found that "the turmoil of the 1970s made it difficult for the [petroleum-sector] professionals to keep in touch with ... developments worldwide," and that "much of the physical infrastructure, including vehicles, laboratory, and office equipment, was destroyed" (World Bank, 1985, 17). As such, we assign Uganda a ranking of 1/5 on all three measures of capacity.

The legislative framework empowered the PEPD to perform the regulatory functions associated with the country's exploration program and eventual production, including geological data management, licensing and monitoring of IOC activity. The government concentrated extensive resources in the development of PEPD's skills and capacities, including via an extensive program of training organized by the Norwegian government. The interest in oil exploration in Uganda intensified in the 2000s, with more than 30 wells drilled by the country's contractors between 2002 and 2010 (Uganda Ministry of Energy and Mineral Development, 2010). The government's partnership with midsize oil companies Tullow and Heritage paid off in 2006 with the confirmation of commercially exploitable reserves at Lake Albert. As with other discoveries, the success of this exploration program should be principally attributed to geology, but the government's concerted push for aggressive exploration by competent partners appears to have made a meaningful contribution. Opinions on whether the Ugandan government negotiated a good deal with its IOC partners vary. Some NGOs have charged that the projected government take places Uganda well below peer countries, while a U.S. oil and gas lawyer who analyzed the agreements has argued that Uganda's projected take is well in line with international norms (Platform, 2010; Kisambira and Muhumuza, 2009). We give Uganda an economic and technical performance score of 3/5.

The PEPD-dominated model seems to have generated sufficient intragovernmental clarity and accountability to reach an intermediate level of exploration success. But like in Ghana, as the country nears oil production, actors both inside and outside the government have called for a shift to a separation-of-powers model. The ministry has asserted that there is a need for a more sophisticated system of management to handle oil production, and a U.S. government assessment highlighted the need to improve interministerial information flow now that oil is poised to become a more significant revenue

generator (Uganda Ministry of Energy and Mineral Development, 2010, 13–14; USAID, 2010). The push for institutional reform has been bolstered by charges that Ugandan management has not been accountable to the citizenry, with poor management of public expectations and the use of oil-related contracts as instruments of patronage favoring the president's family (Global Witness, 2010). Because Uganda has combined moderately good internal accountability with weak public accountability, we assign a score of 3/5 on the clarity/accountability measure. The Ugandan government has approved a new oil policy, and is debating legislation that would create an NOC to handle commercial functions, assign regulatory functions to a petroleum authority, and house policymaking functions within an upstream petroleum department. It will be interesting to follow the development of this attempt at separation of powers to see whether it takes root and alters Uganda's oil development path.

C. Separation-of-Powers Model

The case of Norway, which has separated functions in the oil and gas sector among the Ministry of Energy, NOC and regulatory agency, is well known. Norway is, of course, a high-capacity producer in terms of institutional, human and industrial capacity, as were countries like Brazil at the stage when they implemented the Norwegian model. This section examines the experience of several low-capacity countries that have implemented (or attempted to implement) a version of the separation-of-powers model.

1. Mozambique (1992 – 2011):

Just as Mozambique emerged from a civil war that had started shortly after independence in 1977 and ended only in 1992, the Joaquim Chissano government moved to establish a regulatory agency, DNCH (precursor to today's National Institute of Petroleum, INP). The NOC Empresa Nacional de Hidrocarbonetos's (ENH) purely commercial role was established in 1998. While the war had decimated institutions, economy and infrastructure, in 1990 the Chissano government enacted a new constitution that introduced a multiparty political system and a market-based economy. By 1996, the first year for which the World Bank's government effectiveness ranking is available, those efforts seemed to have succeeded with the country ranking in the 54th percentile worldwide. It still faced capacity challenges, most notably in terms of human capital, in which it continues to rank poorly to this day (the WEF ranked it 138th out of 139 countries, and the Ibrahim Index ranked it 40th out of 53 African countries).

Today the INP acts as the regulator in charge of licensing and monitoring operations, the Ministry of Mineral Resources and Energy is focused on policymaking, and the NOC strives to build technical capacity through its 15 to 25 percent equity participation in various operating groups. On the relationships among these entities, ENH Exploration Manager Tavares Martinho described a system free from institutional competition, commenting, "There is no fighting between us. We work together."^{xxiii}

The institutional setup was already in place when Anadarko Petroleum discovered the giant Windjammer natural gas field offshore in 2010 (in contrast to Uganda and Ghana, which had less elaborate petroleum institutions at the time of their major discoveries). The Mozambican discovery has opened up a new deepwater exploration play, even without results on the commerciality of the find. Mozambique's acreage has attracted companies with greater means than those engaged in Sierra Leone and DRC (e.g., ENI, Petronas and Statoil), and these companies are investing sizable amounts of exploration money and mounting major drilling programs.

Mozambique has received substantial Norwegian petroleum-related assistance since 1983 (in fact, it is the largest recipient of such aid), as well as World Bank support and other multilateral and bilateral aid, which has helped it set up a well-functioning institutional and legal framework for the industry. According to the 2007 Norwegian Agency for Development Cooperation's (Norad) evaluation of its assistance, the level of success achieved in the Mozambican program stands in contrast to other countries involved: the INP and ENH acquired good knowledge of potential petroleum resources through acquisition and interpretation of seismic data. Training programs have succeeded in building competencies in both the INP and ENH. In Norad's assessment, INP is a well-established, lean organization with solid competencies, sufficient sources of income and freedom for management.

ENH's financial situation, however, is poor. It is not able to meet its financial obligations in its equity stakes, in spite of streamlining efforts.^{xxiv} These financial straits prevent ENH from offering performance incentives to staff, while the INP is able to provide them. This may lead to ENH staff leaving the company for more attractive employers (notably IOCs in Mozambique). Moreover, ENH's effectiveness in negotiating new contracts may be hindered by the fact that its access to seismic and other data is now limited. The NOC is still low capacity and not operating. Economic and technical performance in Mozambique is high (with the notable exception being the limitations in NOC capacity building), and we give it a 4/5 score.

In terms of clarity and accountability, Mozambique made some strides in intragovernmental relationships. The Norad evaluation finds monitoring systems adequate. However, petroleum competencies remain unsatisfactory in the Ministry of Co-ordination and Environment and the Ministry of Resources, Minerals and Energy (Norad, 2007),^{xxv} which may limit the effectiveness of monitoring systems. In terms of accountability to the public, several deficiencies remain. Public finances remain largely opaque to the public, with the International Budget Partnership making the assessment that Mozambique "provides minimal information to the public in its budget documents" (2010) and explaining that the government has not been proactive in circulating budget information to the public in a timely manner or in a format that is capable of comprehension by nonexperts

(Lawson et al, 2006, 25). Mozambique is an EITI candidate country and has published a first EITI report, but its civil society has charged that the process has been shallow and that discrepancies identified have been poorly explained (Centro de Integridade Pública, 2011). Since Mozambique has achieved partial but incomplete success both in terms of internal and public accountability, we give it a score of 3/5.

Decisive factors in the relative success of the separation of powers set up in Mozambique were the sustained, significant capacity-building efforts on the part of Norway and the World Bank, as well as the high level of commitment in Mozambique to the agreed training and development program. In contrast, by Norad's own assessment, Norwegian assistance to Angola was not successful because of the lack of such commitment on the part of the Ministry of Petroleum, and because the Ministry is the weaker player in the sector (compared with Sonangol, in which capacity is concentrated). Also, in Mozambique, Norwegian assistance began well before the recent surge of exploration interest in the country, whereas similar assistance in well-established producers with strong investor interest and established institutions with spheres of influence to defend will not have as much impact (as was the case in Angola).

2. Timor Leste (2002 – 2011):

Timor-Leste is another country where Norwegian assistance has supported the establishment of a separation-of-powers model. The country began producing oil in 2004, and current production is at roughly 100,000 barrels per day. The country has several projects at various stages of development, and foreign companies are exploring for new prospects in Timor's waters. Production currently is from the gas-condensate Bayu-Undan field in the Joint Petroleum Development Area with Australia.

As one of the world's newest states, with a recent history of intense conflict, Timor-Leste faces huge capacity constraints. It nears the bottom of the World Economic Forum's global rankings for higher education and training (130/139), and the adult illiteracy rate is 40 percent (IMF, 2005, 7). There are very few educated people, and it is difficult for companies and assistance programs to find counterparts that have the relevant basic training necessary to take highly specialized positions in the sector. Administrative capacity is also low (in the 23rd percentile in the 2002 World Bank government effectiveness index), and state institutions are unable to execute their budgets.^{xxvi} As a result, Timor-Leste is likely to remain dependent on foreign advisers and technical assistance for a long time (Norad, 2007, 21-22).

The energy sector is new, and institutions and rules are being created from scratch. Timor has received petroleum assistance from Norad since 2002. The government established a new regulator, the National Petroleum Authority (ANP), which is responsible to the Secretaria de Estados dos Recursos Naturais or SERN (an equivalent of a ministry of energy). The Norad evaluation of

petroleum-related assistance found in 2007 that rules and regulations were functioning for various tasks, such as licensing and the use of petroleum revenue. However, more effort was needed in the area of regulation (Norad, 2007, 21-22). Large efforts are also required to develop capabilities, skills and institutional processes. In terms of economic and technical performance, Timor-Leste gets a 3/5 score, with good marks for laying out a regulatory and fiscal framework for investment and lower marks in building capacity in the sector, especially in building skills and expertise beyond the tiny cadre of decision-makers.

Many international advisors recommend that Timor-Leste refrain from creating an NOC because of the country's uncertain reserves base. Nevertheless, the idea to create a company was adopted. As of the writing of this paper, Timor-Leste had not yet established a national oil company, though over the course of 2010 and 2011 the government was developing plans to create a company that would represent the state in partnerships with foreign companies through a minority-carried stake. The SERN is holding regular public consultations on these plans.

It is too early to fully assess the government's plans for the creation of an NOC. The focus of institutional design efforts in Timor-Leste is to establish strong institutions that can keep a firm grip on the NOC and avoid corruption. In practice, power over the sector is concentrated in the hands of a few individuals, even though governance of the sector is formally based on the separation of functions across three entities. As a result, other state institutions that could potentially play a role in decision-making or accountability processes are too weak or do not hold sufficient industry expertise to do so effectively. The accountability of the SERN is limited to the Council of Ministers. There are also serious risks that without the heavy technical assistance the government is currently receiving, its capacity to oversee the work of foreign operators will be extremely weak (Marcel, 2011). Timor-Leste's score on clarity and accountability is therefore mixed (3/5), with clear successes in transparency, reporting and public consultations, but poor results in terms of the involvement of state agencies and the legislature in these processes and of the capacity of the latter to effectively control operators and the SERN.

The Timorese system, which has ostensibly been designed as a separation-of-powers model, is likely to end up looking more like a ministry-dominated model (Marcel, 2011). This result may satisfy the Timorese in terms of governance because of the high level of public trust in government. Indeed, an interesting feature of the Timorese political landscape performs relatively well in the World Economic Forum's ranking of public trust in politicians, ranking 52nd out of 139 countries surveyed (Schwab, 2010). This trust has been enhanced by the country's high level of transparency in petroleum-sector transparency. Like Liberia, Timor-Leste was an early and vigorous participant in the EITI process, becoming the third country in the world to be validated as compliant with the initiative, and makes all of its oil agreements available online. Timor-Leste was

one of 12 countries in the world rated to provide “Comprehensive Revenue Transparency” on the Revenue Watch Index (Revenue Watch Institute, 2010a).

3. São Tomé e Príncipe (2003 – 2011):

São Tomé e Príncipe (STP) are two tiny islands in the Gulf of Guinea, and they share territorial waters with a much more powerful neighbor, Nigeria. STP has been classified as one of the least developed countries by the United Nations since 1982 and ranked in the 30th percentile in government effectiveness at the time of its major oil licensing in 2003. In the joint development zone with Nigeria, exploration efforts have yielded some discoveries, but none with confirmed commerciality. The first licensing round for STP’s own offshore area, the EEZ, was held in 2010.

The model in STP is very similar to Timor-Leste’s, with a formal separation of powers but a yet-to-be-established NOC. While the government had initially planned to follow the Angolan model with an NOC responsible for licensing (the STP NOC was created on paper in 2001 with this model in mind), it was advised by the World Bank, Norway and various consultants to separate the regulatory, policy and operating functions in three different entities.^{xxvii} The Agência Nacional do Petróleo de São Tomé e Príncipe was established in 2004 as the regulatory and licensing agency of the EEZ. It is responsible to the Ministry of Natural Resources and Environment.

The government’s commitment to higher governance standards is weaker than in Timor-Leste, and as a result, STP was dropped from the EITI’s list of candidate countries in April 2010. The government received international assistance to set the legal and regulatory framework of the oil sector, notably for the transparent management of oil revenues. However, these programs have largely been short-term: the Norwegian Petroleum Directorate assistance project lasted from 2008 to 2009, and the World Bank’s program to support petroleum governance included several projects between 2006 and 2009 that are now closed (World Bank, 2005). HRW judges that the government does not have the political will or the institutional capacity to follow through on reform and notes that it has not published financial data as set out in laws and regulations. STP therefore scores poorly in clarity and accountability with a 2/5.

Moreover, in terms of technical and economic performance, previous licensing rounds have not met international or São Toméan standards. The state take was inappropriately low, awards were made to under-qualified firms, and there were allegations of deals being subject to political manipulation from Nigeria.^{xxviii} For the 2010 licensing round in the EEZ, STP’s prime minister announced in September that African firms would be given preference. Firms with political connections in Nigeria and Angola dominated the list of bidders. As a result, STP scored a low 1/5 in technical and economic performance.

4. Nigeria (various intervals in 1971-2011 period):

Nigeria illustrates the difficulty that the separation-of-powers model can have in taking hold in countries with low capacity. Throughout its history as an oil-producing state, Nigeria has fluctuated between ministry- or NOC-dominated systems. The country had previously set up independent regulators during three separate periods: from 1971 to 1977, the late 1980s (ending in 1988), and from 1999 until today. During each of these periods, the regulatory body has struggled to wrest effective control of critical oversight functions from powerful interests in the Nigerian National Petroleum Co. (NNPC) and the presidency, and the country's oil sector have remained opaque and inefficient. When regulatory bodies have had any influence at all, they have served as additional transaction points at which petty corruption is multiplied. Despite any good intentions of the institutional designers, creating nominally autonomous regulators in Nigeria has failed to curb the power of the vested interests in the sector or to transform it into something other than a vehicle for patronage. Through a web of subsidiaries, NNPC has a hand in virtually all elements of the petroleum industry, including upstream joint ventures, oversight and cost control, marketing and refining, and it has used its influence to reinforce maintain patronage networks at the expense of efficiency and transparency.

Nigeria has been able to work with international partners to produce a steady flow of oil that has delivered massive revenues to the state and dominated the national economy. But despite the large revenue flows, the government cannot be considered to be a fully successful manager of its endowment. The sector has been beset with delays, violence and production shutdowns that have resulted in disappointing revenues. For these reasons, we give Nigeria a rank of 2/5 on the scale of success in technical and economic performance.

The picture is no brighter in terms of accountability and clarity of roles. Despite the rise of some highly skilled individuals, NNPC has failed to develop effectively, either as a commercial agent or as a quasi-regulator, and routinely has trouble meeting its cash calls as part of joint ventures with IOCs. Monitoring and oversight have been weak, contributing to frequent environmental disasters and deep resentment against the oil industry in producing regions (Thurber, Emelife and Heller, 2010). Nigeria has taken several important steps to advance the oil sector's transparency, including the publication of very detailed reports on oil-sector revenues and processes through its participation in EITI and publication of subnational revenue flows, and has a vigorous independent press and civil society that scrutinize the oil industry heavily. But these initiatives have yet to promote a flourishing of accountability in the management of the sector. We give Nigeria a clarity and accountability score of 2/5.

The weaknesses in the Nigerian oil sector prompted officials working under presidents Olusegun Obasanjo and Umaru Yar'Adua to develop a new omnibus Petroleum Industry Bill, whose reintroduction the new government of Goodluck Jonathan is believed to be considering at the time this paper was written. Previous versions of the bill sought to strip NNPC of many of its regulatory

responsibilities, require the company to become more commercially competitive, raise capital independently, and once again seek to build the capacity and authority of an independent regulator.

Nigeria's administrative capacity remains very low, in the 9th and 13th percentiles globally according to the World Bank and World Economic Forum indexes, respectively. Its human capacity ranking in percentile terms today is also very low at 15th for higher education and training (WEF, 2010). In our assessment, sector capacity is medium (3/5) because the NOC and state agencies have an established set of skills and knowledge about the sector, though not at a level similar to Petrobras or Sonatrach.

IV. COMPARATIVE ASSESSMENT OF PERFORMANCE AND GOVERNANCE

The following table summarizes our results, covering 11 of the 12 cases we describe in detail in this article (leaving out Nigeria, where the fluctuation among different systems defies ready categorization), plus four additional historical cases that provide valuable illustrations. For each case, the table shows the governance design adopted by each country, its capacity at the time of that choice of design, and the success achieved today (or at the end of the time period for that design). The capacity scores are based on comparable data sets whenever possible, as described in Section II. As described in Section I and Box 1, the 5-point scale is not meant to indicate precise measurements, but rather indicates relative capacity and success in a global context.

Table 2: Summary of Capacity and Success for All Cases^{xxix}
(Note: 1 = lowest; 5 = highest)

Country	Governance Design	Administrative Capacity (1-5 rank)	Human Capacity (1-5 rank)	Sector Capacity (1-5 rank)	Success: Accountability/ Clarity (1-5 rank, 2011 unless noted)	Success: Technical/Economic (1-5 rank, 2011 unless noted)
Democratic Republic of Congo 2006	Ministry-Led	1	1	1	1	1
Sierra Leone 2001	Ministry-Led	1	1	1	1	1
Gabon 1960	Ministry-Led	1	1	1	1	3
Uganda 1985	Ministry-Led	1	1	1	3	3
Liberia 2000	NOC-Led	1	1	1	3	2
Angola 1976	NOC-Led	1	1	1	3	4
Indonesia 1968	NOC-Led	1	2	2	(2001) 1	(2001) 3
Ghana 1983	NOC-Led	2	2	1	2	4
Malaysia 1974	NOC-Led	2	4	2	3	5
Brazil 1954 ^{xxx}	NOC-Led	3	2	2	(1997) 3	(1997) 5
São Tomé e Príncipe 2003	Separation	2	1	1	2	1
Timor-Leste 2002	Separation	2	1	1	3	3
Mozambique 1992	Separation	2	1	1	3	4
Indonesia 2001	Separation	2	2	3	4	3
Algeria 2005	Separation	2	2	5	4	4

Our analysis has shown the importance of individual national contexts in explaining the degree of success of various models. Nevertheless, comparative analysis does reveal some trends, which allows us to put forward findings that may help policymakers in capacity-challenged oil hotspots think critically about the best structures for their situations.

1. *Low-capacity countries have a stronger history of technical and economic success when resources are concentrated in the NOC, rather than rigidly separated across distinct administrative bodies.*

In our most prominent examples of long-term success in building sectoral expertise, generating strong financial returns to the state, and enforcing rules effectively—including Brazil, Angola and Ghana—governments decided at an early stage to concentrate power and resources in a national oil company. The NOC-dominant model was also followed in Malaysia, where the NOC Petronas wrapped the roles of company, regulator and policymaker all into one and achieved high levels of technical success. Uganda does not have an NOC; but it has also pursued a concentrated-powers approach, and has been able to develop and manage a rigorous exploration program leading the country to the threshold of production via a system dominated by a technical arm of the Ministry of Energy and Mineral Development. Figure 1 illustrates the technical/economic performance of our cases.

Following the work of Rodrik (2008), these states can be said to have pursued a sort of second-best strategy, wherein a lack of strong administrative institutions or a large pool of effective administrators prompted them to focus on one effective agent rather than formalized institutional checks and balances.^{xxxi}

Figure 1: Technical/Economic Performance Under Different Institutional Models

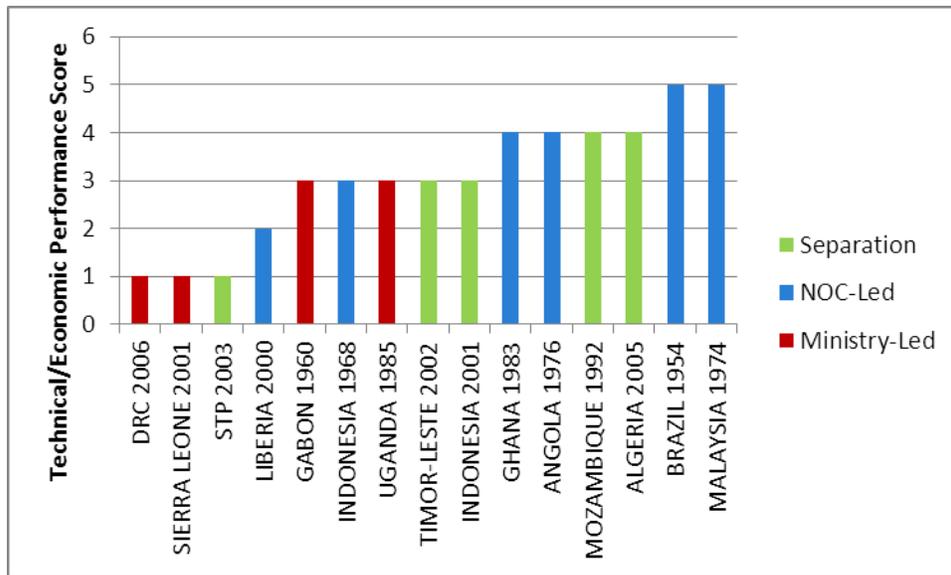
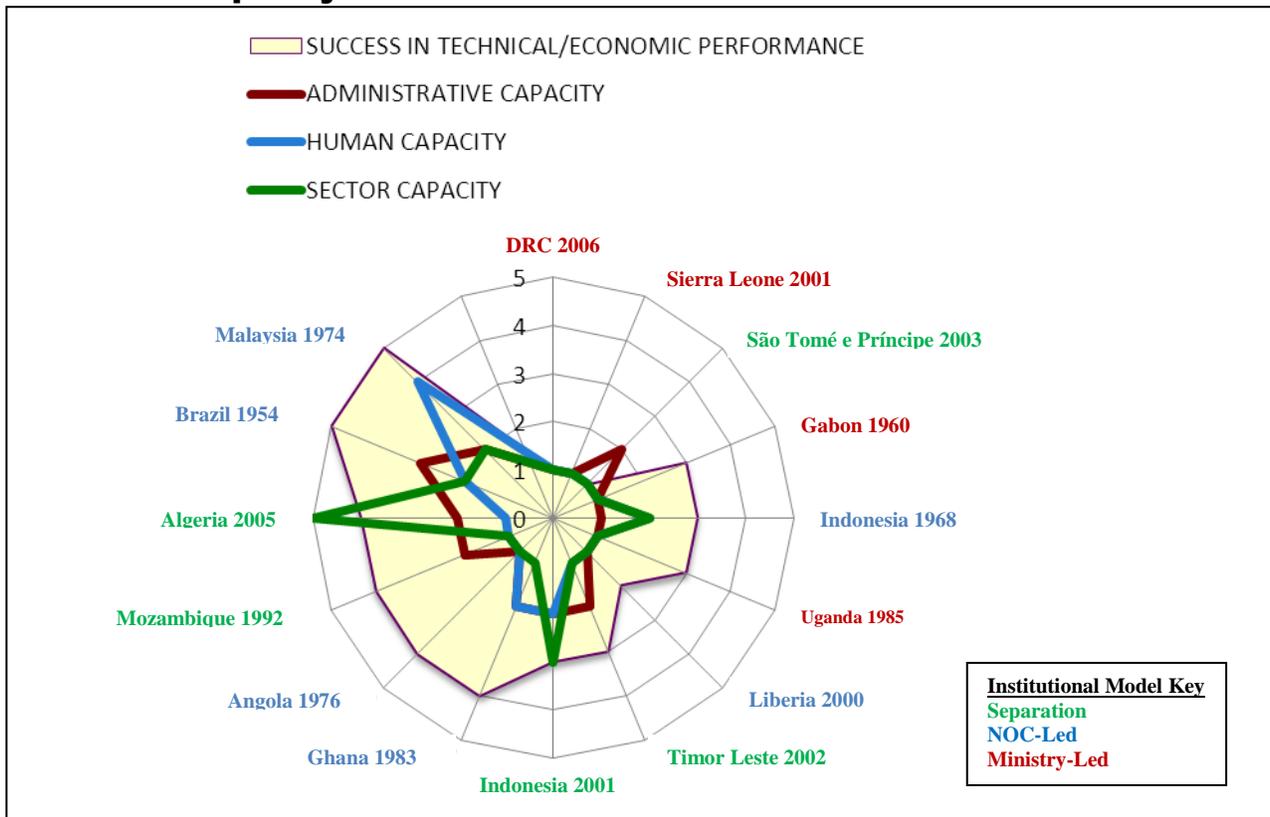


Figure 2 provides further illustration of this trend, showing that a substantial portion of the cases in which technical and economic success outpaced capacity—including Malaysia, Brazil, Angola, Ghana, Uganda, Gabon and Indonesia before its reorganization—used concentrated-power systems. The shaded yellow section in the figure represents the level of technical and economic success; in Malaysia, Brazil, Angola and Ghana it exceeded the states’ capacities, as illustrated by the distance away from the center of the diagram.

Figure 2: Technical/Economic Performance and Beginning-of-Period Capacity



Among our low-capacity cases, Mozambique has used the separation-of-powers model to generate strong technical and economic results, but the system has resulted in a weak NOC that, possessing neither commercial capability nor a regulatory role, has little meaningful influence on the sector. The NOC lacks leverage in Mozambique, having no guaranteed majority stake in deals, financial means to acquire a greater stake (or indeed to finance its own stakes), and no real influence over licensing decisions.

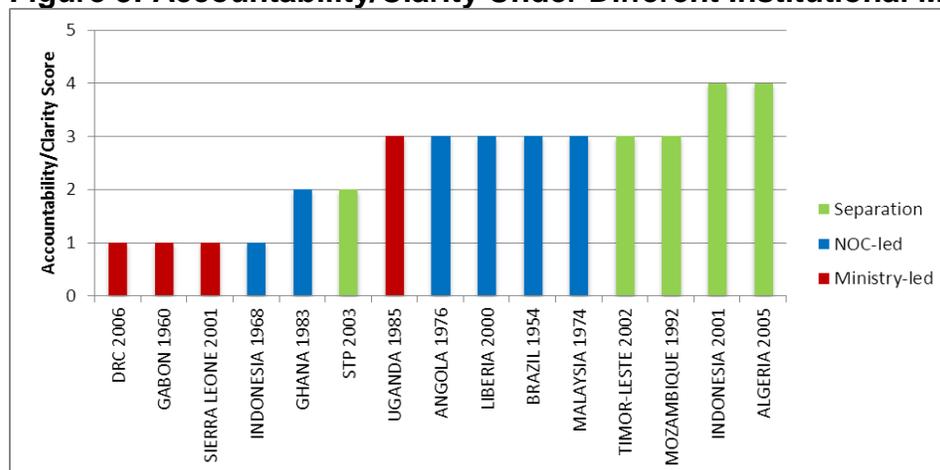
Other countries successfully introduced a separation of powers only after years or decades in which the NOC had an opportunity to build its capacity (Indonesia in 2001, Brazil in 1997, Colombia and Peru in the 2000s).

2. *Too much concentration of power can exacerbate accountability problems. Successful implementation of a separation-of-powers model can improve accountability, but many attempts to install such a model fail to take root.*

Cases such as Gabon and Angola underscore that the concerns motivating advocates of the Norwegian model are real; when the underlying institutions for accountability are weak, assigning all meaningful sectoral responsibilities to one body can hinder accountability. These countries have been characterized by the treatment of the oil sector as a fountain of wealth for a tiny group of elites, and despite the vast revenues that have been generated, the populations have reaped few benefits. It is not necessarily the case that institutional design has been the primary cause of accountability problems in these countries, but governments have used these unitary bodies as tools for elite-driven decision-making and as obstacles to scrutiny.

Mozambique and Timor-Leste, in contrast, have been able to use their separation-of-powers systems to promote accountability, both within the government (in both countries) and to the population (particularly in Timor-Leste). The experiences of these countries illustrate one of the major benefits touted by the model's advocates: by creating specialized institutions with limited mandates, intragovernmental roles are clarified significantly. Figure 3 plots the performance of the cases in our sample in terms of accountability and clarity.

Figure 3: Accountability/Clarity Under Different Institutional Models



But on its own, the simple creation of a tripartite structure does not promote better accountability in the absence of political will and a conducive reform environment. In Nigeria, attempts to install the Norwegian model have failed to take root, and have arguably contributed to the proliferation of corruption and popular cynicism about oil-sector reforms. In São Tomé e Príncipe, despite the establishment of a three-institution system, meaningful improvements in oil-sector accountability have not materialized.

Nor is it the case that strong accountability is impossible in the absence of a separation of powers, particularly if steps are taken to ensure (a) some form of

effective governmental oversight over the sector, whether via a governing board, a strong role for parliament, or other measures; and (b) extensive reporting to the public. At a minimum, strong processes of accountability must bind the NOC to the state to prevent slack governance that allows corruption to take hold, as happened in Indonesia between 1971 and 2001.

3. Surrogate administrative capacity may be needed to prop up a separation-of-powers model in low-capacity countries.

At least a medium level of administrative capacity appears necessary to successfully build up three bodies simultaneously (or even just to build up the ministry and the regulatory agency). If a country is lacking in administrative capacity, it is difficult to build the necessary institutions for the separation-of-powers model to succeed in the absence of effective, long-term foreign technical assistance.

While the separation-of-powers model is meant to encourage the strengthening of the state's administrative capacity, our cases indicate more success when the model is introduced into countries with medium or high administrative capacity. Our cases demonstrate even greater success when the separation of powers is introduced in countries in which there is also at least medium-level human or sectoral capacity.

The greatest success is in Brazil (mid-level administrative capacity and high sectoral capacity at the time the transition was made in 1997), with mixed results in Indonesia in 2001 (with lower administrative and sectoral capacity) and Algeria in 2005 (with lower administrative capacity). Among the lower administrative capacity states, the breadth, duration and effectiveness of foreign assistance programs has been a determinant of success in implementation of the separation-of-powers model. There are marked differences between São Tomé e Príncipe on one hand, and Timor-Leste and Mozambique on the other. While São Tomé's results are poor, Timor-Leste's and Mozambique results are stronger. The difference is in large part attributable to the sustained, long-term support given by foreign technical assistance programs and to the presence of foreign secondees. This was clearly the case in Timor-Leste and Mozambique, in contrast to STP, which received assistance programs only for a short period. In all three cases, human capacity is extremely low. This points to the surrogate role played by foreign technical assistance, providing a critical administrative pillar to stand up the separation-of-powers model.

Table 3: Low-Capacity Countries Attempting Separation of Powers

Country	Sustained Technical Assistance?	Success Accountability/Clarity	Success Technical/Economic Performance
São Tomé e Príncipe	No	2	1
Timor-Leste	Yes	3	3
Mozambique	Yes	3	4

4. *Sequencing matters. Some countries may elect to concentrate powers initially and then separate them later. The likelihood of success of such an effort depends largely on whether other institutions have developed the strength to be an effective check on the NOC by the time the attempt is made to separate.*

Some countries have sought first to spur development during an initial phase by concentrating power in the NOC, and then to build in checks and balances by divesting the NOC of the regulatory function and setting up an independent body. In countries such as Brazil, Colombia and Peru, these efforts have largely succeeded (Espinasa, 2008). When oil-sector power was concentrated in the NOC, these countries succeeded in significantly improving capacity, both within the sector and in administrative institutions more broadly. By the time the attempt was made to separate powers, other public bodies had the capacity and the political clout to serve as effective checks on the activities of the NOC, which was effectively obligated to focus on commercial activities. In Indonesia, the separation of powers in 2001 may have taken root for precisely the opposite reason. Public administration was weak, but so was Pertamina, and the new regulator (BP Migas) was able to raise itself to an equal footing and regulate the company effectively.

In contrast, when the NOC is significantly stronger than all other public institutions, a transition to the separation-of-powers model is less likely to succeed. This has been the case in Algeria, where Sonatrach's capabilities and political power enabled it to fight the divestment of powers, and the attempt to empower independent regulators has struggled to get off the ground. That said, the institutional reform brought improvements in clarity and accountability in Algeria. It is also noteworthy that in Venezuela, the transition to a ministry-led system in 2002 improved NOC Petróleos de Venezuela's (PDVSA's) accountability to the rest of the government, though it had a negative impact on technical and economic performance.

In Angola, the government has given vague indications that it may seek to re-empower the Ministry of Petroleum and divest Sonangol of much of its regulatory power, but the vast gulf in capacity between the company and the rest of the

public administration makes such a development unlikely. NNPC may not be technically strong, but it has similarly succeeded in developing strong patronage networks that have thwarted the efforts of outside Nigerian regulators.

This observation about the relative strength of institutions has important implications for low-capacity countries. An attempt to transition from an NOC-dominated model to the Norwegian model or a ministry-dominated system is more likely to succeed in a country like Malaysia or Ghana, which have built up effective state institutions and a history of independent oversight, than somewhere like Angola, where the power and ability of the NOC dwarfs those of any other public body. For countries like Liberia, Sierra Leone or Timor-Leste, which are at the early stages of oil-sector development, it means that if the government chooses to concentrate power now with an eye toward separating later, efforts to empower the NOC must be part of a broader plan to develop administrative institutions more generally. The nascent efforts to develop separation-of-powers systems in Ghana and Uganda will provide interesting test cases for this hypothesis.

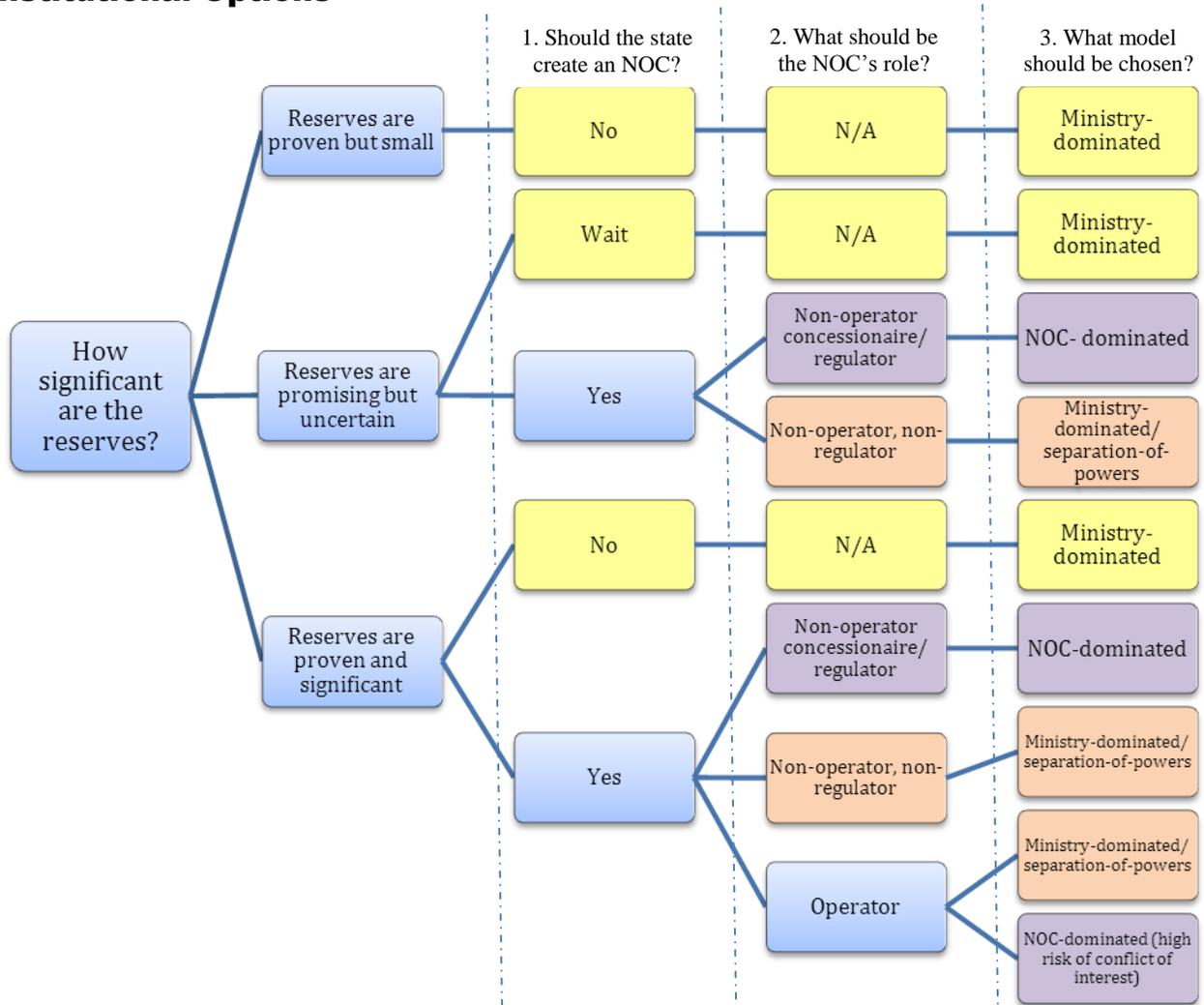
5. *Concentration of power within a ministry—as opposed to separation of powers or concentration within an NOC—represents the path of least resistance in many low-capacity countries, but its chances of success are poor when there is limited administrative capacity.*

The ministry-dominated model is popular in countries with high administrative capacity, notably the United States, United Kingdom and Trinidad and Tobago. It has also been used in many countries with very low capacity. For the latter, it is the model that requires the least new institutional architecture at the early stages of petroleum activities. It is probably no coincidence that some of the world's most conflict-ridden and capacity-challenged countries—including DRC, Sierra Leone and Uganda in the 1980s—have used this model, which in many cases may represent less a conscious choice than the product of institutional inertia. It is perhaps for this reason that the model has not been more successful in these countries. Less effort and fewer resources are needed to build skills in an existing ministry than to create a new institution. When this path of least resistance is followed, the country may miss out on the fanfare commensurate with creating a national oil company or a regulatory agency, which can galvanize popular and civil service interest. Also, in low administrative capacity cases, the ministry can struggle to keep the country's leadership or political forces within government at bay. In Gabon, DRC and Sierra Leone, for instance, these political intrusions into the management of the sector have contributed significantly to its disappointing technical results and the lack of accountability that permeates the system.

V. POLICY OPTIONS FOR LOW-CAPACITY COUNTRIES

Our findings can help policymakers in low-capacity oil hotspots analyze the kinds of institutional structures most likely to promote technical success and accountability. The following flowchart illustrates the choices available to emerging low-capacity producers and suggests a sequence of decisions for them to follow.

Figure 4: Flowchart for Identifying Appropriate Actor Roles and Institutional Options



First, a government must decide whether it wants to create an NOC. This decision should be based largely on the size of the known reserve base, which determines whether creating a company is a wise use of human, administrative and financial resources. Where the reserve base is small and/or the country is unlikely to be producing oil over a long period of time, it may be the case that production could end before the company develops sufficient regulatory or

commercial capacity to justify the costs associated with creating it. If oil prospects are unknown, a state may be justified in waiting to decide whether to establish a national company, concentrating first on strengthening administrative monitoring capacity.

Next, if the state does decide to create an NOC, it must decide what role it wants that company to play. There are two archetypes, with countries falling along a spectrum between them. At one end is Norway's Statoil, which has left the primary promotion of state interests to other public bodies and has focused almost exclusively on its commercial activities, basing decisions on profit and strategic growth criteria. At the other end is Angola's Sonangol, which focused for the first three decades of its existence on a more overarching role as the principal agent of state petroleum policy. This kind of "state agent" role can encompass a range of functions, including optimizing resource development, regulating the performance of IOCs, developing national management and technical expertise, promoting the country's oil prospects in international markets, catalyzing the development of local service providers, serving as a source of foreign currency, and performing functions from arms purchases to road construction that would typically be ascribed to traditional administrative bodies (Marcel, 2005).

Policymakers must also determine whether the NOC is to become an operating company. Developing the capacity to lead on the technical development of petroleum deposits requires years (and hundreds of millions of dollars) of investment. In countries such as Brazil, Malaysia, Saudi Arabia, Venezuela and Algeria, such investments have generated substantial long-term rewards. When the reserve base is uncertain or domestic reserve prospects are not high enough to sustain decades worth of production, a low-capacity country may not be able to generate the economies of scale necessary to develop operational capacity without sacrificing a major portion of its revenue potential. Even in many countries with large reserves, NOCs have yet to develop effective operational capabilities. In Africa, only Sonangol has developed into any kind of an operator, and that has been after more than 30 years of oil production at very high levels (approaching 2 million barrels per day in recent years).

The flowchart illustrates that a decision to develop operational capacity in an NOC is warranted only when there are significant proved reserves. When there are promising but uncertain reserves, an NOC may aspire to become an operator, but immediate investment in developing operational capacity would be extremely risky.

The third decision, intertwined closely with the second, is what institutional model will be adopted. Where a state opts not to create an NOC (represented by the yellow boxes on the flowchart), the ministry-dominated model becomes the de facto setup. The vesting of an NOC with concessionary or other regulatory powers necessarily results in an NOC-dominated system. A decision to create an

NOC but not give it regulatory power represents the only path in which a separation-of-powers system is apt (though such a government may also opt for a ministry-dominated model). In light of the foregoing discussion, formal separation of powers is only appropriate in a low-capacity country when there is (a) a significant, proven reserves base, and (b) the government can count on the sustained support of foreign technical assistance to shore up its limited administrative capacity.

An important corollary is that a government handling significant reserves may also choose a modified separation-of-powers model, in which it creates a separate technical agency to award licenses and monitor investor performance, but does not create a national oil company. This can be characterized as an improved ministry-dominated model. In comparison to the separation-of-powers model, it has the benefit of reducing the number of knowledge bases the state must invest in, provided the two institutions do not overlap, with the ministry handling policy only and the agency enforcing rules and regulations. This is often what Norwegian advisors at Norad have recommended in low-capacity cases (notably in Timor-Leste and São Tomé).

VI. CONCLUSIONS

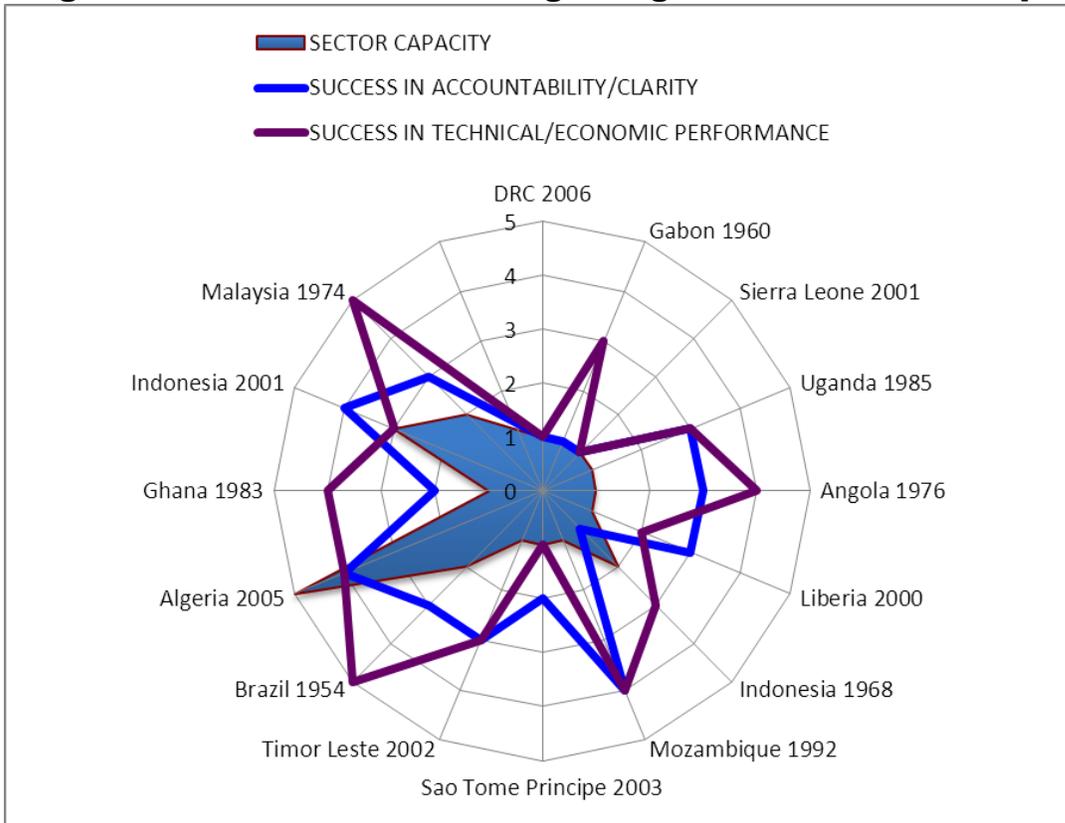
While our review provides a preliminary set of hypotheses, further systematic research into a larger set of cases is necessary to thoroughly test our propositions and build a more nuanced set of recommendations. Such research must necessarily include an examination of how political factors affect the governance outcome under different institutional models. The commitment of the political leadership to the separation-of-powers model is an important factor in its successful establishment, as is demonstrated by the divergent results obtained in Timor Leste and São Tomé e Príncipe. Political commitment is also essential for implementing strong accountability processes in the concentration-of-power models. In some cases, political will is there only for “internal accountability”—that is the accountability of the NOC to the state and not for accountability to a broader constituency.

A surprising result of our comparison of low-capacity producers was that several had very low levels of human capacity and yet had medium levels of administrative capacity. The disparity in scores for human and administrative capacity is noteworthy for countries such as Mozambique, Ghana and Namibia. This appears to indicate that building administrative capacity, at least when measured by domestic perceptions of governance effectiveness, does not require strong levels of human capacity (defined in terms of domestic perceptions of educational standards and enrollment rates).

Our results also show that sector capacity is not a necessary or sufficient condition for technical and economic performance. As Figure 5 illustrates, in Mozambique, Ghana, Angola and Timor-Leste, sectoral capacity was very low at

the outset (obviously because they were all new producers at that time), and yet they developed their knowledge of the sector and were able to develop their resources effectively. Building capacity and skills in this sector takes time and/or some help, generally in the form of cooperation with IOCs, service companies or technical assistance providers. In contrast, countries like Nigeria and Indonesia have produced disappointing results despite medium to high sectoral capacity. This is in large part attributable to political factors, which can negate the efforts of the sector.

Figure 5: Performance and Beginning-of-Period Sector Capacity



Finally, the cases make clear that institutional structure alone is not enough to determine whether a country’s oil sector will be accountable to the public or to other state actors. As Nigeria and others demonstrate, a formal separation of administrative powers will not generate accountability in the absence of strong rules on reporting and oversight, a culture of enforcement, and vigorous public scrutiny. In fact, when such processes and conditions are absent, the division of powers into multiple agencies can make corruption worse by increasing the number of open hands with the power to extract personal gain.

Our examination of the strategies and structures chosen by countries with low capacity highlights valuable lessons for countries trying to build an oil sector from scratch or to refocus activities. All things being equal, any government would prefer to have higher capacity. But low-capacity countries should react to their

Institutional Design in Low-Capacity Oil Hotspots
Heller and Marcel

special challenges and develop structures and companies that fit their needs, rather than directly adopt a formal structure that has worked in countries at a different stage of their development.

It is by looking at the experiences of other countries that sought to build new oil sectors amid serious challenges of low capacity, rather than by seeking to mimic the structures that came to exist once oil-sector institutions had already developed in places like Norway or Brazil, that the new oil hotspots will give themselves the best opportunity to thrive economically and govern responsibly.

Institutional Design in Low-Capacity Oil Hotspots
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ⁱ These three types are designed as general categories. Country practice may feature some elements of more than one model.

ⁱⁱ The distinction between sector and government financial management is important. A country may have an effective sector management allowing diligent, clear revenue collection by the NOC, but a corrupt political system in which the management and use of revenues transferred to the treasury is not transparent or audited. This is the case in Saudi Arabia and Angola.

ⁱⁱⁱ Kaufman et al (2009), which gauges “perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.” Data runs from 1996.

^{iv} World Economic Forum (2010), which surveys business officials on public institutions, including property rights, diversion of public funds, public trust in politicians, judicial independence, favoritism in government official decisions, wasteful public spending, burden of regulation, efficiency of legal framework, transparency of government policymaking and security. It also assesses private institutions, corporate ethics, accountability and auditing and reporting standards.

^v Schwab (2010), 5. Trinidad and Tobago’s success in developing skilled people for its gas industry, for example, is often attributed to the quality of its baseline education.

^{vi} The World Bank’s *Extractive Industries Source Book* points out, “Most reform recommendations, reflected in a number of countries, include transfer, with suitable transition arrangements, of non-commercial functions to government, leaving the [National Resource Company] free to get on with commercial activities,” http://www.eisourcebook.org/657_63FocusonaKeyPlayerNationalResourceCompanies.html. It asserts that “The sector ministry should be empowered and expected to delegate regulatory functions to a subordinate and quasi-independent agency,” http://www.eisourcebook.org/656_62AnOverviewoftheKeyGovernmentalBodiesandAgencies.html.

The Natural Resource Charter states bluntly: “National Resource Companies should not be charged with conducting regulatory functions,” WHAT IS 11? SECTION? PAGE? 11. Stevens asserts that “the lack of an independent and capable regulator ... is seen to destroy rather than create value,” 10.

^{vii} See Baker Institute (2007), 2-5, for a synthesis of the risks associated with profuse NOC responsibilities.

^{viii} In addition to the classic three-institution, separation-of-powers model, governments also have an option of a sort of modified separation-of-powers model in which there is no NOC but regulatory functions are allocated to an independent agency. This idea is discussed in more detail in Section V.

^{ix} We will refer to the “concessionaire” role to signify the power to award licenses for exploration and production.

^x Like the other cases here, we do not use the term “NOC-dominated” to assert that the ministry does not play a role, but rather to highlight the influence GNPC has as the most important contributor to technical decisions related to the allocation and oversight of Ghana’s oil blocks. On licensing, for example, ISODEC and Oxfam (2009) note that applications are submitted initially to the ministry, which forwards them to GNPC to evaluate the proposed “work program and the fiscal package and due diligence on the company’s financial background, track record, and

technical capabilities.” Upon getting a positive recommendation from GNPC, the ministry proceeds to work out an agreement, with GNPC a central part of the negotiating team (26-27).

^{xi} In the assessment of public financial management by the United Nations’ Economic Commission for Africa, there are areas of concerns that relate to the government carrying out quasi-fiscal activities through public enterprises that are not recorded in the budget, such as loans to the Tema Oil Refinery (UN, 2005, 22).

^{xii} For a more detailed discussion of the critiques of the accountability mechanisms of the current Ghanaian system, see Heller and Heuty, forthcoming.

^{xiii} In countries with weak rule of law, the mere existence of legislation ascribing roles to administrative bodies does not necessarily dictate how responsibility will be divided in practice. The level of the Petroleum Commission Act’s enforcement will be a powerful indicator of the degree to which the rule of law has progressed in Ghana.

^{xiv} In 2000, life expectancy at birth in Liberia was 54.4 years, net secondary school enrollment was at 19.5 percent, and net tertiary school enrollment was at 17.4 percent (World Bank, 2011b). The World Bank does not have data available for 2000 on literacy for 2000, but by 2004 it was only 53.9 percent.

^{xv} Just before this article went to press, in February 2012, African Petroleum Corp. announced an oil discovery in Block LB-09 (African Petroleum Corp., 2012). The viability of the discovery and its impact on the Liberian oil sector were not yet clear.

^{xvi} Revenue Watch (2010a). The Revenue Watch Index ranks government disclosure of critical information related to oil, gas and mineral industries.

^{xvii} Regulatory capacity in the World Bank assessment does not refer to the oil sector specifically.

^{xviii} Daniel Johnston’s projection of Gabon’s government take in 2000 was based on modeling using hypothetical field sizes and oil prices under the fiscal regime prevailing in Gabon’s contracts. He estimates the country’s average take at roughly 62 to 65 percent, close to his estimate of the world average. 2006, 67, 72.

^{xix} Executives of French oil giant Elf Acquitaine were convicted of embezzlement and bribery for their activities in Africa, which included under-the-table payments to Bongo reported at £10 million per year. Henley, 2003.

^{xx} Christian Kanku, director of legislation at the DRC Ministry of Hydrocarbons, interview with Valerie Marcel, June 2010, research carried out for KPMG.

^{xxi} Kargbo has subsequently been named acting director general of Sierra Leone’s new Petroleum Directorate.

^{xxii} Interview with Valerie Marcel, June 2010, research carried out for KPMG.

^{xxiii} Tavares Martinho interview with Valerie Marcel, June 2010, research carried out for KPMG.

^{xxiv} ENH can opt to take up to 30 percent in the production licenses. During the first production license, ENH managed to raise capital from financial institutions to cover a stake of 25 percent. In such situations, when operators plan to increase production, it falls on the NOC to raise capital for its share of the costs of the expansion; this is problematic for ENH. In an interview, ENH’s exploration manager confirmed that the NOC’s stake was carried until commercial discoveries were made, after which it would need to turn to loan markets to meet the cash call (Marcel, forthcoming).

^{xxv} Norad, “Evaluation of the Norwegian Petroleum-Related Assistance: Case Studies Regarding Mozambique, Bangladesh, East Timor and Angola,” May 2007.

^{xxvi} Stevens and Cassinadri point out that in the 2004-05 budget only \$40 million of the planned expenditures of \$90 million was spent (2008).

^{xxvii} Luis Prazeres, executive director, Agência Nacional do Petróleo de São Tomé e Príncipe, interview with Valerie Marcel, June 2010, research carried out for KPMG.

^{xxviii} This assessment was made by STP’s attorney general in review of the December 2004 awards (HRW, 2010b, 10-11).

^{xxix} Note that because Nigeria’s management of the sector has fluctuated dramatically, it cannot be classified as a consistent instance of the separation-of-powers model, and we leave it off of this comparative table.

^{xxx} Because the assessment of Brazil begins in 1954, the numerical indicators we used for most of the other cases were not available, and we based our capacity scores on statistical data and available literature that allows us to approximate the country's placement. We give Brazil a 3 out of 5 for administrative capacity. The government had by the 1950s "bureaucratized at the national, state, and local levels to a degree that would have been unheard of a generation earlier" (Levine, 2003, 121). Brazil's civil service had built up a level of skill through the 1930s and 1940s, in part thanks to conscious efforts to build effective public administration (Bresser Perreira and Spink, 1999, 120 – 124). But a series of coups had greatly destabilized government, and at the time that Petrobras was created there were significant concerns about the effective capacity of the state. Brazil's human capacity score of 2 is based on a combination of a competent and dynamic elite class of educated citizens with human development indicators for the population as a whole that were extraordinarily low. In 1950 Brazil's infant mortality rate was at 135 per 1,000 live births, higher than the rates seen in countries like Sierra Leone, the DRC or Liberia today (Instituto Brasileiro de Geografia e Estatística, 2012). The adult literacy 1950 was 49 percent, which would place it in between Sierra Leone (41 percent) and Liberia (59 percent) today (Baer, 2008). We give Brazil a score of 2 for sectoral capacity, we give Brazil a score of 2 because the government had experience regulating the oil industry and exploring for oil, but depended heavily on foreign experts and companies (de Oliveira, 2012, 515 – 522).

^{xxxi} See Thurber, et al (2011) for a more thorough discussion of the theory of second-best institutions to national oil sectors.