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National Oil Companies and the Dual Mandate

A BALANCE BETWEEN PROFITABILITY AND SOCIAL DEVELOPMENT IN THE MIDDLE EAST

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National Oil Companies (NOCs) collectively own approximately 90 percent of the world's oil reserves, with the Middle East and North Africa region accounting for about 67 percent. Yet the nature of their state ownership endows NOCs with a dual mandate: to profitably extract the country's oil reserves while also promoting economic and social development for the domestic population. This paper focuses on how the dual mandate affects the management, operations, investment and efficiency of NOCs. I argue that the prevailing culture and norms of Middle Eastern NOCs – embodied in their dual missions of profitability and social development – are an entrenched component of their identity and will continue to be a major driver of management and investment decisions. This reality presents substantial challenges for governments and their NOCs in the current era of depressed oil prices and global recession. Thus, I conclude by exploring how circumstances in both the global economy and domestic political economy of oil exporters will affect the extent to which Middle Eastern NOCs can evolve to meet new challenges.

The political economy of resource-rich states faces an inherent tension between the role of the state and the private sector over control of the rents produced by the sale of the natural resources. Perhaps no extractive industry has been more volatile than oil, the main energy source of modern industrialization. The industry is characterized by continuous cycles of spikes in demand, which precipitate an influx of actors, oversupply of oil, and eventual price collapse; the low prices discourage investment, leading to a supply shortage and again excess demand. Oil market actors – whether it is monopoly companies or cartels of countries – attempt to influence these cycles and shift the burden of price adjustment onto consumers, thereby maintaining their profit levels.

As the supply of oil grew in the pre- and post- World War II eras, vast reserves were found in developing countries and former colonies, which gave rise to an important dilemma over the ownership of the oil in the ground: Whom should own, and in turn, benefit, from the sale of the commodity – the entire population of the nation-state underneath which the reserves lie, or private enterprise and capitalists with the ability and skill to develop an oil sector for the domestic economy? As many former colonies gained independence in the period of the 1950s through the 1970s, and struggled to escape poverty, the governments chose the former option, and states took control of private,

international oil companies operating in the country. Thus, the National Oil Company (NOC) was born with a dual mission to develop the country's oil reserves while also promoting economic and social development. This public ownership of capital gave these companies special status as monopoly actor in the country's hydrocarbon sector. In exchange, they were obliged to supply cheap energy to the domestic market and support economic growth through an array of local content obligations and government-mandated employment targets.

Methodology

This paper focuses on how the dual mandate affects the management, operations, investment, and efficiency of Middle Eastern NOCs. I argue that the prevailing culture and norms of the NOCs – embodied in their dual missions of profitability and social development – are an entrenched component of their identity that will continue to be a major driver of management and investment decisions. This reality presents substantial challenges for such governments and their NOCs in the current era of depressed oil prices and global recession. Thus, I conclude by exploring how circumstances in both the global economy and domestic political economy of oil exporters will affect the extent to which NOCs can evolve to meet new challenges.

The dominance of NOCs in world oil markets cannot be underestimated: They collectively own approximately 90 percent of the world's oil reserves, with the Middle East and North Africa accounting for 67.1 percent (Marcel 2005; BP 2006). With respect to the demand for energy, the Middle East and North Africa accounted for 40 percent of global oil exports in 2005 (BP 2006). Because of the strategic importance of this geographical region, this paper focuses on the NOCs of the Middle East and North Africa that dominate global oil supply.

This paper's methodology relies in part on qualitative interview research gleaned from case studies of these NOCs. The research and analysis will shed light on the corporate culture and management attitudes – factors play an important role in decision-making at an NOC where shareholder profits are not the sole objective of management. An inherent criticism of this method is the subjective nature of the information provided by interviewees and its susceptibility to personal biases. However, such research on management attitudes does not lend well to statistical testing. Moreover, the highly secretive nature of these companies leaves a dearth of publicly available information in some research areas. As such, this analysis will combine the qualitative research with quantitative data from large, cross-country studies in order to gain insight on NOC efficiency. By doing so, this paper will evaluate how the corporate norms of NOCs affect the execution of the dual mandate, and then assess critically these norms in light of current economic and political challenges.

The paper consists of five sections. The next section will review the literature on NOCs, detailing their evolution and the transition from private ownership. The third section will examine the drivers of NOC operations and performance, presenting empirical evidence on NOCs and their efficiencies and inefficiencies. The fourth section will look at opportunities and challenges for NOCs and the implications for world oil markets. The fifth section concludes.

Literature Review: The Evolution of Middle Eastern NOCs

Because developing countries hold the largest untapped reserves, their domestic economic, political, and social challenges have a direct impact on the ability of the NOCs to bring the reserves to market, and therefore, on the long-term price stability of the global energy supply. It is crucial, however, to first understand the history of oil development in these countries in order to understand why Middle Eastern NOCs emerged, and in turn, how this history influences their current management.

There were two primary forces driving oil exploration in the Middle East and Asia in the early 1900s. The first driver was the international oil companies (IOCs) and their quest to control and integrate upstream and downstream assets to prevent overproduction and thereby stabilize the price (Yergin 1992). Second, the great powers of the period were focused on carving out spheres of influence across the globe. Thus, geopolitical concerns drove Great Britain to explore oil wells in Persia, in order to counter an expanding Russian empire and provide the Royal Navy with a secure energy supply (Yergin 1992). During this time many governments signed concession agreements with IOCs because the companies had advanced technology and expertise to explore for and extract oil. IOCs assumed the large up-front costs in exchange for a percentage of profits over a specific period, while paying royalties to the government.

However, this arrangement was complicated by what Raymond Vernon theorized as the 'obsolescing bargain' of the state. He postulates that as the terms of risk change with the progression of a project, governments have less incentive to honor the generous concessions promised to the IOCs (Vernon 1971). In fact, governments frequently did use their sovereign power to renegotiate terms in attempt to capture greater tax revenue (Kemp 1992).

Eventually, however, there was little incentive to rely on contracts with IOCs at all. Governments perceived they could reap greater resource rents and gain more technological know-how by creating state-owned companies to replace the IOCs. Moreover, there was widespread belief that IOCs – viewed by governments as extensions of the colonial powers from which they sought full liberation – were merely exploiting the natural endowments of the country and providing little benefit to the people or economy (Madelin 1974). In fact, the oil majors' operations in host countries were largely staffed with American expatriates and provided little to no benefit for domestic employment (Stevens 2008). NOCs were therefore perceived as a means to spur capital accumulation and broader economic and social development in the economy (Noreng 1997; Auty 1990). And the ideological roots of nationalization also became a source of national pride (Stevens 2008); the action represented an assertion of state sovereignty over the most valuable sector of the economy.

Another driver of the transition to national ownership was the problem of information asymmetries within the imperfect competition of oil markets. Because IOCs were virtually isolated from the rest of the economy and generated few knowledge spillovers, the government had little information with which it could assert control over IOCs or evaluate the appropriateness of the fiscal concessions and management of reserves and extraction (Van der Linde 2000; Marcel 2005). With the terms of most oil concessions lasting eighty years or more, this lack of control over such a big sector of the

economy significantly restricted the policy autonomy of sovereign states over the economic actors within their borders.

Another policy dispute stemmed from the national governments' push for higher production levels, for which they encountered steady resistance on the part of the oil majors (Sampson 1975). The incentives of IOCs and national governments were not aligned, and therefore, their respective goals for the industry diverged. The IOCs in the 1960s were concerned with stability of price, and in turn, the prevention of oversupply; whereas national governments sought higher revenues to increase the resource rents accruing to the state. Thus, if governments made NOCs the sole operator of upstream production, they would be able to capture all of the rents from use of the resource (Kemp 1992).

By the 1970s the debate also stemmed from the different discount rates of public and private actors and their views on depletion policies. With nationalization starting to occur across the globe, the IOCs high discount rate led them to extract oil as rapidly as possible. As governments became concerned about running out of oil, they thought that oil in the ground was worth more than that on the market, and thus, there was a need for depletion policies to optimize the societal benefit of production (Stevens 2008). All of these economic and political factors converged to lead to a widespread nationalization of oil companies across the developing world.

Finally, it is important to note that the transition to public ownership varied across the Middle Eastern countries. In most cases there was an overlap where the national and international companies shared operations, as IOCs trained nationals to help countries establish the technical expertise that they lacked (Marcel 2005). Saudi Aramco provides the best example of a fluid transition, wherein there was a slow progressive nationalization while the company used technical marketing agreements with IOCs until the 1980s. The relatively positive relations between Saudi Arabia and the American oil companies during private ownership had a lasting impact on how the NOC functions. The current board of Saudi Aramco even contains two past executives of IOCs (Al-Mazrouei 2007).

The Iranian national oil company, NIOC, is an example of the extreme opposite of Saudi Aramco, in that the circumstances leading up to the 1979 revolution produced hostile relations between the country's elites and foreign companies. As a result, oil contracts were universally canceled after the revolution and the ministry of oil took complete control of oil fields (Marcel 2005). Thus, the path dependent nature of how NOCs came to exist led each national company to develop its unique style of management practices, corporate governance structure, the priority of social goals, and even the revenue-sharing arrangement with their shareholder, the national government. Despite the variation across these Middle Eastern companies, the inherent tension between their societal obligations and the production of oil exists within all of the NOCs. The next section will explore the empirical evidence on how this dual mandate is executed.

Drivers of NOC Performance

Evidence on Efficiency

The most important commercial goals for NOC management are the maximization of revenue and increased efficiency of production. These priorities represent the core business functions of the company and provide working capital to sustain operations and deliver returns to the state. In Valerie Marcel's (2005) interviews with the leaders of five Middle Eastern NOCs – in Saudi Arabia, Kuwait, Iran, Algeria and Abu Dhabi – there is clear evidence that the management acts as an epistemic community within the national polity, promoting the NOC's interests in achieving greater efficiencies of production. An epistemic community is typically recognized as a network of professionals with shared knowledge and experience, and, in this case, characterizes the oil industry. The managers all emphasized their overwhelming focus on increasing their commercial competitiveness, and the desire to be compared to the IOCs (Marcel 2005). Moreover, it is clear from her interviews that the interests of the NOC and the state are inherently different. The epistemic community that runs the NOC is concerned with their profitability, exploration and efficiency (although as will be noted later, their actions do not always work strictly toward these ends). Governments, however, seek NOC profitability insofar as it supports the social and political goals of the state. That is, revenue is a means to a political end, not the end goal itself.

Although the managers do indicate a desire to be recognized for operational excellence – a goal of professionals in any field – Middle Eastern NOCs are not comparable to a purely commercial entity, despite how much the managers would like to advance that image. It is widely noted in quantitative studies of national oil companies that they have lower labor and capital efficiencies than IOCs. For example, Christian Wolf finds that NOCs on average employ 71 percent more personnel than IOCs with a comparable asset base, and generate 18 percent less output than their private counterparts (2008). In his multivariate regression of a large, cross-sectional data set, there is a significant negative relationship between state ownership and firm performance. Similar findings are presented by Eller, Medlock, and Hartley (2007), who show that NOCs are on average 35 to 65 percent less efficient than IOCs as a result of their non-commercial objectives and subsidization of domestic fuel prices.

There are also important differences in the reserve development and discount rates of NOCs and IOCs. Victor (2007) finds in his econometric tests of a sample of 90 countries that NOCs are almost two-thirds worse than the largest IOCs at converting reserves into production. To be sure, there is substantial variation across Middle Eastern NOCs in their individual performance. Saudi Aramco is widely seen as having some of the best management practices and a strong commercial culture (Meyers Jaffe and Elass 2007). Victor also presents evidence that OPEC NOCs outperform other NOCs on labor and capital efficiency, and have comparable revenue generation to private producers (2007). Still, as a group, NOCs are less efficient than IOCs and the quantitative evidence points to the non-commercial objectives as the primary driver of this divergence. Moreover, an examination of the qualitative evidence discussed below reveals the fact that Middle Eastern NOCs embrace these differences, despite their rhetoric of seeking to emulate IOCs.

Corporate Culture

Marcel (2005) presents evidence from interviews with top management at five NOCs that highlights their corporate culture. Even at Saudi Aramco – which is run more like a private company than any other NOC – management and employees view their corporate identity as motivated by the preservation of national welfare. All levels of the staff acknowledge the problem of excess labor capacity, which persists due the stigma against firing. However, it does not appear that the firm is willing to take the steps necessary to eradicate the problem. For example, Saudi executives claim to view their company as a place where a “heart culture” prevails, such that they concern themselves with the welfare of employees when making business decisions (Marcel 2005, 57). They proudly contrast this with Western culture, which they see as crude decision-making based on pure profit and loss calculations (Marcel 2005). Moreover, Marcel highlights that the young professionals in the company take pride in this approach, and notes the statement of a young manager: “(We) aren’t heartless. You don’t fire people. Sometimes we think some people should go, but then we think about their families, the people depending on them....” (Marcel 2005, 58).

Despite the favorable talk of meritocracy gleaned from the interviews, it seems that the corporate culture is not suited toward making Middle Eastern NOCs more labor efficient. That is to say, if excess labor capacity were reduced, the social implications of greater unemployment would likely provoke widespread unrest and protest. This is also the probable outcome of increasing the cost of domestic fuel, which the NOCs currently subsidize. A reduction in the social mission of the Middle Eastern NOCs would jeopardize a state’s precarious bargain with its people, whereby it sustains livelihoods through subsidized consumption in exchange for total state control of the polity.

This kind of social unrest in the producer countries would also have consequences for consuming countries. Uprisings or protests could cause short-term price increases, as observed in Nigeria when insurgents attack pipelines and cause the prices of crude oil to spike on international markets. Thus, it could be argued that the implicit social contract between Middle Eastern governments and their people – and the concomitant inefficiencies endured by the NOCs – may actually result in greater stability on international oil markets than would otherwise be the case if the NOCs were freed of social mandates, causing increased unemployment and social unrest. Of course, this kind of counterfactual is difficult to prove. Nevertheless, the political and economic stability created by this social pact should not be underestimated; the alternative scenario, of the NOC without social responsibilities, could give rise to new political instability in producing countries with the effect of increased price volatility around the globe.

The State and the NOC: Formal and Informal Interactions in the Middle East

The hierarchical decision-making structure of Middle Eastern NOCs also inhibits operational efficiency. Managers tend to shirk responsibility in decision-making, insofar as they frequently pass decisions off to more senior personnel. Moreover, change is implemented through a cumbersome process of consulting many partners for advice or dissent (Marcel 2005). There also appears to be a blurring of roles between who sets strategy and policy over the hydrocarbon sector. Megateli (1980) identified this

shortcoming in the early years of state ownership. In his study of Iran, Algeria, and Mexico, he found that NOCs should have a clear purpose that defines their authority over decision-making, which is distinct from the broad hydrocarbon policy implemented by ministries at the national level. They need to formulate specific guidelines for investment, long-term corporate strategy, and monitoring and evaluation of human resources (Megateli 1980). Of the Middle Eastern NOCs considered, Saudi Aramco and ADNOC, of Abu Dhabi, have the clearest differentiation of authority between government and NOC in the sense that NOCs generally determine strategy (day-to-day operations and goals) and governments or heads of state set policy (usually centered around volume targets) (Meyers Jaffe and Ellass 2007). Marcel (2005) reports Algeria, Kuwait, and Iran still need to clarify these roles to improve efficiency. There is also substantial informal dialogue that takes place between NOCs and the oil ministries (Marcel 2005), and this can contribute to ambiguity regarding who has authority over particular issue areas. Business models of any company can suffer from inefficiency when managers do not know whether they must consult shareholders, in this case the state, or can pursue growth strategies independently.

To be sure, a fluidity and openness to decision-making can sometimes be an attribute. For example, in the Middle Eastern region the national government or federal authority sets policy, but there is also a collaborative dialogue with the NOCs on technical matters, such as the decision to raise production. This is reported to be the case in Saudi Arabia, Algeria, Kuwait, and Abu Dhabi (Marcel 2005). Because extreme volume changes could conceivably damage oil wells, and negatively affect the NOC's long-term productive capacity, it is positive that the companies have input on these decisions since managers generally have more specialized knowledge than government officials. In fact, Saudi Aramco reports that it has influenced these decisions at times when executives thought it was unwise to increase production (Marcel 2005). Nevertheless, the government, supreme council, or head of state of the respective nation makes the final decision on volume changes and OPEC quotas. As the Saudi Oil Minister Ali al-Naimi stated, the policies pursued aim to "meet international oil demand and stabilize markets" (Marcel 2005, 79). Ultimately, the King of Saudi Arabia commands authority over oil policy (Meyers Jaffe and Ellass 2007). Hence, Saudi policy will be guided by the King's objectives, which supercede the technical advice of an NOC. Geopolitical concerns still dominate, and as al-Naimi notes, this is driven by need to preserve good relations and retain market share in the European and American markets.

Although authority over policy is concentrated with the King, this arrangement has produced distinct advantages for Saudi Aramco's management in other areas of the NOC's operations. Because the King has mandated that business and political elites are forbidden from meddling in Aramco's management, there is significantly less corruption within day-to-day management. For example, promotions are almost never the result of political favors (Marcel 2005; Meyers Jaffe and Ellass 2007). That corruption is minimized by the effectiveness of the monarchy contributes significantly to Aramco's superior operating efficiency versus that of its peers.

While the NOC must comply with their government's decision on the price of subsidized domestic oil, this is not the case for the pricing of crude exports. In fact, control over export prices has gradually shifted from Mid Eastern oil ministries to the exclusive domain of the NOCs, and appears to be driven strictly by commercial terms

and not influenced by politics (Marcel 2005). All of the five NOCs interviewed in Marcel (2005) seek to set export prices as close to the market price as possible to maintain consistency with what the market will bear. Therefore, they base prices on industry publications such as *Platts*. Of course, the volume decisions taken by OPEC governments will obviously affect pricing for these NOCs, as increased or decreased supply will affect the market price per barrel, in turn, impacting NOCs' pricing decisions. Nonetheless, the immediate impact of OPEC decisions on prices and revenue may be limited in the short-term. Middle Eastern NOCs sell most of their crude on term contracts with the shortest length of about 3 months, and most shun spot market sales due to the perceived speculative nature on these contracts. As such, they attempt to sell only to end-users on longer term contracts to ensure some degree of price stability and predictability of the revenues they will remit to the government (Marcel 2005). Thus, when OPEC increases or decreases production, NOCs are already obligated by existing contracts for their next few months of sales, thereby reducing OPEC's effectiveness in setting or stabilizing prices.

Reinvestment of Capital

Another important factor that will impact the NOCs' performance – and the ability to service the growing energy demand of consuming countries – is the capacity to reinvest profits and develop upstream reserves. This situation is increasingly critical to global supply as non-OPEC growth rates are projected to slow, and many Middle Eastern NOCs were producing at or near current capacity during the price upswing from 2003 to 2005 (Marcel 2005; Meyers Jaffe and Ellass 2007). However, the opportunity to reinvest capital and expand operations varies by country. In Saudi Arabia, Kuwait, and Abu Dhabi, NOCs report that they generate enough retained earnings to self-finance projects (Marcel 2005). From the financial disclosures made to Marcel, it appears that Saudi Aramco has 7 percent of profits after taxes and payments to the government that it can allocate for capital and operating expenditures. The Kuwaiti after-tax earnings are estimated at around 10 percent of sales, as the government generally takes between 80 and 90 percent of total revenue. The amount retained by ADNOC is not reported, except that the company retains an amount for operations and expenditures before taxation (Marcel 2005). The Algerian and Iranian NOCs, conversely, have had to turn to capital markets for financing to meet investment needs. When looking at a broader sample of developing country NOCs, however, there is also evidence that many do not retain enough revenue to self-finance investment. Stevens (2003) reports that the subsidized domestic prices covered by NOCs in Latin America and Nigeria leaves the companies cash-starved without enough investment capital.

Challenges and Opportunities for Middle Eastern NOCs

The current global recession will likely introduce new financial pressure in oil-dependent economies on the availability of capital for investment in reserve development. The decrease in global demand has significantly depressed oil prices, which fell for a sustained time below the \$50 per barrel threshold that all Middle Eastern NOCs need to balance their budgets (and some need much higher prices, signaling their worse fiscal

position) (Setser and Ziemba 2009). This added budgetary pressure will make it increasingly likely that governments will garner larger portions of NOC earnings to cover fiscal needs, thereby decreasing the available pool of capital for reinvestment. Some of the budgetary needs may be covered by the countries sovereign wealth funds, but the size of these funds has also contracted as a result of the financial crisis.

In the event that NOCs cannot self-finance investment for development of reserves, funding would need to be sought through global capital markets, bank financing, or through foreign direct investment by the IOCs, which would likely take the form of joint ventures. In Algeria and Iran, where governments already drain NOC earnings for budgetary needs, these countries borrow on capital markets. But if the cost of capital is high (like it currently is as a result of the global credit crunch) and the potential rate of return is relatively low (as it may be for the foreseeable future as a result of the recession driving down energy demand), external financing may be difficult to get or simply too expensive to justify development of reserves. Notably, however, this is not only a problem for NOCs. Many IOC drilling operations have been shut down because low oil prices do not offer high enough returns for private actors to invest.

As previously discussed, Victor (2007) indicates that NOCs are generally less efficient than IOCs in converting reserves into output because their business model is not purely profit-driven. But insofar as the assumed benefit of reserve development is a lower likelihood of price spikes and greater price stability, it is not clear that the profit-seeking interests of IOCs will operate in a way that stabilizes world oil markets from boom and bust cycles. To wit: private actors fail to invest when oil prices are at historic lows because they would end up with large excess inventories and dead capital. Nonetheless, many observers expect long-term demand to increase as a result of the growing middle classes in China and India. Thus, the problem with leaving investment to purely market forces is that private actors fail to reinvest when prices are low and thereby induce future price volatility. Moreover, increasing capacity during spikes may not be technically possible, or may not occur fast enough to alleviate the negative economic impact on consumer countries.

Because Middle Eastern NOCs are not purely profit seeking, they could pursue this long-term goal of supply stability and many would not face the same concerns as IOCs that share price will suffer from high inventories. There is obviously still a cost, which the government will bear in the form of lower net income from the NOC. But this could be mitigated through trade incentives offered by rich countries, in exchange for the producer countries' implementation of policies that will benefit global price stability in the long run. Thus, NOCs may have a unique opportunity to stabilize global supply in the future. Ultimately, this depends on the political will of the producer states, which could be facilitated by significant economic inducements from rich countries that stand to suffer from a long-term climb in oil prices.

FDI Joint Ventures

Marcel (2005) reports that the Middle Eastern NOCs in her study have faced resistance from IOCs in pursuing FDI joint ventures, stemming from the potential for idle capacity as discussed above. But as many Middle Eastern oil fields mature, the NOCs will increasingly need the technical advice and know-how possessed by IOCs to be able

to maximize extraction of reserves. The level of cooperation will depend to some extent on the quality of the relationships between NOCs and IOCs that were established in the pre-nationalization period, and the path-dependent evolution of these relationships that has occurred since that time. As such, the potential for collaboration is the highest in Saudi Arabia and Abu Dhabi, where communication between the public and private actors is fluid and ADNOC's capital structure consists of 40 percent private ownership. Kuwait and Iran face greater political obstacles to foreign investment. The Kuwaiti parliament has long been resistant to opening the oil sector to private foreign capital, and the conservative government in Iran expresses similar sentiments, with the additional obstacle of U.S. sanctions policy. And beyond the level of political will in host countries, the quality of the investment and potential return in the respective country will be major factors in determining whether IOCs will participate.

The Future of the NOCs' Social Mandates

Extreme price volatility has been an inherent characteristic of oil markets since the first discoveries in Pennsylvania during the 19th century, and it will remain a challenge for all market participants. Because NOCs are not purely profit-seeking actors, the price signals will affect their commercial decisions but will also impact the scope and extent of their social mandate. In evaluating the impact of the current recession, history can serve as a guide for how the Middle Eastern NOCs and their governments might respond. During the price collapse of 1997-98, the NOCs cut back their social spending due to the lower oil revenues. Since that time, the NOCs have gradually dissolved their former responsibilities of investing in roads, infrastructure, and social programs, and instead, currently focus their spending on training and education (Marcel 2005). The difficult quandary for Middle Eastern governments and their NOCs is that by pursuing an international policy to further their short-term interests – that is, to work with OPEC to cut production, raise the price, and capture more revenue – they would inherently harm their long-term revenue position. Price increases would likely have the effect of prolonging and even deepening the recession in the U.S. and Europe by raising companies input costs at a time when output is contracting or stagnant.

Thus, if prices remain relatively low over the medium term there will be inevitable pressure for Middle Eastern NOCs to cut operating costs. This could be most effectively achieved by reducing excess or inefficient labor. But to take such action would mean that the NOCs aggravate already high unemployment levels in the Middle East, and such action may be unpalatable to governments.

These macroeconomic challenges and their policy trade-offs are exacerbated by the demographic challenges of the Middle Eastern region. Colloquially referred to as the 'youth bulge,' the proportion of the region's population under twenty years of age averages about 38 percent, ranging from a high in Saudi Arabia at 50 percent of the population and a low in the United Arab Emirates of 26 percent (U.S. Census Bureau International Database 2009). The magnitude of the demographic challenge does not apply equally to all Middle East oil producers, with areas such as Abu Dhabi and Kuwait having small populations relative to the large size of their sovereign wealth funds. The size of the youth population raises the question of whether these economies will have sufficient employment opportunities for their growing labor pools.

Despite the fact that education rates have generally improved, the capital-intensive oil sector cannot support all of the new entrants to the labor force. The hydrocarbon sector provides jobs for only 1 to 2 percent of the total workforce in most Middle Eastern countries (Mitchell 2005). This is a serious long-term threat to political and economic stability if governments cannot create jobs to support a restive youth population. In economies that are overwhelmingly dependent on hydrocarbons, the dearth of other employment opportunities could give rise to increased social unrest in these predominantly autocratic regimes. Moreover, the increased unemployment may serve as a new impetus for the governments to push the burden of adjustment onto NOCs by forcing them to absorb the excess labor. Alternatively, labor levels could remain constant at NOCs, while the states take a greater portion of its revenues to train workers and develop the non-oil sector of the economy. Both policy options, however, have the potential to reduce the amount of capital available for reinvestment in reserves, which increases the potential for price spikes on international markets if supply does not grow fast enough to keep pace with demand.

Conclusion

National Oil Companies of the Middle East are unique from private firms because their public ownership requires that they seek to develop both the country's hydrocarbon sector and support economic development of the country. Most commonly, this takes the form of subsidizing the domestic price of energy, employing more labor than might be economically optimal, and other forms of social spending on education. The empirical evidence across many countries reveals that these priorities result in NOCs lower capital and labor efficiency than their private counterparts.

An examination of the corporate culture and management practices, however, shows that the dual mandate is a deeply entrenched part of the Middle Eastern NOC's identity. While management attests to promoting efficiency and greater profitability, there is still a prevailing obligation to national welfare that drives decision-making. Because of the historical evolution of NOCs, and the national pride they evoke in the developing countries, it seems unlikely that these attitudes will be altered dramatically in the near future. Nevertheless, it is clear that there are reasonable changes that could be implemented to improve operating efficiency. The Middle Eastern case studies show that where there are clear lines of authority over decision-making between the state and the NOC, management is more efficient. Moreover, strong leadership by the state can prevent political patronage from interfering with the NOC operations, as in the case of Saudi Aramco.

NOCs face serious challenges in light of the global recession and drop in energy demand. Most important to the long-term energy security of consuming nations is the ability of Middle Eastern NOCs to reinvest capital to develop reserves. While the largest NOCs claim to retain enough revenue for investment expenditures, this could change in an era of low oil demand and profits. The producer governments will likely want to keep as much of the NOC revenue as possible to cover budget shortfalls, thereby jeopardizing the available capital for reinvestment. Consumer nations should offer inducements for these countries to maintain or expand their investment in reserve development so that NOCs can continue to grow supply in a way that meets the burgeoning future energy

demand of emerging economies. Trade preferences are one such inducement that would offer substantial benefits to these countries, thereby helping them to diversify the economies while also ensuring stable growth of energy supply.

The Middle Eastern producers face external challenges from low oil prices, and internal challenges from the changing demographics of the labor force. The extent to which producer and consumer nations can work together to solve these problems, and promote relative price stability over the long-term, will have an important impact on the pace of future global economic growth in both rich and poor countries.

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