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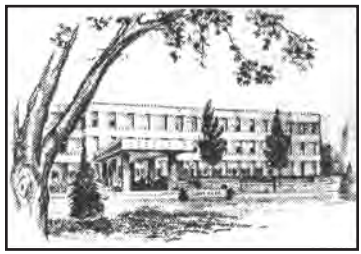

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DO OIL EXPORTS FUEL DEFENSE SPENDING?

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February 2010

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Comments pertaining to this report are invited and should be forwarded to: Director, Strategic Studies Institute, U.S. Army War College, 122 Forbes Ave, Carlisle, PA 17013-5244.

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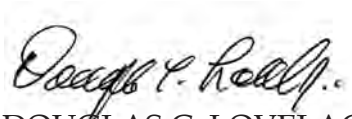
FOREWORD

Economic power allows nations to influence events within and outside their borders. In today's globalized world, many countries that export manufactured goods, provide services, supply financial credit, and control vital raw materials have the ability to significantly affect their economic well-being. Those countries can wield their financial resources to improve the condition of their citizens and neighbors or threaten a region through the development of a large military or security capability. Oil is the lifeblood of the world economy. For the past decades, oil-exporting countries have experienced great economic gains due to the world's hunger for petroleum. Undoubtedly, oil profits allow some nations to acquire advanced weapons systems or develop internal security programs. When economic conditions worsen and oil revenues fall, logic argues that with reduced profits defense spending should shrink.

This monograph explores the impact that oil revenue had on the national defense spending of five oil-exporting countries. Despite periods of falling oil revenues, these countries typically did not lower defense spending. In some cases, defense spending increased sharply, or the rate of decrease was much lower than the drop in oil revenues. This condition creates challenges for national security professionals. If nations face falling oil revenues and still have the will and ability to expand their military or security capabilities, then they might do so through the sacrifice of domestic spending or regional stability. Economic sanctions, worldwide recession, or falling oil demand may not stop these oil-exporting nations from purchasing weapons and creating large security forces.

Although oil might have been a key to provide past or future earnings expectations to fund defense, perhaps there are other reasons why nations want relatively high defense spending levels despite lower oil revenue. The politics of oil and its impact on government control, regional threats, national interests, and other strategic factors may explain why these nations pursue defense spending despite falling oil revenue.

Policies that attempt to limit oil revenues of potential enemies alone may not be sufficient to inhibit them from creating regional instability through expansion of their defense capabilities. Hopes for reduced defense expenditures, by countries like Iran, as a result of a drop in energy demand seem to be diminished by these findings. A more complex picture emerges that forces analysts and policymakers to search more broadly for options to stem potential arms races that may be fueled by the riches of oil-exporting countries.



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SUMMARY

Many national security analysts have viewed oil-exporting countries with some trepidation. Although these exporting nations supply a vital energy source to the United States and her allies, it comes at a price. A great wealth transfer occurs in this process from oil importers to exporters. In some cases, oil importers face economic woes if energy prices rise sharply. Additionally, some critics might argue that oil exporters now have the financial wherewithal to acquire a military capability that could threaten neighbors or create intra-regional instability with global implications. If oil revenues are the major factor that determines defense spending levels, then an oil-exporting nation's neighbors or other powers need to become more vigilant during times of great energy demand or price increases. Conversely, decreases in oil revenue might presage a reduction in defense spending and a corresponding lessening of tensions. Could oil prices be a significant factor in determining defense spending? If so, then the level of oil revenue may become an important predictor for future defense budgets. But what if nations decide their defense spending will be independent of oil revenues? A more serious situation might ensue if defense spending rises independently of any oil price increase or decrease.

During the summer of 2008, oil exporters received record oil profits. Oil importers suffered greatly due to the high energy prices. As the world economy retreated in early 2009, some national security analysts believed that the United States might face fewer problems from oil exporters that bankrolled their defense spending through petroleum sales. Although the premise that falling oil prices would cause a reduction of government

expenditures seems attractive, perhaps it might not be valid.

Nations that depend on oil sales or raw materials for their major source of government revenue might act much differently from industrialized or developed countries. States that rely on rents from the sale of their raw materials, leases from firms extracting raw materials, royalties, and other payments have motives to control these raw materials. Such *rentier* economies may have few options to develop wealth other than from raw materials extraction. The governments that oversee these economies could use these revenues to placate or silence critics, create a society that depends on government largesse, or divert profits for the personal enrichment of government officials. If the economy is not fully developed, then the government might be the major source of economic strength and power in the state. The national leadership may feel the need to control the sale of raw materials, like oil, to maintain its position in society. Government officials who control all aspects of the economy, politics, and society may employ this wealth to underwrite large defense budgets to enhance their own security or to create a capability to counter a national security threat.

Oil revenues and wealth serve as means to finance current and future defense spending. One method to indicate how defense spending changes with different amounts of oil revenue is simply to measure elasticity of demand. This metric describes the sensitivity of defense spending to changes in oil revenue in a given period. If, during a given period, a nation's defense spending rises or falls by a *greater* percentage than the percentage rise or fall respectively of oil revenue receipts, then defense spending is said to be elastic. Conversely, if during the same period a nation's defense

spending rises or falls by a *lower* percentage than the percentage rise or fall respectively of oil revenue receipts, then defense spending is said to be insensitive to oil revenues, or inelastic. The most extreme and threatening form of defense spending inelasticity in a potential aggressor nation occurs, of course, during a period when the percentage rate of defense spending is trending upward at the same time that the percentage rate of oil revenues is trending downward. That could be a very troubling sign in regions afflicted by rivalries.

This monograph examines five countries that relied on oil exportation for a large portion of their Gross Domestic Product (GDP)—Venezuela, Iran, Saudi Arabia, Kuwait, and Nigeria. Each nation exhibited a mainly inelastic demand for defense spending vis-à-vis oil exporting revenues. This suggests that oil revenue is only one factor in determining why nations might have a high rate of defense spending. These countries increased defense spending even during times of declining oil revenues.

Each nation experienced situations where annual oil revenue decreases failed to slow defense spending, and there were years when defense expenditures actually increased. Additionally, in countries that did not decrease defense budgets at the same rate of oil revenue reductions, military expenditures fared better. However, in some instances, worldwide economic slowdowns did cause reductions in defense spending, but this condition was temporary and not universal to all oil exporters.

If oil revenue is not the major determinant of defense spending, then what other factors could affect such spending? Nations might rely on many years of oil revenue accumulation to disburse during lean times. Long-term defense systems like aircraft or ballistic

missiles might require many years to acquire. Security-conscious countries might fear the growth of a regional rival, domestic opposition, terrorism, or other threats that require military forces regardless of the level of oil revenues. To explain why defense spending increases or decreases, analysts would need to consider country-specific rationales rather than concentrating solely on oil revenue measures. Policies that attempt to limit oil revenues for nations that potentially endanger national interests may not significantly affect defense spending. Thus, a one-size-fits-all policy would probably fail; instead, mitigating regional threats or pursuing other options to reduce the defense spending of the target state might be more successful.

DO OIL EXPORTS FUEL DEFENSE SPENDING?

In the summer of 2008, American and other energy importers faced a global economic crisis as spot crude oil prices reached record highs. With oil prices exceeding $147 a barrel, oil exporters extracted enormous additional profit from their valuable petroleum commodity. These countries gained not only financial resources, but strengthened influence that frightened many consuming nations. Energy-dependent importers had no option but to pay higher prices, and oil exporters received a windfall economic boost. This wealth transfer caused other concerns. The increased energy prices forced Americans to change their lifestyles. Transportation costs rose, and firms had to raise prices of products despite the current economic troubles. The economy suffered from reduced demand for airline travel, manufacturing production reductions, and consumer hardship that worsened the crisis.

The rising dependence on foreign oil supplies also created problems that threatened America's national security in other areas. Rising oil prices have allegedly emboldened certain nations to pursue adventurism throughout their regions. Oil-exporting countries flush with export revenue could use these funds to purchase weapons, provide aid to unfriendly organizations or groups, or finance terrorist activities within the region. Additionally, high oil prices provide governments with resources to spend lavishly on social programs for the public or expand domestic security capabilities to prop up their own authoritarian governments. Limited oil markets can also influence relations between nations. Oil producers might sway American allies to support positions or remain neutral on certain issues with the promise of an uninterrupted petroleum supply,

a reduced price, or subsidy for their allegiance. Such action is especially effective during times of rising oil prices and limited supplies. Similarly, oil profits may allow nations to fund weapons development, like Iran's nuclear programs, and expand military capabilities that cause global concerns.

While prices for gasoline, heating oil, and other petroleum-based products reached worldwide record highs, another economic crisis was brewing. Financial institutions started to fail due to a toxic mixture of subprime home mortgage foreclosures, questionable financial credit policies, bankruptcies, and failing economies. These actions culminated in a global economic slowdown. Rising energy prices may have significantly contributed to this slowdown. Unemployment rose, consumer spending spiraled downward, banks and financial lending institutions froze credit, firms laid off employees, automobile companies were forced to the brink of bankruptcy, and banks failed. The U.S. Government provided massive aid to banks to avert a financial meltdown. Demand started to ebb for oil. Oil prices started a precipitous fall. By the day after Christmas 2008, oil prices had fallen to about $33 a barrel. Some experts believed that the reduced oil prices and "declining revenues [would] put a squeeze on the adventurism of producers like Iran and Venezuela."[1] Rising oil prices were the catalyst for actions that would harm American national interests. If oil prices fell, then export revenues would deflate and limit this harmful behavior, or so it was thought. Lower oil prices would induce petroleum-exporting countries to cut defense spending along with other government outlays. This action would lower tensions among regional rivals and forestall potential crises involving the United States. This putative linkage

between economic health and spending on activities that include foreign policy actions, aid to other nations, and defense spending would have profound implications for the United States, if true.

The erratic movement of oil prices creates serious impacts on world consumers and petroleum-exporting countries. Rising oil prices may lead to inflation, unemployment, limited economic opportunities, slowed trade, and other problems for consumers. The same rising oil prices are a valuable asset for oil-exporting countries. Some countries became rich overnight and used their new wealth to increase government funded programs. Oil revenues provided a broad avenue toward economic growth. This growth may be uneven since oil revenue may be under the control of government, private enterprises, the public, or some combination of the three. Competition may become a source of conflict over the control of oil.

Typically, governments balance the competition for resources among investments for future economic growth, socio-economic programs, and military spending.[2] The tension between these demands and available resources provides a challenge for most governments. Nations that rely on raw materials extraction and exports face a greater test. Industrialized and developed nations have diversified and mature markets that can compensate for economic downturns in particular segments of the economy or problems in the capital markets. However, problems exist for oil exporters. In an economy dominated by oil, economic downturns in the energy market can bankrupt the government unless it can find alternative financing or fall back on national savings. Conversly, oil revenues can rise during global economic expansion or through shortages caused by economic embargos, production limitations, or natural disasters that limit oil supply.

Rising oil prices facilitate the acquisition of greater resources and perhaps economic development. But oil revenues can also drive a government to finance massive military equipment purchases like Saudi Arabia did in 1979.[3] The nature of governments that rely on raw material extraction and long-term development of military programs may affect how their current and future spending occurs regardless of oil prices. How nations decide to use their national wealth helps explain some of the perennial problems facing oil and commodity exporting nations and provides insights into their relations with other countries.

Falling oil prices might cause governments of those states whose economies rely heavily on petroleum exports to reduce defense budgets. Some oil experts speculate that falling prices affect the producer's behavior and they will act to reduce their propensity to spend on discretionary government activities like defense spending. In this view, oil revenues are linked to the ability to pay for discretionary defense and other programs. They also speculate that reduced oil prices in turn will change how major nations act.[4] The implication is that these nations will reduce their defense programs because their ability to pay is lowered, and this condition will then allow the United States to limit its defense budget safely. However, such speculation might not pan out. Countervailing considerations may also influence defense spending patterns. Strategic demands, national objectives, regional threats, and other interests of producers may force increased defense spending despite reductions in the primary source of national revenue. With regard to our five selected countries that depend on oil exports to fuel their economies, do rising oil prices create conditions where defense budgets increase? Similarly, would falling oil

prices also predict cuts in defense budgets? Certainly large oil revenues help create conditions that can lead to increased spending on government programs. The same can be said for threats that may drain reserves created from past oil sales, forcing oil producers to seek credit. Oil may even play a large role in determining the nature of government itself. Resource-extracting countries could find their wealth concentrated in the hands of an oligarchic few in government to the public's detriment. Defense and security spending may be linked to a felt need to maintain the internal status quo rather than pursuing external adventures in the region or beyond.

RENTIER ECONOMIES AND OIL

International trade involves a host of complex relationships and mechanisms to facilitate the exchange of manufactured goods and services. Most countries now conduct business transactions globally. Despite differences in foreign exchange, cultures, laws, and product standards, businesses find common ground to purchase finished goods, acquire commodities, receive services, transfer financial capital, and obtain technology. Widespread economic globalization has boosted the world's income level and distribution of wealth, albeit with some concerns along the way. Broadened economic activity has required firms to produce additional finished products to sell abroad and to a wider domestic market. Marketable manufactured products require a vast amount or raw materials, including oil. Additionally, sea, ground, and air transportation of products and raw materials needs oil. Developing countries that have garnered economic gains from trade also face demands for higher stan-

dards of living among their publics. Citizens want better nutrition, access to consumer goods, transportation, and a host of other benefits that require energy and a larger share of corporation and government revenue, whether from a tax-based redistribution of wealth or from direct profits from state-owned enterprises.

Greater demand for energy in developed and growing economies like those of China and India has pushed petroleum exploration, drilling, production, and shipping to new heights. Citizens in these developing nations demand energy in the form of transportation, utilities, goods, services, and infrastructure. China has aggressively sought increased and better secured oil and natural gas sources. In 1997, daily world oil production averaged 72,231 barrels. By 2007, expanded state-owned and private petroleum enterprise efforts to find new oil reserves, extend drilling, and improve distribution pushed daily production levels to 81,659 barrels.[5] A few exporting countries process the oil into refined gasoline or provide some value added service to enhance the raw material, but many do nothing but extract it and sell the raw oil to a buyer. Unfortunately, states that sell oil as a commodity do not benefit financially from the value-added processing of oil into usable energy or derivative products like plastic.

The large oil-producing countries earn most of their Gross Domestic Product (GDP) through the direct sale of oil. For example, 90 percent of Saudi Arabia's GDP derives from petroleum-related activities.[6] Iran receives 80 percent of its GDP from petroleum products. However, Iran has more diversification in its economy, which includes some agriculture and manufacturing. Still, such oil-producing nations must rely largely on oil sales to foreign countries to sustain their economies. They receive rent for the use of their

natural resource from purchasers. This rent may take the form of royalities paid for offshore drilling, leaseholds for access to oil-rich properties, or long- or short-term production contracts.

If nations use the rents to improve and diversify their economies, they may not be subject to wide swings in the demand for energy or the damaging effects of a worldwide economic depression. Typically, the oil-producing government controls either the state-owned enterprise that sells and distributes the oil, or it sells the leaseholds or mineral rights to international oil companies. The government then collects the rents and distributes them through government activities, income programs, jobs, or contracts. Some countries have democratic governments, giving the public a voice in the distribution of these rents. Other oil-producing nations' populations do not have direct popular input. Some rentier economies do very well in oil sales, receiving sufficient funds through direct sales or royalties to obviate taxation of their citizenry to operate the government. But without domestic taxation, political intercourse within a state can atrophy as the citizenry provides tacit consent to the government to make decisions independently of public debate in exchange for its meeting their social welfare needs.[7] If oil revenue falls, this tacit contract might be broken, with popular discontent resulting.

For example, post-Cold War Russian economic growth was stymied as that nation converted from a centrally controlled to a free market system. One advantage the Russian economy did possess was abundant natural resources. These raw materials seemed a poor second to manufacturing because of difficulty in accessing them. But global energy demand, outside capital, trained labor, technology,

and increased access to Russian raw materials by Western corporations opened the energy sector to rapid development.

Fueled by rising global energy prices, the Russian economy grew. Several Russian energy firm owners became instant tycoons. However, immense oil and natural gas profits motivated Russian government officials to take control of private energy enterprises. With these economic engines under his control, President Vladimir Putin was able to singlehandedly control and change many of Russia's institutions and policies, while circumventing democratic instititions and processes. Putin's drive to build a resurgent nationalistic Russia was based on his ability to improve the standard of living of the public. Incomes rose, goods and services flowed into the country, and nationalism flourished, all due to oil revenues. These revenues allowed Putin to convince Russia's elites to follow his policies, bribe the population, and deter protest in exchange for authoritarian rule.[8] The Russian public's discontent over accusations of corruption, infringements of democracy, and other issues was muted as long as the standard of living rose every year. Contractions in the global economy forced reductions in the demand for imported products and services, including oil. Falling oil revenue has endangered the ability of the government to meet the expectation of a continuing rise in the standard of living for Russian citizens. This development could have serious repercussions for Russia and the West. These governments face a quandary on whether to continue to fund social welfare programs, economic development, or defense. Governments that do not have public support or that face external threats may have to sacrifice domestic spending to maintain defense budgets. Conversely, if the nation chooses to

spend additional funds on defense, then it may face rising public discontent that could require higher current and future defense spending regardless of oil revenues. In the case of Russia, more government control over businesses and consolidation of political power may result.

Countries that depend on raw material extraction and that do not have the requisite technology, financing, or skilled labor may be forced to accept foreign corporate intervention to exploit their resources. Given the profits and resources at stake, corruption in the award of lucrative contracts is a potential concern regarding the selection and continued natural resource extraction from developing nations. Oil is a particularly sensitive material since it commands high levels of sustained revenue streams for its producers.

Some developing countries that export oil are susceptible to authoritarian rule. The reliance on oil as a major revenue source may even drive countries to limit efforts to introduce democratization into their states. One study examined three causes. First, some nations may use oil revenues to ensure that their particular governments and leaders preserve their positions. Middle Eastern, African, and Southeast Asian nations that export oil can use control over the distribution of resource wealth to block democratic aspirations of the population, thus assuring that the current government stays in power. These countries may spend excessively on defense or security measures since resource wealth may lead to ethnic or regional conflict over its division.[9] Second, governments may limit certain types of valuable programs such as education. Vocational training and limited basic educational programs might supplant higher-level educational systems that encourage political reflection and activity, thus fostering unfettered

discussion and potential opposition to government policies. By controlling education levels, economic development, and other culural changes, countries may try to limit any intellectual or social catalysts that encourage democratization. These countries spend their petroleum wealth on programs that may indirectly slow the development of democracy while bolstering the current political order. This move may also further arrest development that would diversify the economy and shield the nation from economic turmoil if oil revenues fell. Third, the rentier, or landlord, economies that bring great wealth may affect the behavior of their governments. Governments of such states may spend oil profits on the population in exchange for less public demand for transparency or accountability for their actions.[10] The government may opt to provide lavish job programs or provide generous income to its citizenry through subsidized jobs or a paid stipend from oil sales in hopes of placating any political opposition. Other rationales for these actions might include patronage and the use of resources by the government to forestall the creation of political opposition groups.

Some oil revenue might be linked to desires to underwrite regional or global aims, or the increased defense spending borne by the state could be directed towards internal or domestic initiatives. Construction of ballistic missiles, weapons of mass destruction (WMD), or other high-impact weapons certainly poses threats to neighbors. Such capabilities also serve as a source of national pride and may provide a more satisfactory view of the government by its public, especially if there is a perceived national threat. Iran's building of a ballistic missile force and nuclear program helped provide a deterrent against Saddam

Hussein and now demonstrates a potential capability to destroy another hated foe, Israel. Moreover, such weapons bolster the Islamic state in its determination to stand up to pressures from the United States and other western countries. A nuclear-capable Iran can also threaten other regional states and perhaps influence their behavior in preferred ways. Such behavior could include tacit acquiescence in Iran's ambition to exercise political influence throughout the Middle East.

Government control of natural resources might take the shape of state-controlled enterprises or the sale or lease of oil drilling rights that may limit transparency in the use of any profits, taxes, and payments from commercial oil companies. Centrally controlled use of resources might not ensure their efficient or effective use. Development could concentrate on the oil industry, which is reliant on capital-intensive labor, often in short supply. Many nations that rely primarily on mineral extraction tend not to develop industries beyond drilling, storage, shipment, and others narrowly associated with the resource in question. This tendency limits economic development and can foster resentment among citizens who are unemployed as a result. This situation could in turn require the government to deal with greater security demands. This vicious cycle of resource demand would necessitate greater control of oil by the government and further limit political reform. Ad hoc dissident groups could target the oil industry to reduce the government's anti-reform leverage. Government retaliation might in turn drive the dissidents to seize control of oil facilities or obstruct its extraction, transportation, or processing.

Nations of whatever level of development might expand their military expenditures based on ambition, fear, or legitimacy.[11] Instead of increasing domestic spending and thus maintaining their positions and

status within exisiting governments, leaders may choose to expand defense spending for strong countervailing reasons. As we have seen, nations with various kinds of economies may increase their military spending whether there is an increase in national income or not. Nations may feel the need to have a greater military capability in order to underwrite a more aggressive foreign policy. Instead of relying on negotiation and diplomacy, which may have not yielded a hoped-for outcome, a government might use its military to gain its goal forcibly.

These nations could also fear a neighbor or anticipate a regional conflict that would fuel an arms race. If one country builds a military capability proficient enough to invade or strike a nearby state, then the threatened state may need to build an air defense system, purchase antitank weapons, or obtain other capabilities to repel the aggressor's potential moves. Fear can drive the government to justify large and extended defense expenditures regardless of inadequate oil revenue.

Oil-exporting nations may also use their wealth to build a military and fund an international venture in the hope that it will divert the attention of domestic critics. These countries can use their oil revenues to pay for conventional military forces, internal security, or subsidies for extremist and terrorist groups that operate outside their borders. Governments may use nationalistic pleas to win public support for the country's foreign policy agenda. If the government can gain initial public support, then it can use this opportunity to strengthen its legitimacy in the eyes of its citizenry and thus maintain its position.

Although economic growth offers the means to expand defense spending, the rationale for such

spending needs more detailed analysis. Defense spending may include projects that require long-term funding commitments. Ministries of defense might plan for replacements of their air defense interceptor or naval ship building activities that require years to negotiate, design, develop, build, and deploy. The commitment to acquire these programs occurs regardless of oil revenue flow. In 2009, oil revenues dropped for many petroleum-producing countries. These countries still chose to maintain and, in some cases increase, military spending due to long-term purchases of complex systems and regional instability threatening their security.[12] The major source of apprehension among some of some Middle Eastern oil producers is Iran with its expanding military capability, especially its suspected nuclear weapons programs, delivery systems, willingness to fund and aid radical Islamic groups, capability to wage a conventional land campaign against neighbors, and ability to obstruct oil tanker traffic in the Persian Gulf.

MEASURING OIL'S EFFECT ON DEFENSE SPENDING

During periods of rising oil prices, nations heavily reliant on oil exports will see the GDP spiral quickly to great levels, given the size of the export market and demand by consumers. For oil-dependent countries, the demand for petroleum leaves little room to negotiate changes to any short-term prices or orders for oil. World oil demand and limited production forces nations to pay the current or "spot" price. Oil is largely a fungible resource for which sellers can immediately seek the highest offered price regardless of prior agreements. Although oil-importing countries can adjust lifestyles, seek new energy

sources, introduce new technologies, and undertake other measures, these actions take years and require difficult living and cultural adjustments. Particularly, some economies may attempt to conserve energy, but certain activities, such as driving automobiles, require extensive behavioral changes or technologies to improve automobile mileage standards, but these actions take time. Oil demand may be very insensitive to price changes, that is, inelastic, over a short period of time (more on this subject later). Despite huge oil price spikes, individuals and governments might not change their oil consumption behavior.

An oil producer may face a fall in demand due to weakening economic conditions or rivals who are expanding their oil exports to advance their market share. The rivals can advertise below-market prices to entice customers. When prices fall, these oil producers might attempt to compensate for the fall in prices by increasing the volume of oil sold. These activities may also further depress oil prices through a round of price cuts used to undersell competitiors, which will force a continued increase of production and decrease in price. Falling oil prices could signal a forced rentrenchment of government spending cuts, including defense. Social demands for improved health care, income redistribution, jobs programs, and other domestic activities to ameliorate economic concerns may force defense spending and other discretionary spending to take a back seat in their budgetary share. Oil price reductions have forced Venezuela's President Hugo Chavez to reevaluate government spending. Chavez used spending on social programs to bolster his government and maintain power. Despite the desire to maintain welfare and social spending, he announced that budgeted spending will fall by 6.7 percent

in 2009.[13] Reduced oil prices, falling production, inflationary pressures due to government mandated increases in minimum wages, lack of foreign exchange reserves, and limited access to credit markets have forced painful cuts in many governments' budgets and created the potential for long-term economic problems. Of course, such a situation could have a bright side. If raw material prices fall, then a situation might arise where the people shout for the creation of democratic insititutions to better serve their interests.

There are many challenges in determining whether oil prices and revenues can influence certain exporting countries' foreign and domestic policies. Measuring whether oil revenues have an impact on defense spending over the course of a year may provide only a snapshot in time. A change in government, regional problems, or other developments might obscure the long-term pattern of behavior towards defense spending. A nation could have faced unusual conditions that affected their decisions on defense spending independently of oil revenues. Similarly, defense spending to improve particular capabilities may require years to take full effect. Acquisition programs to build a ballistic missile, develop nuclear capabilities, or launch a satellite require long periods of research, development, and operationalization. A longitudinal study that compares changes in a nation's oil revenues during bust and boom periods can help determine whether defense spending is affected by such acquisition programs. Additionally, a direct comparison between nations may be obscured or distorted by the scale of oil revenues or the use of different monetary units. Fortunately, most international oil traders still transact business in a common currency, the U.S. dollar.

As we learned in any introductory economics course, economists frequently try to measure the effect of one action on another. Recall, for example, that economists evaluate how changes of a product's price can influence consumers' demand for that product. Normally, there is an inverse relationship: if the price of an item falls, the demand for the item increases. With regard to price vis-à-vis the demand for a typical good, product, or service, the public would normally demand more of the item if the price decreases. For example, if gasoline prices fall, assuming all other relevant conditions remain the same (e.g., income levels stay constant), then the public should demand more gasoline. The totally defined relationship between these variables provides some evidence of causality or its absence. Obviously, not all relationships are inverse: if *income* rises, then demand for a good or service usually also rises. Incomes from a nation's economic activities are reflected in its GDP. Rentier economies earn their incomes through the sale of raw materials or through royalties from leaseholds. We can normally expect their oil revenue to have a positive relationship to government spending, especially defense expenditures, but such is not always the case.

One can study the impact of oil revenues on defense spending by using a known economic measure, elasticity. Elasticity allows one to assess how responsive the change in defense spending is relative to changes in oil revenues. One can compare oil revenue changes to the demand in defense spending to see if oil sales primarily affect government actions. This does not necessarily imply causation, but some relationships may provide insight into government motivations and behavior. In the case of major oil producers, revenues for government come primarily from petroleum extraction and sales, whether past,

present, or projected. The government could use current export earnings for expenditures on defense, it could use past earnings to fund current activities, or it could borrow funds based on potential sales or leases.

The oil revenue elasticity of defense spending measures the percentage change in defense spending compared to the petroleum receipts from oil exports during a given period. The measure of elasticity gauges how a 1-percentage point change in one variable affects the percentage change in the targeted variable. The change of the targeted variable could be greater, less than, or equal to 1-percentage point. A small increase in oil revenues may be related to a much larger increase in defense spending or the reverse. An increase in one variable may result in either a positive or inverse relationship. For example, the relationship between changes in oil revenue and defense spending may be positive, with both increasing. In this situation, oil revenue provides a means to buy more arms. Conversely, the relationship between increased rates for oil sales and certain types of spending might be negative, with other types of spending declining. In still another case, oil revenue spending on a particular government program might reflect the same percentage rate increase or decrease as in a country's defense spending.

Oil revenues are income for a state with a rentier economy, determining the state's ability to purchase the wherewithal for national defense. If defense spending rises or falls in a positive relationship with oil revenues, then the relationship should approach an elastic one. As oil revenues expand, defense spending should increase more than the change in oil export sales. This relationship implies fundamentally that the scale of defense or military expenditures depends on the health of the oil market. If the relationship is

anything other than elastic, then further research is required to explain the direction of defense spending increases or decreases. Nations that retain the same or greater defense spending level despite reduced oil revenues may indicate that for them oil export sales have little or no relationship to defense spending. Perhaps a much weaker correlation defines the relationship.

Oil revenues change due to limited supplies, increased use by consumers, supply disruptions, global economic conditions, environmental concerns, technology, and consumer behavioral changes.[14] Since oil prices fluctuate daily, governments have limited control over their oil revenue unless those governments can order the release of large oil volumes on the market to compensate for the drop in price. These countries may have large reserves of oil, untapped production capacity, or stored oil that they are willing to release at a later date. Some countries belong to the Organization of Petroleum-Exporting Countries (OPEC), a cartel, which attempts to control worldwide oil markets by creating artificial global limits in production for member countries that will enable the cartel to manipulate oil prices. Other nations can and often do cooperate with OPEC policies. However, some OPEC members or others might undercut prices to expand their market share. Exporting countries can influence the market in several ways. If oil prices rise, then these countries may cut production, benefiting from the consequent higher prices and also harboring oil reserves for the future. Similarly, when oil prices fall, the state might order an increase in oil production to compensate, using sales volume to maintain oil revenue.

Our central concern in all these observations has been to determine what happens to defense spending. That is, if oil revenues fall, would defense spending

decrease to a proportionate level, decrease more, or decrease less? For many countries, decreases in major GDP components would trigger demands for reductions in discretionary government spending such as defense outlays. If defense spending among particular countries, like Iran or Venezuela, continues to rise or the decrease in defense spending is not as great as that of the oil revenue, then this behavior may be a bad omen for the region or other nations that have interests in that region. If defense expenditures appear inelastic or insensitive to oil revenue, one needs to seek other factors to explain such defense spending. Despite oil revenues falling, defense spending may actually increase, in which case neighboring countries need to be wary.

With regard to Venezuela, Iran, Saudi Arabia, Kuwait, and Nigeria, we shall examine in the next section the oil revenue elasticity of defense spending, using each country's past 10 years of complete data to measure behavior. Many developing countries do not have a reliable means of gathering financial statistics. Estimating the amount of oil revenue may thus be difficult. Additionally, calculating defense spending is a problematic art. How can an outside observer measure expenditures or anticipated purchases confidently? Several oil-exporting countries lack transparency, meaning that ascertaining internal budgetary and spending amounts may be pure speculation. Determining the composition of defense or security spending requires another complex and problematic calculation. Police, dual-use infrastructure, communications systems, and other entities that appear nonmilitary in nature could actually mask their true use, thus further obscuring outlays that are in fact part of defense spending.

In the present case, our analysis relies on oil revenue and defense spending data reported to OPEC and the International Monetary Fund (IMF). The U.S. Energy Information Administration also provides a reliable source of data to back up the other two sources. The study also compared its information to other sources as a rough gauge of accuracy.[15] The defense spending calculations are based on yearly defense budgets. These amounts provide a long-range view of a nation's spending plans or intentions that may include large capital investments (e.g., jet aircraft or ballistic missiles) or expansion of the labor supply that goes beyond normal short-term fluctuations in oil prices. Defense budgets allow governments to commit resources to enact policies. Increasing a nation's military capability may require a huge chunk from current oil revenues or foreign exchange earnings from past petroleum sales, thus reducing resources for domestic use.

Export oil sales may not result in receipt of foreign exchange, but instead goods, services, labor, technology, or even political gain. Nations that sell oil may also receive military goods from a buyer through a barter arrangement. States may conclude long-term oil contracts based on factors other than the price of oil. The Soviet Union provided weapon systems, oil, and finished goods in exchange for sugar at artificially high prices to support a faltering Cuban economy, thus demonstrating its political and military support for a nation under U.S. economic sanctions. The trade for sugar provided a veil of legitimacy for this exchange. Despite variable world sugar prices, Havana could count on stable resources from Moscow to fund its military activities.

Oil revenue does provide a means to purchase weapon systems and fund security forces to protect a country from external and internal threats. Protect-

ing national sovereignty is a paramount interest. If a government faces an external threat, then it might very well increase defense spending despite its inability to find sufficient oil or other revenues to pay for the defence increase. However, such countries could use their potential oil revenues as a means to pay for these expenditures through the sale of future leaseholds, negotiating long-term purchase agreements for weapons, or using foreign exchange reserves from prior oil sales for weapons and military programs. Governments could also defer social welfare payments and break the implied contract with its citizens to provide a satisfactory level of services in exchange for public acceptance of the current form of governance. State-supplied incomes or subsidized employment might end, with the government forcing its citizenry and businesses to pay increased taxes. The rise of defense spending could then become a way to deter the external threat and perhaps forcibly consolidate the government's power and position after the social contract fractures.

States may use oil revenues as an instrument to achieve foreign and domestic interests in still other ways, e.g., employ oil revenue to fund opponents of a threatening foe, combat internal dissent through greater social welfare programs, providing payments to the threatening nation to avoid conflict, and other such actions. The government could also suspend overt spending for defense or security programs and divert the money into covert defense channels, thus disguising its true nature. Transparent defense spending is only one approach.

HOW DO OIL REVENUES AFFECT DEFENSE SPENDING?

All five of the nations studied have compelling reasons to maintain a strong defense and security apparatus due to internal or external threats. These nations all have large income-producing oil export sectors. Additionally, each nation is an OPEC member. They have relatively large military spending commitments compared to their neighbors. These nations have been selling oil for several years and will continue to do so well into the future.

The five country cases demonstrate only a limited degree of responsiveness to oil revenue changes relative to defense spending from 1997 to 2007. All of the countries reflect an inelastic relationship between oil revenues and defense spending (see Table 1). During periods when large reductions in oil revenues occurred, the governments either increased their defense spending or at least slowed their defense spending at a lesser rate than that of the fall in oil revenue. In many cases, oil revenue and defense spending demonstrated a negative relationship, with the nations suffering falling oil revenues. Similarly, on occasions where oil revenues increased, defense spending usually increased at a higher percentage rate than the rise in oil sales. In both situations, the governments appeared to shelter defense spending from the adverse economic conditions facing the nation. This might indicate that oil revenues are the main determinant of the scale of defense spending, but current or past defense spending is not a good forecasting tool to tell how the nation will use its oil wealth in all conditions. A broader understanding of each nation's interests could explain the motivations to increase or decrease defense budgets.

Nation	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Iran	IN	IN	IN	IN	IN	IN	IN	E	IN	E	E
Saudi Arabia	IN	IN	IN	IN	IN	IN	IN	IN	IN	U	E
Kuwait	IN	U	IN	IN	IN	IN	IN	IN	IN	IN	IN
Venezuela	IN	IN	IN	IN	IN	E	IN	IN	IN	IN	E
Nigeria	IN	IN	IN	IN	IN	E	IN	IN	E	IN	E

IN -Inelastic
E-Elastic
U-Unitary (i.e., rate of change for oil revenues = rate of change for defense spending)

Table 1. Oil Revenue Elasticity of Defense Budget Measures.

For example, some countries might base budget decisions on past economic performance. But bureaucratic processes and economic performance measures might not always coincide sufficiently to help government officials determine the proper parameters for a budget. In one source consulted for this monograph, elasticity calculations for oil revenues seemed to lag defense budgets by a year, in which case governments could consider past oil revenue sales for current defense budgets. The results largely reflected the same inelastic nature of the original calculations. Nations were still reluctant to reduce defense spending at the same rate as oil revenue reductions after at least a year of declining oil revenues.

Each nation experienced periods when defense spending was unaffected by its export oil sales. Military budgets remained at or near the same levels as previous periods. However, several countries had increasing defense budgets regardless of any oil revenue increase or decrease. Oil revenues and defense spending had a negative relationship. Defense spending increased while oil revenues fell. During the study period, the world saw oil prices increase, which would indicate

a long-term rise in incomes for the five countries. In nominal terms, spot crude oil prices jumped from $14.36 per barrel in 1998 to $91.69 by the end of 2007. Oil prices, adjusted for inflation, almost quadrupled from 1998 to 2007. In 2000 and 2001, the world economy did suffer from a softening of consumer demand. The dot.com bust of imploding information technology firms and global downturn did reduce the demand for goods and services, including imported oil. Despite these downturns, oil-exporting countries kept their focus on the long term and saw a bright future selling their wares that may have influenced their decision to maintain their defense budgets at pre-bust levels. OPEC countries could look to nations like India and China, who would continue to demand more crude oil to fuel their emerging industry and consumer needs.

Chinese energy demand has tripled since 1980, approaching the U.S. level of consumption.[16] China's economy continues to be an energy-intensive one that requires more oil to produce one dollar of GDP relative to other comparable industrialized countries. In 2002, for example, China required 0.23 kilograms of oil to make a product that in lower- or middle-income industrialized countries would take only 0.15 to 0.25 kilograms for the equivalent product.[17] China's export-driven economy, consumer demand for petroleum, pollution concerns from reliance on coal, attempts to switch to other energy sources, and energy inefficiency will help ensure a robust Chinese market for oil-exporting nations, thus assuring their ability to expand defense budgets.

Rising prices and increased demand for energy provide oil producers several opportunities and challenges. Reliance on foreign energy sources by other nations creates a steady stream of oil business

today and into the future. Foreign dependence allows oil exporters to demand and get increased prices, whether due to limited supply or increased demand. This revenue allows the producer nation to fund numerous essential programs. Not only does the enhanced income fund defense programs, but it also allows for a wider expansion of programs to ensure that the government upholds the nation's social welfare contract that tends to dispel public discontent with the government. But greater wealth may also bring increased demand for a sharing of resources among the population. Along with these demands, the public might look for greater transparency and a greater voice in the political process, demands that the government may oppose. Populations which are accustomed to improving standards of living during these times of prosperity may become passively compliant in the face of their government's actions, but during times of oil price decreases could come to question government decisionmaking and demand a greater part in national policy determination.

Reliance on oil or other valuable natural resources can provide an avenue leading to future economic riches. How the nation spends and distributes its wealth may well determine how it develops economically and politically. These decisions will also shape spending enabled by future oil exports as well. Authoritarian governments of small nations with few democratic institutions may use their oil wealth to ensure their continued survival in power at the cost of the public's welfare and basic freedoms. Defense and security spending become the main objective to retain control, and the government must ensure funding for this function regardless of economic conditions. Governments that could have used oil revenue for

economic development and diversification might have found those to be a better solution for reducing public clamor for improved standards of living—far better than expanding their military capability to repress the clamor.

But governments of oil-exporting nations have other, often overriding, reasons to spend their wealth for defense and security. Many of these reasons do not involve the level of oil revenues. Bureaucratic politics, careerism, partisan advocacy, and other factors may cloud decisionmaking in the process. Oil prices and thus revenue can increase or decrease, with defense spending mimicking the rise and fall of such revenues. In this monograph, some of the largest oil-exporting nations were not constrained by decreased oil revenues. On the contrary, defense spending frequently increased while oil revenue fell. In some cases, oil revenue rose, yet the rate of defense spending rose even faster. Some of the reasons appear to be bureaucratic. Procurement activities require extended funding, such as aircraft purchases. Other reasons include using oil revenue to secure good relationships with other nations and developing an industrial base. Finally, a number of countries face severe security threats, internal and domestic, such that the country must continue to rely on a high level of defense spending to thwart an actual threat to the nation. Let us turn now to our five individual cases.

Saudi Arabia.

The Kingdom of Saudi Arabia is the world's leading oil-producing country and possesses the largest proven oil reserves. Saudi Arabia also has the largest defense

budget of all five countries studied. The government has control over its oil reserves in terms of ownership of the natural resources, state-owned enterprises that operate the extraction equipment, and oil drilling lease rights. The Saudi delegation frequently dominates OPEC oil price and production determination meetings that guide oil market direction. Saudi Arabia also has the biggest GDP of all other nations in the region, and has enjoyed years of significant oil exports to accrue sizable foreign earnings and investments. Given the Kingdom's wealth and earning ability, defense budgets have increased in the last 4 years of the study (2003-07) by an average of 17.35 percentage points per year.

Oil revenues accounted for 26 percent of the Saudi government's budget. Greater wealth has also brought a rising standard of living among Saudi citizens. Although the government provides some jobs, income distribution appears skewed among the population. Some citizens have questioned future employment prospects and the lack of employment opportunity due to a largely oil export-dominated economy. If citizens are not supported by government positions, the monarchy, or the petroleum industry, then there are few opportunities for viable careers. Discontent among some Saudi citizens has led to a rise in distrust of the Saudi government. Some government critics have linked these conditions to the rise of radical Islamic factions and potential complicity of Saudi citizens in the September 11, 2001 (9/11) attacks.[18] The Saudi government response has been to crack down on extremist groups, limit certain forms of civil expression, and strengthen a number of internal security measures. The Kingdom has suffered several suicide bombings, attacks on oil production infrastructure, and kidnappings by terrorists. Faced with potential internal

threats from radical militants and an external rival like Iran, the government needs a large and modern defense and security apparatus. Oil revenues provide a means to fund programs that support these measures. Additionally, oil and defense provide a secure base of employment. Increased defense spending allows the government to fund a politically secure national guard that supports the government, provides security and jobs, and may reduce the demands by certain groups who seek change within the government.

Saudi Arabia has used its oil wealth to fund defense and educational programs. During the mid-2000s, Riyadh increased spending on education to improve the technical skills of the population so as to counterbalance the influence of radical religious schools.[19] Increased education could offset some of the effects of extremist religious thinking. The government has focused an increasing effort towards enhancing the public's technical training and basic skills. Higher education may pose some difficulties. An educated public, with access to foreign ideas and concepts regarding greater transparency and governance, may someday create a more difficult problem for governments to combat than an external security threat. A greater population of educated individuals may spawn greater demand for the freedoms and cultural norms of the West. Calls for greater government restrictions on debate of national policy can encourage radical elements of society to voice and act upon their discontent. These acts may create more internal security concerns than any external threat. However, Saudi Arabia still faces many potential security issues from outside their borders.

One of the major external security threats to Saudi Arabia comes from Iran. The Islamic Republic of Iran is

a growing military, regional, political, economic, and religious rival to Saudi Arabia. After the fall of Saddam Hussein, Iran benefited from a weakened Iraq that no longer offers a direct physical threat or possesses the capability to spread Iraqi influence in the region. Iran now has on its western border this weakened enemy that is trying to rebuild itself despite great civil unrest. Tehran has aided Shiite factions opposed to reconciliation efforts by the Iraqi government. If successful, Iran's supporters in Iraq could come to dominate the Baghdad government and allow Tehran's influence to sweep across the area and pose a real threat to the Kingdom of Saudi Arabia, one of the leaders in the region and the Arab world. Iran's drive to build nuclear weapons and ballistic missile technology provides a means to strike not only Israel, but also other Middle Eastern cities. Iranian efforts to launch a satellite into orbit and continued test launches provide ample evidence of its ability to develop its ballistic missile capability. Despite threats of sanctions, the Iranian government continues to make major weapons purchases. An Iranian military that came to dominate the Persian Gulf could also threaten oil deliveries not only by Saudi Arabia, but also other Gulf states.

Iran also challenges the Saudi Arabian government in other ways that have security implications. An ideological conflict between the two nations for influence in the Middle East has widened. Iran has dabbled in the Palestinian and Lebanon issues, led a chorus of anti-American rhetoric, confronted Israel, and pursued other actions to demonstrate its leadership in the pan-Arabic world. The Iranian government called for the overthrow of Sunni monarchies, like Saudi Arabia and Saddam Hussein's Iraq, in 1979.[20] Iran's ability to sell oil at a price and volume that ignores

OPEC quotas represents another challenge to Saudi Arabia's leadership. A rising militant Iran can threaten the existence of the current Saudi government in many ways, especially militarily.

Although Saudi Arabia outspends Iran on defense, Iran's military, in terms of personnel, outweighs Riyadh's military forces. The Saudi Arabian government has substituted costly technology for large fielded forces due to its small population and great geographic size. Aircraft, military vehicles, naval vessels, and other capital investments dominate Saudi acquisitions; these purchases represent long-term investments that require a commitment of decades. One analyst reviewing Saudi defense budgets noted that the government's security needs far outweigh any adverse impact on the annual national budget.[21] Because of Iran, and also potential terrorist attacks, the Saudi government will provide security in the country regardless of the oil revenue level.

Iran.

Iran's ability to supply oil provides resources to fund weapons development and supports the government's ability to challenge the United States politically in the region.[22] Exporting oil serves several purposes. First, it provides a stream of income to support governmental operations. This includes funding for military and security activities. Second, selling oil to nations that have severe energy concerns might woo them to embrace Iran's side in its conflict with the United States. Countries that receive Iranian oil may be less willing to support American-led efforts for sanctions or other actions against Tehran. Third, Iran could deliver oil to states that are already under

sanctions or other international restrictions, such as North Korea. This would serve to sustain anti-American states capable of distracting Washington, while Iran continues unfettered to pursue its own foreign and domestic policy interests.

Tehran's use of oil as a weapon has been quite innovative. Iran has used its oil revenues to underwrite military operations and build a military capable of threatening its regional neighbors, including Israel and American military bases. These efforts include purchasing military and nuclear technology from Russia, China, Pakistan, and North Korea. Iran's drive for nuclear weapons has been a vital program in the country's national security strategy. Its effort to produce nuclear weapons and a delivery system requires a large and constant inflow of revenue. Additionally, Iran has attempted to use oil as a political weapon. Tehran has reduced oil exports to those states supporting sanctions for nuclear fuel violations.[23] Iran's threats to cut oil also provide a potential economic weapon against oil importers. If Iran slashed its petroleum exports, then world oil markets would panic with an accompanying steep rise in prices. Similarly, under conditions of oil excesses, large oil exporters like Iran can afford to sell petroleum at relatively low prices and use its ability to increase sales volume to make up the difference. Iran can also threaten to shut down the Strait of Hormuz or conduct combat operations in the area, much as it did in its war with Iraq in the 1980s, which would cause disruption of oil supplies and increase oil prices. The result of these actions could destabilize Western economies.

Iran, like Saudi Arabia, relies heavily on oil exports.[24] Approximately 70 percent of the government's operating revenue comes from oil sales.[25] Although the

sales volume is less than half of Saudi Arabia's, the level of revenue is enormous. The bulk of its available trade earnings go to support a defense budget. However, Iran's restrictive government control of economic and financial activities has hurt domestic business.

Tehran directs and is responsible for financing much of the economic growth in the nation, with its heavy reliance on oil revenues for defense, making defense more elastic than other nations. Iran's large population and limited economic growth potential have created major problems with unemployment and underemployment among its youth. Government restrictions on severance, wages, and other labor practices make hiring new employees difficult. Young adults with college educations find career opportunities limited. Although Iran exports oil and natural gas, it requires increasing domestic energy supplies for its own population. An additional source is nuclear energy. Iran can fund its nuclear energy programs and simultaneously continue its efforts to build nuclear weapons. This effort appears to be the government's highest priority in 2009.[26] Such maxed-out economic commitments place a constraint on Iran's freedom of action.

Iran's oil supply gives Tehran an extra advantage that it can use to advance its military expansion. Quid pro quo agreements to exchange oil for weapons technology or systems, especially to energy-starved countries, gives Iran especially useful leverage. This leverage can be employed to acquire capabilities and influence from countries that do not have sufficient foreign exchange or nonmilitary tradable goods or services to purchase oil. In recent years, the People's Republic of China (PRC) has been a major exporter of goods to Tehran and importer of Iranian oil. This

trade provides an avenue to exchange technology, goods, and services between nations that might have a common goal of thwarting U.S. influence in the Middle East and other areas. But the reliance on oil trading is also a limitation to Iran's power. If Tehran shuts down the Strait of Hormuz, creates a war zone of the Persian Gulf, or makes a military or economic target of it, then it will severely limit its ability to sell its oil to its friends or the free market. The Iranian government can create problems for the United States, but it must carefully weigh its options and avoid situations that would include the destruction or damage of its own economic means to achieve its national interests.

Kuwait.

To explain Kuwait's oil revenues and defense spending, we confront a set of circumstances different than those of the other Middle Eastern countries. "Defense spending," as used here, includes economic development.

In August 1990, Saddam Hussein invaded Kuwait. The Kuwaiti government needed the United States and many coalition partners to liberate the country from Iraq. Today, the Iraqi government offers little threat to Kuwait. However, an Iraqi civil war could create severe security conditions along the border. An ascending Iran could also flex its military muscles by threatening to close the Strait of Hormuz and attempt to create a regional hegemony. Terrorists could attempt to destroy the Kuwaiti monarchy. Iran could also attempt to seize Kuwaiti territories.

The nation has spent much of its oil revenues diversifying its economy. The government has developed economic trade zones to lure business

from Asia, Europe, and other areas. A new economic trade hub, Silk City, will cost an estimated $75 billion to complete.[27] Increased trade and commerce may require additional security to assure companies and financial institutions that their investments are safe. Defense spending can provide a visible demonstration of Kuwait's assurance of security. Defense spending is also a means to develop the economy. Some countries, like Kuwait's neighbor, the United Arab Emirates (UAE), also use defense spending as a means to improve domestic job skills by requiring foreign defense contractors to use the local industrial base for labor, components, and assembly.[28]

The composition of Kuwaiti defense spending determines the size and character of the budget. Increased Kuwaiti defense spending serves to compensate for the small size of the armed forces. The total Kuwaiti active force is about 15,500 personnel, with another 23,700 reservists. This small force could not withstand a serious attack by Iran. The Iranian active forces number over one-half million personnel with a reserve force of 350,000. The Kuwaiti Ministry of Defence tries to compensate for the personnel disparity through the purchase of advanced weaponry. Kuwaiti defense forces aim to meet such enemy threats with technology entailing extensive and expensive acquisitions. For example, a missile defense system is required to defeat an Iranian ballistic missile. In 2007, Kuwait purchased 80 advanced Patriot-3 missiles plus upgrade kits for existing older generation Patriot missiles.[29] These systems could defend the country's airspace and provide a limited shield against a ballistic missile attack. Kuwait also recently purchased the French *Rafale* fighter, naval frigates, and additional anti-missile defense systems.[30] Other purchases

include tube-launched, optically-tracked, wire-guided (TOW) anti-tank missiles to replace older versions of the existing system. Kuwait has also sought bilateral defense cooperation agreements with a number of countries, to include Turkey, which may aid it in a time of national emergency. Kuwait's purchase of weapons from large western nations also solidifies international support during a crisis, improves its ability to use modern weapons technology to offset its numerical disadvantages, provides for an opportunity to expand a growing industrial base, and, by sacrificing its oil revenue, demonstrates its determination to resist regional threats.

Kuwait also has stressed defense cooperation with many of its Persian Gulf neighbors. In August 1990, many small Gulf states and Saudi Arabia joined the U.S.-sponsored alliance to restore Kuwait after its invasion by Iraq. This alliance also sent troops to Kuwait in 2003 just before the U.S. invasion of Iraq. A protective military force of over 8,000 from Saudi Arabia, Qatar, Bahrain, Oman, and the UAE deployed to Kuwait.[31] High defense spending will probably continue, despite weakened oil sales, due to Kuwait's fear that its sovereignty is in jeopardy.

Venezuela.

Venezuela has benefited greatly from its natural resources. Its windfall oil profits deriving from worldwide economic growth and energy demand have allowed Caracas to fund many government programs and activities. Venezuelan oil became a powerful means for President Chavez to underwrite a host of programs to secure populist support. These programs included expanded infrastructure plus social and

economic programs. The Venezuelan government has also attempted to limit American influence in Central and Latin America. Despite tensions between the two countries, Venezuela continues to be one of the largest oil exporters to the United States. Caracas has used its oil revenues to expand its military capabilities; support anti-American candidates, causes, and parties that are close to its ideological base; purchase weapons from Russia and China to demonstrate its independence from Washington; support Cuba; and assist movements to destabilize and replace governments in the region.

Caracas fears external and internal foes that appear to threaten the government. Chavez has accused the United States of meddling in its internal affairs on several occasions, including support for a military coup attempt in 2002 and earlier. After the coup attempt, which removed Chavez from power for 24 hours, the Venezuelan government replaced several military leaders, and the government clamped down on political dissent. He continued his anti-American rant, culminating in the forced removal of the U.S. ambassador to Venezuela in September 2008. Chavez had accused Washington of planning another plot for his overthrow by Venezuelan military officers.[32] Chavez has continued to make demogogic claims about American-led efforts to unseat or disrupt his government since his rise to power in 1998.

The country has also suffered internal problems, including several labor strikes, worker and consumer boycotts, complaints about lack of political freedoms, and protests over state seizures of businesses. Chavez nationalized the private oil industry and replaced many experienced oil and management workers because of their opposition to this seizure. With veteran workers gone and reduced capital expenditures in infrastructure, Venezuela's oil production has fallen.

Oil revenues increased, but only because of oil price increases. Continued loss of private industry to the state and adoption of a Cuba-styled economy will create more discontent among the business and middle classes. This state of affairs has provided a rationale for supplying more funds for defense and security so as to quell domestic dissent and foster nationalistic fervor for his Bolivarian revolution against an external foe, the United States.

President Chavez has successfully used wealth from oil revenue to fund an extensive social welfare and jobs program to secure populist support. In February 2009, Chavez was able to overturn efforts by opponents to place term limits on the presidency. This election will allow him to run for president again after his current 6-year term in office ends in 2013. Chavez has used subsidized food, free health care, government jobs, inexpensive subsidized gasoline (at approximately 10 cents per gallon), and other oil revenue-funded programs to secure public support.[33]

Oil processing slid in 2009, reducing oil revenues. If oil prices fall, Chavez's ability to provide funds to pay for social spending will weaken, perhaps increasing domestic opposition. President Chavez may face real difficulties in continuing these subsidies. Despite the reduction in oil revenues in 2009, Chavez has expanded the Venezuelan military. He has complained about neighboring Colombia granting basing rights to Washington. In turn, Bogota claims that Caracas has supplied arms to the macro-terrorist Revolutionary Armed Forces of Colombia. Such claims and counterclaims have fueled tensions across the border. The Venezuelan military will expand to include militia groups, new riverine forces, reserve unit conversions to combat battalions, and doubling the armored forces. On July 28, 2009, Chavez signed a deal with Russia to

purchase T-72M tanks and 2S25 self-propelled anti-tank guns.[34]

Chavez requires a strong security force. It must demonstrate to a domestic and regional audience an ability to defend Venezuela's sovereignty against an American invasion; provide aid to Colombian guerrillas; extend support to regional socialist and revolutionary groups and governments; ensure domestic security and combat internal opposition; and maintain loyalty among its members. Spending on military weapons acquisition programs from Russia and other nations demonstrates some independence from the United States and provides a means to extend Venezuela's image and legitimacy as a growing socialist state. Increased defense spending also provides assets to support a number of political movements within Central and Latin America that are sympathetic to Chavez or that might emulate his government as a model.[35]

If Chavez wants the capability to defend the Venezuelan government against potential coup attempts, then he must maintain generous spending on defense or security. He must extend defense spending regardless of oil price changes and their effect on revenues. This might explain the inelastic relation of oil revenues to defense spending in Venezuela. Although Chavez has threatened to stop oil sales to the United States, his policy has in fact been to continue them. Venezuela is normally among the top 10 oil exporters in the world and was the fourth largest oil exporter to the United States in 2008. Continued threats to reduce oil sales appear to be hollow, given the mutual dependency that Venezuela shares with the United States. Ironically, as the Caracas government continues to spew anti-American rhetoric about Washington's

alleged interference in Venezuelan and Latin American affairs and threatens to sever oil sales, the U.S. market continues to expand. The U.S. oil market, in fact, offers Chavez the means to continue his programs.

The Venezuelan government has tied its foreign and domestic interests to the U.S. addiction to oil. Venezuela produces heavy crude. This type of oil contains more impurities than Saudi Arabian "sweet light," requiring more intensive refinement by U.S. buyers. These special refineries are more expensive to operate, and this requirement has reduced the selling price for Venezuelan oil. The Chavez government has also invested heavily in such refineries and has established a large distribution system under the CITGO brand. Alienating Washington may create situations where Venezuelan assets are vulnerable to sanctions or other limits on their operation.

Like Iran, Venezuela's ambitions are somewhat curbed by its dependence on selling oil. Venezuela's reliance on American markets to purchase its heavy crude can limit options that Chavez might take to harm American interests, particulary economic interests.

Nigeria.

Nigeria is rapidly becoming one of the world's leading oil producers. Washington has great interest in the Nigerian government's political stability since this West African nation exports about 20 percent of the total of U.S. oil imports. World energy demand has made Nigeria, a country with the second largest proven oil reserves in Africa, fertile ground for exploration in the Niger Delta and the Gulf of Guinea. Nigeria contains the largest African natural gas reserves. Petroleum exports provide up to 95 percent of its export earnings and 85 percent of its government revenues.[36]

Oil has provided an economic boon for the government. However, not all of Nigeria's population has benefited from this wealth. Oil industry plant and operations have displaced many residents in the Niger Delta and have altered the environment. Corrupt government officials and misplaced policies have destroyed the social and economic coherency of the Niger Delta inhabitants' lifestyles. The government has seized land from residents for oil exploration. Pollution has destroyed fisheries and agricultural lands. Economic returns from oil have largely bypassed these residents, reaching only the hands of the government and the wealthy. These trends have created a recipe for insurgency, leading to large areas of instability within the delta.[37] Insurgents have seized property, damaged oil pipelines, and attacked government forces. These activities have threatened the security of oil exploration and have limited economic development within the region.

Nigeria has experienced significant tribal differences that led to civil war. Tribal differences frequently transcend political borders. Nearby Liberia, Côte d'Ivorie, and Sierra Leone have had coups, civil war, and tribal warfare. Nigeria has witnessed election fraud, civil war, coups, growing schism between Muslim and Christian factions, political corruption, crime, and border disputes. Military-led coups have strained relations among the civil government, the public, and military members. The Nigerian government must contend with a number of diverse security issues that require defense spending regardless of the size of oil revenue.

CONCLUSION AND POLICY IMPLICATIONS

Oil is a powerful weapon with significant economic, industrial, and military impacts. Countries that control oil or other limited key natural resources appear to have a great advantage over import-dependent nations. International sales of such resources not only provide wealth to the owners, but can also generate significant influence over buyers. Oil wealth provides the means to finance the wherewithal for a country to realize and protect its national interests. Exporters can negotiate agreements with potential importers for obtaining political support or brokering various forms of compensation. During times when a resource is in high demand, exporting nations appear to have the capacity to expand their defense capability owing to enhanced revenues.

Policymakers who reach a single solution in understanding the dynamic relation between oil revenues on the one hand, and defense spending on the other, may be oversimplifying the situation. Observers may make the correlation that the level of oil revenue drives defense budgets. Generally, increased oil revenues do result in higher defense budgets. Logically, in some people's minds the converse must also be true. Falling oil prices will force reductions in defense spending. Poor economic times and reductions in oil demand will limit the ability of countries to increase their military capabilities and lessen the threat to their neighbors, or so it is thought. Linkage between oil revenue levels and levels of military expenditures, however, appear weak, meaning that attempts to limit defense spending by tinkering with a producer's oil revenues are likely to fail. Perhaps first evaluating the root cause of the impulse

of nations to expand their military force structure and capabilities—and then acting on that root cause—may be a better alternative than direct attempts to limit defense expenditures by these nations. Domestic and foreign rationales for boosting defense spending might address the issues quicker and more effectively for the United States. Diplomatic, political, and informational tools could focus on calls for internal reforms that could reduce tensions between governments and their publics. Diffusing regional rivalries can also reduce tensions that might stop an arms race, especially a race that involves nuclear weapons. Long-term economic development and the weaning away of states from sole reliance on natural mineral extraction could also diversify the economies and broaden opportunities for these nations.

Policies to limit oil revenues in particular countries so as to ensure a reduction in defense spending may do more harm than good. Disrupting the free flow of oil may cause economic disruptions at home and abroad. Perturbations of oil imports will probably induce traders to speculate even more feverishly on future supplies. This will raise the world oil prices that will in turn create economic disruptions and possibly even increase revenues to the very countries targeted by the policy. Unfortunately, oil importers have few legitimate options to curb oil exports and prices controlled by sellers, especially during times of limited global oil supply. Forcing oil exports may artificially pit Washington against other oil importers. Reducing defense expenditures in certain regions may help the common good of nations in a very general sense. But we should constantly remind ourselves that in cases where oil revenue did shrink, defense budgets increased or decreased at a lower rate than the fall in

revenues. Perhaps future study of oil price growth, long-term contracts, a regional threat, etc., will be able to explain the persistent strength of maintaining defense spending.

A more prudent option is to evaluate each individual case to determine why defense spending seems entrenched in certain countries. A particular country may have a perfectly legitimate reason to maintain large defense expenditures. Fear of attack or an internal insurgency from many foes may be at the core of the issue. In this case, the United States and regional allies may try to support the nation. Increased defense expenditures could also be a signal that the nation's government feels that the United States is not willing to do more or that the nation's government does not desire the public perception of accepting aid from Washington.

Countries that spend oil revenues to acquire the means to threaten neighbors or others outside their region, such as ballistic missiles with a WMD, may necessitate a concerted effort on the part of western nations to stem their efforts. Gaining international agreement to limit access to technology and critical components may be more effective than unilateral actions. The need for oil may force many nations to choose between support for international sanctions and their own self-interest. Washington's ability to secure solid agreement and cooperation for any policy that sanctions a targeted nation depends on broad mutuality of interests.

Thus, before the U.S. Government implements policies that attempt to restrict an oil exporter's ability to sell oil, there are many factors to consider. Certain conditions may nullify the apparent advantage that oil exporters appear to possess. These countries may

have an upper hand in owning oil resources, but without a buyer of their product, they too may suffer. For example, as we have seen, Venezuela makes many threats to halt oil sales to the United States, yet the United States continues to be the largest consumer of Caracas' oil exports. If Venezuela ceases petroleum sales to America, then it will cripple its ability to raise foreign exchange. Almost all exporting nations must ensure the free flow of oil over the long term, unless they have made careful preparations for weathering their threatened boycott or have stockpiled foreign exchange to compensate for their withdrawal from the market. An unquenched thirst for oil revenue that guarantees a flow of foreign exchange to fund military budgets or maintain their citizens' standard of living forces oil exporters to do business with enemies. Even if the oil-exporting country limits business with an enemy, oil traders frequently resell or process oil from many oil producers, thus making traceability problematic. High oil prices may also spur importing nations to implement policies to reduce their dependence on foreign energy.

This call for long-term changes, if successful, could seriously erode the ability of oil-exporting countries to maintain their social contract with their publics into the future. Oil-producing nations must also recognize that if the price of petroleum becomes too high, then a global recession may result. In that case, oil purchases may be reduced, foreign investments may depreciate, the domestic oil industry may face decline, and alternative energy sources may become economically competitive. Such consequences could create significant domestic discord.

In each of the five nations we have examined, the wealth generated by oil sales also has sown seeds of discontent. One option the United States and other

nations can implement is to improve universal access to information. Authoritarian regimes that want to challenge American interests or thwart its regional goals may face a more significant challenge to their government, i.e., internal discontent. In a rapidly changing era of information, despite controls by governments, great wealth and its distribution become the subject of public policy debate. Populations, despite controls, can gather information from the internet, global news media, study abroad, or travel financed by oil revenue. Citizen dissenters demanding greater transparency for governance, advancement of human rights, and cultural liberalization in the country can provide a focus for organizing disparate groups. A free flow of information can also allow dissenters to compare the standards of living and ways other governments solve public policy issues with their citizens. The United States and other nations may need only to provide current, accurate, and unbiased information within the oil-exporting country. Despite efforts to control the internet and information, authoritarian governments like the PRC, Iran and others cannot completely limit access to all information.

Depending on the country, purchasing military equipment may not be a bad transaction for oil importers and may be a policy to pursue. Selling raw materials to gain foreign exchange to purchase finished defense goods or services costs the oil-exporting countries much national treasure. Countries that produce jet fighters, anti-tank weapons, and similar expensive products provide extensive value-added labor and technology to transform raw materials into a product. Oil exporters pay for these efforts, but frequently they earn the foreign exchange by selling limited value-added commodities (e.g., refined oil). Oil-importing countries may even gain value by selling these defense

products despite buying expensive oil. Oil-exporting countries may need to increase the volume of their oil sales, spend surplus foreign exchange, or attempt to raise oil prices.

Limiting the oil revenues of certain countries to reduce their defense spending may result in addressing only symptoms and not the true reasons for large defense budgets. Unlike a unified energy program conducted by the U.S. Government, these state-specific policies need to be tailored for unique conditions facing a particular oil-exporting nation. A one-size-fits-all policy would probably fail. Changing the behavior of oil-exporting governments is a difficult task. Dealing with governments with different rationales for retaining large, inelastic defense spending will tax policymakers' creativity. However, if the United States can reduce the fear, of the oil-exporting nations, of an invasion by a neighbor and restrain ambitions to threaten regional rivals, then defense spending might fall and limit the demand for high-cost, long-term defense acquisitions. Of course, replacing a government that is used to receiving, distributing, and controlling royalties may take even longer than to persuade it to share power with its public, create a more transparent process of determining resource allocation, or reduce corruption or cronyism.

Washington has a variety of options to influence both governments and international audiences. If nations fear an arms race between neighbors, then Washington could sponsor arms reduction talks and offer diplomatic solutions, guarantee security by stationing military forces nearby to stabilize areas, elevate the problem to a higher international body for consideration, etc. Government policy should not center on undifferentiated policies built on the assumption

that all producers act in exactly the same manner or are motivated in the same way. Attempting to characterize and model a nation's leadership behavior may thus be far more difficult than previously thought.

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