THE DEATH OF RENTIERISM

IN THE KINGDOM OF

SAUDI ARABIA

by

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ABSTRACT

The premise of this research is to determine when the end of rentierism will occur in the Kingdom of Saudi Arabia as well as what actions the government is taking to prepare for it. After compiling population growth, domestic consumption demand, and depreciating oil production into four separate future predictive scenarios, the results are that the end of rentierism will occur between 2022-2033 in Saudi Arabia.

Analysis on the social, economic, and political landscapes was conducted to illustrate the current social and economic obligations that the government currently has. Alternatives to petroleum were analyzed, resulting in the finding that there are no viable natural resource alternatives to oil in order to maintain rentierism.

The primary obstacles to preparing for the death of rentierism were found to be the extreme dissent within and between the House of Saud and the religious establishment, and the lack of stated goals with timelines and accountability for implementing economic diversification goals.

“My grandfather rode a camel.
My father rode a camel.
I drive a Rolls Royce.
My son flies a jet plane.
His son will drive a Mercedes.
But his son will ride a camel”

Sheikh Rashid al Maktoum
Emir of Dubai

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ABBREVIATIONS

ARAMCO	Arabian American Oil Company
CME	Chicago Mercantile Exchange
EIA	U.S. Energy Information Administration
ERI	Energy Research Institute
ESIS	Electronic Share Information System
EXPEC ARC	Exploration and Petroleum Engineering Center
FMS	Foreign Military Sales
GAO	General Accounting Office
GCC	Gulf Cooperation Council
IFP	French Petroleum Institute
IMS	Idea Management System
JORC	Joint Ore Reserves Committee
KA-CARE	King Abdullah City for Atomic and Renewable Energy
KACST	King Abdul Aziz City for Science and Technology
Mbd	Million barrels per day
MENA	Middle East North Africa
MGS	Master Gas System
MRC	Maximum Reservoir Contact
NGIT	Natural Gas Investment Tax

NGL	Natural Gas Liquids
OAPEC	Organization of Arab Petroleum Exporting Companies
OPEC	Organization of the Petroleum Exporting Countries
POWERS	Parallel Oil, Water and Gas Reservoir Simulator
R&DC	Research and Development Center
SABIC	Saudi Basic Industries Corporation
SAMA	Saudi Arabian Monetary Authority
SAMBA	Saudi Financial Group
SAO	Security Assistance Organization
SATORP	Saudi Aramco Total Refining and Petrochemical Company
SBG	Saudi Binladin Group
SEC	U.S. Securities and Exchange Commission
SPE	Society of Petroleum Engineers
URR	Ultimate Recoverable Resources
US	United States of America
VLCC	Very large Crude Carriers
WEA	Wind Energy Association
WPC	World Petroleum Congress
WPOP	World Peak Oil Production
WTI	Western Texas Intermediate

INTRODUCTION

Sheikh Rashid bin Saeed al Maktoum, former Emir of Dubai, was fond of the saying,

"My grandfather rode a camel.

My father rode a camel.

I drive a Rolls Royce.

My son flies a jet plane.

His son will drive a Mercedes.

But his son will ride a camel"

Sheikh Rashid bin Saeed al Maktoum ruled for 32 years from 1958 until his death in 1990. Oil was discovered in the United Arab Emirates in the year 1966 and production began in 1971. Sheikh al Maktoum has shown the most foresight of any leader in the Middle East and recognized early on that he must develop the economy of Dubai so that it could survive after the end of oil production. His proverbial saying about his great-grandson riding a camel was his way of elucidating the day when oil revenues would run out and the desert would reclaim his people.[1] In an effort to prevent this prophecy, the Sheikh was the driving force behind a number of major infrastructure projects to promote Dubai as a regional hub for trade. While other Gulf leaders were squandering their

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[1] Gluckman, Ron. "Hong Kong of the Desert?" www.gluckman.com/dubaibiz.html (accessed 1 June 2012).

money by building mansions and stockpiling munitions, Sheikh al Maktoum commissioned the building of Port Rashid, Al Shindagha Tunnel, Jebel Ali Port, Dubai World Trade Center, and the Dubai Drydocks. Dubai has since been called the 'City of Merchants' and when oil is exhausted, the strategic location of Dubai combined with its sophisticated trading network of ports, drydocks, tunnels, buildings, and airports, will remain unaltered and commercial activity will only continue.[2]

In January 2012, the IMD World Competitiveness Centre Index ranked the United Arab Emirates as the 16th most diversified economy in the world. The United Arab Emirates ranked higher in economic diversification than the 20th ranked United Kingdom, 39th ranked Turkey, and 53rd ranked Jordan. The only other Middle East country in the top 60 was Qatar, with a ranking of being the 8th most diversified economy in the world. The ranking is from 0-100 and the 60th ranked most diversified economy was Venezuela with a ranking of 31.45.[3]

The topic of this thesis is to examine how the Kingdom of Saudi Arabia is preparing for the end of rentierism. Saudi Arabia was blessed with the world's largest cache of oil deposits in 1939. The economic rents that the Kingdom generated has allowed the government to become a nearly pure rentier economy. Rentierism for Saudi Arabia includes the subsidization of benefits for Saudi Arabian nationals ranging from free healthcare and education to the government charging below market rates for commodities such as gasoline, desalinated water, and other forms of energy. The key to

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[2] Ibid.

[3] "The World Competitiveness Scoreboard." January 2012. http://www.imd.org/research/publications/wcy/upload/scoreboard.pdf (accessed 4 June 2012.)

preparing for when the government no longer receives revenues from oil is the construction of a diversified economy. Saudi Arabia is not one of the top 60 countries with a diversified economy. They are not officially ranked, but they are somewhere between having an economic diversification ranking of between 0- 31.45, according to the IMD World Competitiveness Centre Index.

While the United Arab Emirates has been called the 'City of Merchants' and the 'Hong Kong of the Middle East,' Saudi Arabia has no such title or is anywhere close to being the trading hub into which the United Arab Emirates has evolved. As the first chapter of this thesis will show, Saudi Arabia was a major trading gateway between East and West prior to the discovery of oil. Most merchant trade was discontinued and even the Bedouins moved into city centers after the discovery of oil and subsequent subsidies began to be distributed. With revenue from oil, the House of Saud did invest into infrastructure and rapid development did occur, but between economic corruption, dissent between the religious establishment and the Royal Family and a population that would rather import labor than do the work themselves, Saudi Arabia has been a country completely reliant on oil since the first dollar of oil revenue was earned in 1939.

After compiling four statistical models to determine when domestic consumption will equal domestic production, the result is that the most likely outcome is that Saudi Arabia will cease to generate government income from oil between 2022-2033.

The term of 'the death of rentierism' is used to indicate the time when the government is no longer able to rely on the income from oil as a means for running the government. The premise of this research is to determine what actions the Saudi Arabian government is taking to prepare for the end of income from oil, the obstacles for reaching

the goal of diversification and the research will ultimately conclude that the country is not, in fact, adequately prepared for the death of rentierism.

THE FORMATION OF A KINGDOM

In order to predict the future of rentierism in the Kingdom of Saudi Arabia and to determine if they are prepared for the end of it, the past must first be understood. Saudi Arabia, the birthplace of Islam, has a unique history not only within the Middle East, but also within the global framework. The Prophet Mohammad was born in the city of Mecca into the Quraysh tribe in A.D. 570, and forever shaped the area now known as Saudi Arabia.

Prior to the birth of Islam, the city of Mecca was located at a commercially advantageous position. It sat at the juncture of the most important trade routes between Syria and Yemen. Because of the fear of raids by caravans and the inhospitable weather, commercial activity was limited until the Meccan merchants formed alliances with the Bedouin tribes. The Meccan merchants agreed to use the Bedouin-owned camels for a fee, in exchange for the allowance of the caravans to visit new and undiscovered areas and markets inside Arabia. With the alliance between the Bedouin tribesmen and the Meccan merchants, international trade was able to commence.[1]

The Meccan economy began to develop, and the merchants concentrated their capital within the area of the local markets. The power of the Meccan merchants increased, and wealth was soon a discernible attribute of the socially influential merchants. The wealthy merchants evolved from the leaders of the tribes into the leaders

of their communities. They were placed at the top of the social ladder, and were able to control the political dealings of the city.[2]

Until the birth of the Prophet Mohammad, local tribesmen in Arabia had fought destructive wars in order to gain control of the region. After the birth of the Prophet, Islam captivated the Arabian Peninsula. Bedouin tribesmen ceased their fighting and found a common loyalty for the Prophet and Islam.[3] By the 16th Century, the city of Jeddah became the new commercial center for merchants and traders due to its natural harbor on the Red Sea. Thousands of *Hajj* pilgrims would descend on Mecca via the harbor in Jeddah every year, replacing Mecca as the main trading and transportation artery in Arabia. In addition to the influx of tourists visiting Jeddah every year, the city became the main import hub to the greater Arabian area. Jewels, spices, food, and textiles were imported through the Jeddah harbor. The citizens of Jeddah became completely focused on trade and commerce, not pursuing any type of manufacturing or trade that was not of direct and immediate necessity. Two types of citizens emerged: the sea faring people who built boats and cultivated pearls, and the people involved with international trade and traffic within Arabia.[4]

A few trading families emerged as the de facto social and political leaders of the communities. The tribal chiefs, or heads of the families, protected the movement of trade by collecting money and gifts from the local merchants. Violence by some of the rural tribesmen created problems along the trade routes, causing the heads of the families to organize a military style resistance to keep the trade routes safe. Contrary to typical and contemporary economic and social strata, the tribal leaders and family heads made less of a yearly income than the merchants they were protecting. The families thus turned to the

merchants for financial assistance. The relationship from this interaction between the tribal leaders and the merchants became so powerful it was impossible to break the trade barrier they had established.[5]

During this time in the 1500s, the Al Saud family emerged as one of these powerful ruling families in the town of Najd, near Riyadh. Najd was small, but as commercial trading increased and the city grew, the Al Saud family came to be well known. Their reputation as a protector of the trade routes spread, and they quickly became the most powerful family in Najd. The rise of the Al Saud family grew in harmony with that of their family friend, Muhammad ibn Abd al Wahhab, who was alive between 1703-1787. Muhammad ibn Abd al Wahhab and Muhammad ibn Saud became political and religious partners. They worked together and were bound by an oath to establish a state ruled according to Islamic principles. The relationship thrived because Muhammad ibn Abd al Wahhab vowed to spread the legitimacy of a purified Islam, and Muhammad ibn Saud vowed to undertake *jihad,* a religious war against nonbelievers, on behalf of Mohammad, for the purpose of advancing Wahhab's interpretation of Islam. By 1765 the two had established the brand of Islam now known today as *Wahhabism*. Through this partnership, Muhammad ibn Saud gained political authority over all of Najd and Muhammad ibn Abd al Wahhab gained religious legitimacy.[6]

By the 1800s, the economy of Arabia had evolved to include nomadic pastoral activities such as camel raising, camel grazing, growing cereals when rainfall permitted, fishing, pearling, and shipbuilding, among others. Export was limited to sheep, dates, camel hides, and horses. Imports consisted of essential commodities that people were unable, or unwilling, to produce in the Arabian Peninsula. Some local commodities that

were unique to the region included pottery, soaps, rugs, date packaging, and metalworking.[7]

At the beginning of the 1800s, the income of the Al Saud family was estimated to be approximately US$1,000,000 per year. The income consisted of the annual *zakat*, a religious tithe which was calculated to be 2.5 percent of each Muslims net worth, a tax on trading, booty from the caravans and wars, miscellaneous fines from citizens and traders, and the proceeds from the *Hajj,* an annual pilgrimage to Mecca expected to be completed by any-and-all able bodied and financially stable Muslim believers.[8]

By 1916, the Al Saud family was headed by King Abdul Aziz. His main personal source of income was camel trading with Syria, but after World War I, the commercial relationship had dwindled. He was not generating enough revenue for the family to maintain and run the government that he had established within the greater reaches of Najd, forcing him into national and personal debt. In order to raise money, the family decided to conquer the city of Jeddah. Income from the prosperous merchant community, and an increase in Hajj revenues equal to US$56 per traveler, or US$22 million per year, buoyed the family's income level, pushing them out of debt. During the 1920s, Arabia's economy was poor owing to the lack of any domestic or international communication mechanisms, the absence of any natural resources, the dire shortage of international capital investment, and the low skill level and education of local labor.[9]

Everything began to change for King Abdul Aziz and the Arabian Peninsula when the Americans began to receive news that there might be natural resources in Arabia that were not already claimed. Prior to World War I, the United States, unlike the British, had

no interest in the Middle East. It was not until the issues of colonization and oil became important that the United States became interested in Arabia.[10]

In 1931, the first visit by an American to the Arabian Peninsula was by Charles Crane, a Chicago millionaire, philanthropist, world traveler, and former ambassador. The purpose of the visit with King Abdul Aziz was to explore Arabia for assets beneath the soil, namely water. Once there, Crane summoned Karl Twitchell to Arabia, who was a Vermont mining engineer and who eventually became the mining engineer to Jeddah. Twitchell was instrumental in drawing the attention of the American oil companies to the Peninsula's potential for oil. In 1932, King Abdul Aziz established the Kingdom of Saudi Arabia as a state with the help of al Wahhab and his religious *Ikwan* soldiers. Muhammad ibn Abd al Wahhab had organized a group of Wahhabi puritans, named the *Ikwan,* or brothers, who were fighters in the name of Islam. King Abdul Aziz had promised the Ikwan that if they helped him conquer the area of Arabia, he would protect and advance Wahhabi Islam within his Kingdom. The Ikwan complied and helped King Abdul Aziz conquer the area now known as Saudi Arabia. The Ikwan were successful at their attempt at conquering their fellow tribes and wanted to continue to spread Wahhabi Islam and create a Wahhabi empire inside the boundaries of Arabia as well as outside. King Abdul Aziz denied their efforts at Wahhabi expansion beyond the boundaries of Arabia, and beyond the boundaries of his control. The Ikwan attempted to battle King Abdul Aziz and his family and followers for denying them the right to expand. At the beginning of the Ikwan's rebellion, King Abdul Aziz consulted the *ulema,* or the religious clerics and scholars of Wahhabi Islam. The Wahhabi religious component and the ulema were the chief reasons for King Abdul Aziz's ascent to the throne, so he

protected the religious elite and sought their advice on political decisions within the country. The ulema consulted the Quran regarding the Ikwan's uprising, and they found that it is against the religion to fight against the leader. This was the first time that the ulema were used as a real political deciding force, so with the consent of the ulema, King Abdul Aziz crushed the uprising of the Ikwan.[11]

The King and his new country were nearly bankrupt and had no reasonable solution or means to change the situation. In July 1933, geologists from the United States landed in the port of Jubail off the Persian Gulf on the Eastern coast of Saudi Arabia. A few days later, they found the largest oil field in the history of this planet; the Ghawar oil field. Measuring 174 by 131 miles,[12] the massive oil field sits on a basement fault block dating back to the Carboniferous time, or about 320 million years ago. Cretaceous tectonic activity enhanced the structure and the reservoir limestone rocks that hold the petroleum date back to the Jurassic time. After the discovery, King Abdul Aziz granted the Standard Oil Company of California a 60-year concession to explore, research, drill, extract, manufacture, and transport petroleum and kindred bituminous matter. The forthcoming agreement between Standard Oil Company and King Abdul Aziz became known as the Arabian American Oil Company (Aramco). The conglomeration yielded the Saudi Arabian government the guarantee that they would be provided with steady income, and in return, Aramco was given exclusive rights to all oil underneath the Eastern desert. In 1938, geologists for Aramco found oil in commercial quantities at the Dammam Dome near Dhahran. The next year, Aramco exported its first tanker load of petroleum.[13] This dealing was considered the first of many forays by the United States

into Saudi Arabia and the beginning of their long and tumultuous relationship that is still in effect today.[14]

After the agreement was signed and the first barrel was exported, the influx of government income was astonishing. Immediately, the Al Saud family's position was fortified, and a consolidation of political control became a necessity. The Kingdom of Saudi Arabia was in need of a central leadership figure and King Abdul Aziz took on the role, becoming the supreme leader of all groups, tribes, societies, and cities within the Kingdom, again with the help of the religious elite and his Ikwan soldiers.[15]

In 1939, a year after geologists discovered oil in Saudi Arabia, the government revenues amounted to US$7.17 million per year. Of that number, only US$340,000 was from oil, US$2.23 million from Hajj collections, the rest coming from customs and local sources of income. Oil revenue went directly to the recently established public treasury, but the money was treated as the personal bank account of King Abdul Aziz, with no distinction between his private assets and the public treasury. The lack of distinction between personal and public money has continued to this day and has caused problems for the Royal Family. By 1946, government income from oil equaled US$10 million. Five years later in 1951, the amount rose to US$110 million. The next year in 1952, income doubled and the House of Saud was bringing in US$212 million worth of oil revenue. Nine years later in 1961, the amount doubled again to equal US$400 million. Seven years after that in 1968, government income stood at US$926 million. In 1970, a new threshold was reached and the country was earning US$1.2 billion. The first true oil boom hit in 1973 and after another 4 years the country was selling US$22.5 billion worth of oil, a free natural resource requiring little manpower.[16]

The 1950s ushered in another tumultuous era for the Kingdom of Saudi Arabia. Social change was occurring rapidly, and for many, it marked a new way of life. Infrastructure programs were underway, and one of the first public service actions the Royal Family took was to establish a land distribution program. The program gave each Saudi national their own plot of land and a small loan in order to build their own house. The social system was still based on the tribal and kinship model, but the rural Bedouins began moving into more urban areas because of the free land allotments, concentrating the population into the economic centers of the country.[17]

Tribal chiefs had begun to receive direct cash payments from the Al Saud family from oil revenues, no longer needing the generosity or alliance of the merchant class. With a sudden role reversal, the tribal leaders were now independent, which essentially robbed the merchant class of the social and political privileges it held over the tribal leaders. Even worse, the gap between oil income and income from other resources such as the camel and pearling trades became too great, and income from those other resources was no longer needed. The long-standing traditions of nomadic and pastoral resource cultivation became irrelevant with the discovery of oil.[18]

The 1950s was a turning point in the development of the Saudi Arabian economic market as well as in the political atmosphere. The founder of the Kingdom of Saudi Arabia, King Abdul Aziz, died in 1953, which required the appointment of his first successor. King Abdul Aziz had appointed his son Saud as his Crown Prince, so when King Abdul Aziz died, King Saud was ready and willing to replace his father. A rift occurred in the family over King Saud's governing style, however. He turned out to be an inconsequential leader who merely wanted to spend the family's money and vacation

in Morocco and Europe. He was not as interested or as knowledgeable as the family would have liked him to have been on the political and economic matters of the state. In 1964, the brothers of King Saud consulted the ulema who then issued a *fatwa,* a legal pronouncement issued by religious law specialists, for the abdication of King Saud with King Faisal as the replacement. King Saud was then exiled to Athens, Greece, where he died soon after.[19]

The start of economic development in Saudi Arabia really began with two major national projects, Tapline, the worlds largest oil pipeline which ran from Saudi Arabia to Lebanon with a capacity of up to 500,000 barrels per day, and the new railway line that connected the port city of Dammam and Riyadh. Although these were large investments into the national oil and transportation sectors, King Saud built little in the way of social infrastructure. Only a few hospitals, schools, and roads were built under his reign. He did spend lavishly on himself, building several massive palaces, and generously handing out large monetary gifts to the tribal leaders to maintain their support. He managed to fund these personal activities while leaving the Kingdom's financial coffers virtually empty. By 1958, the Kingdom of Saudi Arabia had accumulated a foreign debt of US$310 million, bankrupting the nation yet again.[20]

By 1954, only five industrial establishments had been pursued. The first productive enterprise created was the quarrying and processing of marble, due to the entrepreneurial initiative of Mohammad bin Laden and his brother, who were originally from Yemen. Little other industrial or manufacturing companies besides a new cement company emerged outside of the bin Laden control until the reign of King Faisal in 1964. There has been considerable change over history as to how influential the ulema have

been, and much of that is dependent upon who the ruling king is. In 1964, when King Saud was ruled to be an incompetent leader by the other members of the family, the religious establishment provided the Islamic religious justification for deposing him and replacing him with his brother Faisal. The reign of King Faisal from1964-1975 was the golden era of development for Saudi Arabia. King Faisal actively pursued market reform, the modernization of the budget, and fiscal control. Modern infrastructure including health services, education, television, telecommunications, primary education for girls, the abolition of slavery, social security laws, and the implementation of a ten-point private economic system, were also introduced during his reign.[21]

The 1960s marked the beginning of Royal Family entrepreneurship. A small number of royal princes took advantage of King Faisal's decision to allow princes to go into private business on a large scale. During this time, several Royal-owned companies were started, including Saudi Plastics Products, Saudi Transport and Ports Services Co., Saudi Research and Development Co., Kingdom Establishment for Trading and Contracting, Consolidated Contractors, National Automobile Agencies Co., and Saudi South Eastern Drilling Co. The princes took their companies seriously, incorporating the talent and knowledge of some of the local merchant families but also using their international connections to partner with foreign companies.[22]

Until the 1970s, oil prices and revenues experienced a constant low rate of increase. It was not until King Faisal, together with the other Arab oil exporting countries, initiated new policies, prices, and quotas within the structure of Organization of the Petroleum Exporting Countries (OPEC) that the oil revenues exploded to an unprecedented level. The time between 1973 and 1980 was considered a boom period for

Saudi Arabia, with oil prices rising from US$2 per barrel to US$42 per barrel. With this immense increase in government revenue, King Faisal was able to begin implementing his Second Five Year Development Plan, which included an investment into the country of US$142 billion. The Plan called for building physical infrastructure, encouraging the private sector to increase productivity, promotion of the private sector to participate in the development process, and it gave priority to the expansion of agriculture and industrial projects in order to diversify the economy. Two industrial cities were established in Yanbu and Jubail in an effort to develop a hydrocarbon-based industry with foreign technology and capital. In order to meet the demands of the Development Plan, specialized banks were established to include funding for agriculture, industrial efforts, and real estate.[23]

King Faisal was a very popular king among the Saudi Arabian population for all of his efforts at modernization and relaxing the strict religious laws regarding women and basic freedoms. He turned out to be very unpopular with the ulema because in their view, modernization meant Westernization, which they believed to be a threat to Islam. King Faisal became aware of their dissatisfaction with him and in order to appease them, he allowed for extremist religious scholars to enter the country to live and teach their extremists Islamic beliefs.[24]

With the rapid change that Saudi Arabia was experiencing in its social and political realms came dissent. The first major incident involving dissent among the ulema and the Royal Family occurred in 1973 when the ulema pressured King Faisal to use oil as a weapon to punish the United States for their tacit agreement in allowing Israel to continue developing lands that Arabs believed to be theirs. King Faisal was cautious

to use oil as a weapon against the United States, thinking that an embargo would hurt Saudi interests. In order to satisfy the growing frustration of the ulema, King Faisal implemented the embargo in October 1973. The embargo accomplished the goals of the ulema: to increase the stature of Saudi Arabia as the leader of the Muslim world while also distancing it from the West. The religious establishment were often at odds with King Faisal and his penchant for modernization, to which the ulema are strictly oppose.[25]

In 1965, King Faisal had allowed televisions into the country for the first time. King Faisal's nephew Khalid objected vehemently to allowing television in the country and he staged a public demonstration, which is illegal in Saudi Arabia. King Faisal gave the order to the National Guard to use force to quell the opposition and one of the soldiers killed Khalid because he had fired at them. Ten years later in 1975, Khalid's brother, King Faisal's nephew, assassinated him in retribution for giving the order to kill Khalid.[26]

In 1975, King Faisal's brother Khalid became king. King Khalid was not interested in politics, but he was interested in building and modernizing the country. At the time, the population of Saudi Arabia was four million people. Due to the rapid rate of building infrastructure, King Khalid began to import foreign labor in order to keep the progress moving. The beginning of grand scale Royal Family corruption began during this time, as well. Bribes and commissions were paid, real estate fraud was committed, and illegal land sales occurred. Only Royal princes can register land in the desert, which they did, and then sold it back to the government and to private companies and citizens at an exorbitant rate. The House of Saud realized the extent to which they could earn money, either through legitimate or corrupt practices, and began going on lavish vacations in Europe and spending money on magnificent palaces within the country. The

Royal Family began to lose their legitimacy with the population, as well as with the religious establishment. With development occurring at an even more rapid pace than it did under King Faisal, the ulema discussed publicly their dislike for King Khalid.[27]

Public discontent came to a head in November 1979. A man by the name of Juhaiman ibn Muhammad ibn Saif al Otaibi had been from a tribal area in Arabia that King Adbul Aziz had conquered. Al Otaibi was a university student in Medina in the 1970s and had become convinced of the illegitimacy of the Al Saud family due to the family's decadence and prolific spending and indulgency. Al Otaibi and others in the Saudi Arabian population had believed that the Royal Family was becoming too Western and that they were no longer responsible Islamic leaders. Al Otaibi had been a member of the National Guard before entering the university and once in school, began organizing a small militia modeled after the original Ikwan. In November 1979 during the annual Hajj, al Otaibi and his soldiers seized control of the Grand Mosque and held control of it for two weeks.[28] The ulema issued a fatwa allowing the government to use force against the rebels, but the Saudi Arabian National Guard was unsuccessful at stopping them. Hundreds of pilgrims were killed and some even joined the rebel forces. French and Pakistani forces were brought in to help stop the rebels but the reputation of the House of Saud and the bureaucracy was tarnished in the eyes of the Saudi population. Perceived economic corruption from oil revenues, an inability to secure the Grand Mosque, and the view of being religiously and politically illegitimate caused a rift between the three sectors of the country: the religious elite, the Royal Family, and the population.[29]

In response to the religious and public discontent, the House of Saud made a move to return the country back to the state of traditional Wahhabi Islam. The Royal

Family invested millions into religious education for the nationals. With the consensus of the ulema, the government also sent soldiers to fight with the *mujahidin*, Islamic fighters on behalf of jihad, in Afghanistan to battle the Soviet Union against communism. This decision resulted in the training of 20,000 young Saudi men, who quickly learned valuable military skills. For the 10 years that they fought the Soviet Union, they gained the confidence of fighting a super power, fighting for Islam, and learning fighting methods, which today would be considered terrorism.[30]

In 1982, King Fahd came to power and immediately befriended Saddam Hussein, the leader of Iraq. King Fahd also began his reign by establishing industrial estates in Riyadh, Jeddah, and Damman, with the purpose of producing agricultural products, and in 1988, The Saudi Arabia Oil Company (Saudi ARAMCO) was finally fully nationalized.[31]

Throughout the 1980s, an oil glut occurred throughout oil developing countries, dramatically receding oil revenues in the Kingdom. The Organization of the Petroleum Exporting Countries (OPEC) newly installed quota system fell largely on the shoulders of Saudi Arabia. The Kingdom no longer wanted to be the swing producer of the producing nations, so they flooded the market with a glut of oil, which decreased oil revenues for other oil producing nations. By that time, Saudi Arabia had already committed to huge investment expenditures and the government was forced to draw down on their foreign assets to pay for the expenditures. The global oil price crash in 1986, caused by Saudi Arabia's violation of OPEC quotas in their attempt to regain market share and impose production discipline among other OPEC members, did nothing to help the economic stability of the nation. Oil revenues during the last few years of the decade remained 25-

30 percent lower than during the first few years of the decade. The quick sale of government bonds stopped the monetary hemorrhaging and facilitated domestic confidence again.[32]

All efforts at restoring confidence in the economy and in the government completely evaporated after the Iraqi invasion of Kuwait. Saddam Hussein's troops were amassing along the Saudi Arabian border, representing an imminent threat to the Kingdom. King Fahd sought consensus from the ulema to allow him to invite troops from the United States, Great Britain, France, and other foreign countries into Saudi Arabia. In order to gain consensus, King Fahd made the extreme concession to offer the assurance that all non-Muslim troops would respect the traditions of the Kingdom and that once no longer needed, the troops would leave immediately. The United States government did not understand at the time how the continued presence of American forces would create long-term hostility towards the United States. Following the Kuwait war, the religious establishment publicly resisted the continued presence of American troops on Saudi Arabian soil and soon elements of extremism emerged, leading to an upsurge in anti-Western rhetoric.[33]

Confidence in the economic situation was also waning. Saudi Arabia was once again forced to be the swing producer to make up for barrels lost in the war due to the destruction and fires at many of the oil wells in Kuwait. This caused domestic investment into social services and infrastructure to come to a standstill due to the significant decrease in revenues. However, following the end of the Gulf War in 1991, Saudi Arabia's standing in the oil world improved. Saudi Arabia was the only major oil producing country that had significant excess capacity of crude oil production to make up

for the losses incurred during the war. An increase in oil revenues did not correspond to an increase in infrastructure or a solid plan at economic diversification.[34] It was not until 1995 that oil prices started to stabilize and the government felt confident enough to start reinvesting in the country. Despite the internal political turmoil with the accession of a new leader, Crown Prince Abdullah following the stroke of King Fahd in 1995, the rest of the decade and into the early 2000s was considered an economic stabilization period for the country.[35]

The Seventh Development Plan began in the year 2000 and was completed at the end of 2004. The priorities of the Plan included expanding human resource development, which entailed raising the productivity level of the country by implementing relevant training programs to the under- and unemployed. An effort at privatization was enacted to increase the participation of Saudi nationals as well as allowing international investment and foreign capital. One important goal was to raise the efficiency of the government and to improve public services through the development of institutional and financial regulations.[36]

By 2002, the Seventh Development Plan was meeting its goals within the country and Saudi Arabia was back to making money via its international oil exports. Overall, there was an increase in economic growth, higher per capita income, an increase in private sector participation, and higher trade surplus.[37] Oil revenues had begun to increase dramatically as well, producing large budgetary surpluses. Manufacturing, agriculture, and the banking sector grew dramatically in the early 2000s. Between 2000-2004, the focus of government spending was on economic diversification, and creating a greater role of the private sector in the economy. The government aimed at achieving a

3.4 percent growth rate of GDP per year with the addition of 817,300 new jobs for Saudi nationals. Between 2005- 2010, economic diversification was again a government priority, as well as integrating women into the educational system. New universities and colleges with technical specializations were built, and the Hajj tourism industry became an even greater addition to economic diversification due to recent investment into the Grand Mosque and neighboring areas.[38]

The Eighth Development Plan began in 2005 and ended in 2009. The objectives of that plan were to safeguard Islamic teaching and values, enhance national unity, improve the services provided for Hajj pilgrims, to diversify the economic base with an emphasis on manufacturing industries, and to improve the productivity of the national economy.[39] As of 2010, the government claimed it wanted to eliminate poverty and increase development and infrastructure, medical services, educational capacity, and residential housing through its Ninth Development Plan. The new economic plan called for an increase in real GDP by 15 percent over five years, requiring significant governmental investment in human resource development.[40]

This chapter discussed the economic, social, and political beginnings of the Kingdom of Saudi Arabia. The country that began as a Bedouin and merchant class society evolved into the most important producer of energy in the history of the world. The income that has come from the precious resource of oil has provided the King the ability to provide subsidized benefits in areas such as housing, healthcare, education, and energy. This chapter examined the history of the religious establishment, the succession of Kings, and the economic developments that have occurred in Saudi Arabia since before the Kingdom of Saudi Arabia was even a state. The remainder of this paper will

draw on these historical developments to analyze the actions that the House of Saud has been taking in order to prepare for the death of rentierism, as well as the obstacles that are preventing them from proper preparation.

Notes

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[18] Sabri*, House of Saud*, 8.

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THE SOCIAL LANDSCAPE IN SAUDI ARABIA

Rentierism in Saudi Arabia

A new form of social and economic engineering in Saudi Arabia came after the discovery of oil in the form of *rents*. The term *rent* refers to the monetary income derived from the sale of a natural resource to an international buyer. A *rentier* is a state that derives at least 40 percent of their national income from the cultivation and international sale of their homegrown natural resource. However, a rent is not merely income for landlords, governments, and royal families. It is considered a reward for the ownership of natural resources, and in Islamic countries especially, it is considered a gift from God.[1]

Saudi Arabia, as well as Kuwait, Bahrain, the United Arab Emirates, Qatar, and other oil-dependent Middle East countries are considered to be *rentier economies.* Rentier economies refer to the all-encompassing economic character of a nation which earns the majority of their income from the sale of their natural resource to buyers outside of their own country.[2] The state is essentially supported monetarily by the sale of this resource, as all other forms of income fall short of being the income behemoth that the natural resource provides. When the secondary and tertiary economies dwindle after the discovery, extraction, and exportation of natural resources, the society becomes even more dependent on the government. The economy outside of the petroleum industry becomes unviable, often resulting in a financially poor population with limited

employment opportunities, few marketable or useful skills, and the mentality that the state should take care of them from cradle to grave.[3]

While income from the natural resource is the main source of income, pure rentier economies do not exist. Saudi Arabia comes statistically close to a pure rentier economy with 80 percent of budget revenues, 45 percent of GDP, and 90 percent of export earnings coming from the international sale of oil.[4] Even with the high income that oil provides, Saudi Arabia does have income from other sources such as zakat collection, Hajj tariffs, and international investment.[5]

An important feature of a rentier economy is that the creation of wealth is centered around a small fraction of the society. In Saudi Arabia, only 1.5 percent of the population is involved in oil production, while the rest consume it and reap the rentier rewards from it. The resource, usually oil, is typically subsidized for the citizens of the country from which it originates and the cost of manufacturing is low compared to the massive amount of income that is generated from it.[6]

In a rentier state, the government is the sole original recipient of the external rent. The job of the rentier state is to then distribute the rents according to the needs of the population.[7] Throughout the Middle East, rent distribution is handled differently amongst the rentier states. In Saudi Arabia, rents are distributed on a subsidy basis. Social services, healthcare, roads, education, energy, and other features of a modern society are paid for by the government. Kuwait, on the other hand, has such a small population that the government pays for all of the same social services that Saudi Arabia pays for, as well as giving direct cash installments to each citizen of the country. Each Kuwaiti citizen receives US$600 per month in direct cash transfers. Each married couple receives

US$1,000 per month, and parents receive US$500 per child, per month, for up to 12 children.[8] Saudi Arabia was initially a low-density rentier state with a small population, allowing for each national to claim the majority of benefits offered. Over the years with the population increasing, Saudi Arabia has evolved into a high-density rentier state and individual direct cash transfers are no longer feasible, like they are in Kuwait.[9]

In a rentier economy, the power that the government accumulates and is charged with after the discovery of a natural resource is staggering. The livelihoods of every citizen and each person residing in their country are dependent on them to distribute the income fairly and legitimately. If the government does not already have a substantial amount of power when the natural resource is discovered, then a royal family, the political elite, or a government structure must quickly take on the political power role without major political, social, and economic disruption.[10] The Kingdom of Saudi Arabia was created only six years prior to the discovery of oil. The newfound income and responsibility associated with international trade forced the Al Saud family into an even more powerful position. They became the legitimate ruling authority of Saudi Arabia after the discovery of oil because they were charged with providing even the most basic of necessities to its population.[11]

Saudi Arabia currently has a *rentier mentality.* A rentier mentality arises from the luck, or chance, of a citizenry base that is no longer expected to be active members of the society and becomes reliant upon government subsidies generated from rents.[12] As a Saudi Arabian national under the power of a King, having all basic needs provided for by the government, and not being expected to contribute to the manufacturing or distribution of oil has created a rentier mentality. The income of the state is not based on the

economic prowess or hard work of the citizens of the country. They are not expected to work or risk their own financial allotment to become entrepreneurs in order to provide for their families, or for the government. Everything that they need to survive is handed to them. There is a break in the work-reward dynamic. The reward for being in the right place at the right time in history becomes a windfall gain and not the result of systematic hard work. The reward is situational, vulnerable, and opportunistic.

Rentier mentality has been prevalent since the discovery of oil in 1938, and has permeated the mindset and culture of the Saudi Arabian population. This mentality has resulted in a limited and unmotivated workforce. The minimal skill structure and lack of desire and need to work have forced an outside workforce to infiltrate even the most basic of service jobs in order to provide for the Saudi Arabians. Services and activities are manned by an expatriate workforce who do not have the same rights as Saudi Arabian nationals, yet they are the backbone of society.[13] With this new allocative system and rentier state mentality, the government moves farther and farther away from its people instead of growing closer to them. The government becomes isolated from the population and therefore becomes unresponsive to the demands of society. The capacity of the state to react to citizen demands often declines and sometimes disappears when they are not expected to use it on a regular basis. Nationals do not pay taxes and therefore do not expect anything but social and economic allocations from its government. The government simply 'pays off' its citizens and in return, does not need to provide democracy, and is not accountable to its citizens other than to provide rents. The population then becomes a cost and a burden to the government. [14] Since the citizens make minimal contributions to the state, mainly in the form of the zakat, or religious tithe

amounting to 2.5 percent of a Muslim's total wealth, they then have little interest in controlling the elite of the state, including the Royal Family.[15]

The phenomenon of rentier mentality is not unique to Saudi Arabia. Other Gulf States in the Middle East also have a rentier mentality and import the majority of their workforce. More than half the entire population of Kuwait are expatriate workers who are there to do the jobs that the Kuwaiti's do not want, or have, to do.[16] Thomas Stauffer elaborates on the term *rentier* to go beyond simply the economic aspect of it, and posits it as a social function as well. He opines that the citizenry of the rentier state consider themselves to be members of a special and elite group of people. These people do not have to engage in the hard labor of extracting, manufacturing, and distributing the natural resources that make them so wealthy. They can and do pay expatriate workers to do these types of jobs for them.[17] Rent wealth becomes the right of citizenship, and not just a convenience or a perk. In states that have high levels of rent income-to-population ratios, such as Kuwait, they have little in the way of securing reliable employment for their locals. The jobs in most rentier economies are usually a means of creating a living without any real productive effort. It is usually not self-sustaining, and is usually a façade for production.[18]

Similarly, most economies in the Middle East are characterized by differing degrees of dependence on nonrenewable resources. Oil, phosphates, natural gas, unrequited transfers of foreign aid in the form of grants or concessions, quasi rents such as income remittances from foreign workers, or locational rents, such as pipelines and canals, all contribute to rentier economies.[19] The structure of the economies are determined not by the domestic factors of production, but by the process of adapting to,

and incorporating, the economic rents and the external flow of resources into the folds of the state budget.[20]

The value of the natural resource is the difference between the market value of the resource and the cost of production, known as the economic rent. However, the oil export prices are completely divorced from the actual cost of local production. The export prices are not based on a valuation of the finished product, minus the labor and manufacturing costs, because the natural resource, in this case oil, is free.[21] The price of a barrel of oil set for export is based more on regional and global production quotas, the international political atmosphere, and the rise and fall of global demand and consumption. It costs Saudi Arabia approximately US$6 to manufacture one barrel of oil. Historically, on the international market, a barrel has reached prices in excess of $120 per barrel, yet it often fluctuates. Because oil has been the most profitable natural resource this planet has provided, and the ramifications of it have occurred in less than the last 100 years, there is no established precedent for adjusting national incomes for the depletion of a nonrenewable resource.[22]

In the case of Saudi Arabia, the likelihood that the state will be able to continue to be rentier is unlikely. There are three phases of rentierism and Saudi Arabia has passed through the first two phases of rentierism and is in their final phase. The first phase is called *Classical Rentierism,* where the state earns a large amount of money from external rents, and it is highly allocative with high social spending and little to no taxation applied to nationals. The state at this phase is autonomous from society, and has little or no economic or development policies in place. The government is typically wasteful, if not corrupt at this stage, and elite political relations are managed through

neopatrimonialism.[23] Saudi Arabia could have been considered to be in the *Classical Rentierism* phase from 1938, when oil was discovered during the reign of King Abdul Aziz, until 1964, when King Faisal took command.

The second phase of rentierism is called *Specialized and Conditional Rentierism.* During this phase, the state is allocative, but begins to apply some taxation. The state begins to implement some sort of economic policies and reforms, the state's role varying across the macro and micro levels. Saudi Arabia lingered in this phase throughout the reign of King Faisal, from 1964 until 2005 when King Abdullah began his leadership.

The third phase of rentierism is called *Late Rentierism.* Late Rentierism occurs when the state is responsive, globalized, and strategic in its thinking. Late Rentierism evolves from the forces of state maturity, experience with the ramifications of oil, and the need for the state to develop and diversify its economy for the preparation of an economy without oil.[44] Saudi Arabia slowly entered into this last phase after King Abdullah succeeded the throne in 2005, is still in this phase as of the year 2012, and will continue to be until rentierism is obsolete.[24]

The remaining section in this chapter will discuss the current social and political landscapes present in Saudi Arabia, all of which are a result of rentierism. The remaining chapters of this paper will discuss how and why Saudi Arabia will have to quickly adopt a new national economic policy, alternatives to government income besides oil, and the education and motivation of a rentier mentality society in order to maintain their current way of life. Once the government is unable to maintain their rentierism, it is certain that their citizens will not continue to maintain their current way of life. It is probable that if they do not make changes, their society will revert back to the pre-oil days of nomadic

pastoralism, pearling, and the reliance on Hajj income in order to survive in a nonrentier state.

The Social Landscape in the Kingdom of Saudi Arabia

Saudi Arabia is the 13th largest country in terms of landmass and the 46th largest according to population in the world. At the beginning of 2012, the population of Saudi Arabia hovered around 27 million people; of that, 21.4 million people are Saudi Arabian nationals, with an additional 5.6 million nonnationals and expatriate workers. The population in Saudi Arabia is very young, with 70 percent being under the age of 30, 43 percent being under the age of 14, and only 2.5 percent over the age of 65.[25] The domestic population growth rate is 2.18 percent and the birthrate is 19.34 births per 1,000 people, one of the highest in the world. The death rate is only 3.33 deaths per 1,000 people and the infant mortality rate is very low at only 13.7 deaths per 1,000 live births. There is a high overall life expectancy of 75.67 years. The fertility rate has fluctuated between 4.1 and 6.4 births per woman since 1985. High fertility rates, low death rates, high life expectancies, and an increasing expatriate workforce puts Saudi Arabia into the classification of suffering from a 'population bomb.'[26] In order to put these numbers in perspective, the United States has a population of 313.8 million people, of which 20 percent are between the ages of 1-14, 66 percent between 15-64, and 13 percent over the age of 65. The population growth rate is .889 and the birth rate is 13.68 births per 1,000 people. The death rate is high at 8.39 deaths per 1,000 people with a life expectancy of 78.49 years. The population of the United States is nearly 12 times larger than the population of Saudi Arabia and it has nearly one-third the population growth rate. These

numbers are indicative of a population that is forced to work for its income. Women make up nearly half of the United States workforce and the more women that work, the lower the birthrate will be.[27]

Historically, the Kingdom encouraged the social policy of having as many children as a woman could, in order to grow the empire. This policy proved to be a burden on the government once the House of Saud took on the role of being rentier and chose to provide and subsidize all forms of social and economic benefits. Birth control in Saudi Arabia is easily accessible from local pharmacies and is available over-the-counter.[28] The Islamic ruling on contraception, however, is that permanent contraception such as vasectomies and tubal ligation are not allowed because according to Islamic scholars, it changes the human physiology. The Prophet Mohammad is reported to have said, " Marry the one who is loving and fertile, for I will be proud of your great numbers before the nations" *(Abu Dawood Hadith No. 2050).* On a similar note, abortion is not acceptable according to Islam. "Kill not your children for fear of want: we shall provide sustenance for them as well as you: verily the killing of them is a great sin" *(Al-Quran 17:31).*[29] The withdrawal method is also not an acceptable form of birth control because according to Islam, it interrupts a woman's pleasure and prevents a woman from conceiving if that is what she chooses, but the withdrawal method is acceptable if the woman explicitly agrees to it. Overall, Islam permits the use of birth control for four main reasons. The first is to let the woman rest between pregnancies and the second is to prevent the transmission of sexual transmitted diseases. The third reason is if it is required for the health of the woman and the fourth is if the husband cannot financially support more children.[30] The religion of Islam is, and continues to be, strongly pro-

family and regards children as a gift from God. Wahhabi Islamic scholars are reluctant to promote the use of contraceptives for the fear of reprisal from the more conservative religious scholars.[31] While the country is in a good social position to begin educating the public on the use and benefits of birth control, changing the long-standing historical culture of having many children will be one of the greatest challenges facing the Kingdom of Saudi Arabia. The country will, however, be forced to tackle this issue head on in order to maintain their rentierism for as long as possible. The burden of constant and sharp population growth will not only be a drain on the oil supply but on all forms of alternative resources as well as all social benefits for a country that will be cash strapped, resource barren, and educationally marginalized.

Until the 1960s, most of the population in Saudi Arabia was nomadic but due to oil rents and land distribution programs, more than 95 percent of the country's population is now settled in urban areas. The overall density of Saudi Arabia is 33 people per square mile. In urban areas, the density increases to 2,600 people per square mile due to the uninhabitable desert climate pervading the majority of the country's land mass.[32] The area around the holy sites of Mecca, which includes the cities of Jeddah and Medina, is the most populated region of the country and is home to 26 percent of the total population. The second most populated area is the Eastern Province, which includes the cities of Riyadh, Ad Dammam, Khobar, and Dhahran, which house the people who work in the oil fields. The least populated regions lie at the extreme north and extreme south of Saudi Arabia.[33]

The social, cultural, and religious makeup of Saudi Arabia is incredibly homogenous. More than 90 percent of the native population is Arab and the remainder is

of African and Asian descent. Arabic is the official language of the Kingdom. Islam is the official religion of Saudi Arabia and the country's legal code and education system follow Islamic, Sharia law. All Saudi nationals adhere to the Islamic religion with 85 percent following the Sunni sect, the majority of which are Wahhabi. About 2 million Shia live in Saudi Arabia, most of which live in the Eastern Province. Religions other than Islam are only found among expatriate workers and foreign nationals and they mainly adhere to the Hindu and Christian faiths. Public worship of religion other than Wahhabi Islam is prohibited by law and is regulated and punished by the states' *mutawa,* Committee for the Propagation of Virtue and the Prevention of Vice, or religious police. The Saudi Arabian government has now begun to allow non-Muslim foreigners to practice their religion privately, but there has been no change in the actual law to allow for it, still making it a national crime and thus punishable by the government.

The government controls all mosques and is the employer of all *imams,* or Islamic leaders. The government also controls the centers that facilitate the conversion of foreigners to Islam as well as all government employment appointments. Non-Sunni Muslims are eliminated from consideration for government employment, as well as any other non-Sunni. Conversion from Wahhabi Islam and proselytizing by non-Muslims and even non-Sunni Muslims are crimes punishable by death by the Saudi Arabian government.[34]

A separate reason for the population explosion has been the historically lenient laws regarding nonnational and expatriate relocation into the country of Saudi Arabia. While nonnationals and expatriates are not entitled to receive the same amount of government benefits that Saudi nationals receive, they still benefit from the energy and

petroleum subsidization programs, infrastructure, and they still have access to advanced healthcare and education if they choose to participate and to pay for them. Although living with few rights, nonnationals and expatriates are still a drain on the economy and will still contribute to the waning rentierism Saudi Arabia will experience when domestic oil production equals domestic consumption. In May 2011, the Saudi Arabian government issued a directive that it will not renew any work permits for foreign individuals who have already spent six years in the country. This was an effort on behalf of the country to create more jobs for nationals as well as to decrease the foreign population in Saudi Arabia. This directive was part of a ten-point program in an effort at *Saudization.* Saudization refers to the efforts in a variety of sectors in the country to improve the standard of living for Saudi nationals. The program touches on efforts to decrease unemployment, increase individual income, increase national income, income diversification techniques, investment strategies, educational reform, as well as an improvement in international relations.[35]

Education

The literacy rate for Saudi Arabian males is 84.7 and 77.8 for females. The region surrounding Riyadh has the highest literacy rate of about 90 percent. The lowest literacy rate is in Jizan, which is located in the southwest corner of Saudi Arabia, where only about 75 percent of the population is literate. The government spends 5.6 percent of the Gross Domestic Product (GDP) on education and has built 20,000 public schools and eight public universities. Public education is free to every Saudi national but parents are not required by law to send their children to school. Approximately 50 percent of

children enroll in primary education, and intermediate and secondary schools. Although education opportunities for girls and women have increased, classroom instruction and entire schools are still segregated. Women are only allowed to attend six of the eight universities and they are prohibited from studying certain subjects, such as science and technology related to the oil industry. All curricula must conform to Islamic laws and the teaching is strictly based on the Quran.[36] The vast majority of government spending on education goes towards the thousands of *madrasas,* or Islamic religious schools, Islamic academies, al-Qaida training camps, and mosques in the United States and in Europe. Half of the PhDs awarded in the Kingdom of Saudi Arabia are in Islamic studies. Young men without education end up unemployed and shunned by the state and by the private sector. Many turn to the Islamic clerics for guidance and for something to occupy their time, as well as for employment.[37]

Education in Saudi Arabia is under the jurisdiction of the Ministry of Education, the Ministry of Higher Education, and the General Organization for Technical Education and Training. In 2003, the Ministry of Education developed the "Ministry of Education Ten Year Plan 2004-2014," which set goals for the education system to be completed during that timeframe. Of the sixteen goals, seven of them were general goals regarding the increase in accountability of the educational infrastructure to provide transparency. Three of the goals were directed at increasing the capacity of students at the educational centers to accommodate students ages 4-18 years of age. One goal was to eradicate illiteracy, another was to organize technical education for girls, and the remainder of the goals were centered around expanding the role of Islam and national pride.[38]

In Saudi Arabia, there are six private schools, which are geared mainly towards Western students who are living in Saudi Arabia with their parents who work for Saudi Aramco or other Western-based companies. There is one Institute for Public Administration and four technical and vocational schools. These schools specialize in educating students for certain careers such as for being sales agents, receptionists, jewelry salesmen, air conditioning sales and repairmen, auto mechanics, customs forwarders, Linux web developers, and as truck drivers.[39] Women are not allowed to enroll in the majority of these courses because the ulema and government ban them from working in most of these fields.[40]

There are eight public universities in the country, only two of which women may attend. In order to attend university and receive free tuition, the student must be a Saudi Arabian national. Education is limited to courses in manufacturing, chemical processes, chemistry, biochemistry, and chemicals as well as Islamic courses on the Sharia and Quran. There are few courses offered in business management, entrepreneurship, economics, international relations, mathematics, English, or linguistics. The majority of the courses at the university level and in the vocational schools prepare the students for menial labor jobs and employment in natural gas, oil, and the mining industries in the Kingdom.[41]

The study of Wahhabi Islam continues to completely dominate the Saudi Arabian education system. Starting in Kindergarten through higher education, rote memorization of large parts of the Quran is required and learning the application of Islam in daily life is the main course of study. Students are required to enroll in Islamic education courses along with other courses in their chosen field of study.[42] Wahhabi Islam education in

Saudi Arabia has been known to focus on the Wahhabi ideology of hatred toward the unbeliever and anyone who does not follow the Wahhabi doctrine of Islam, even if they still consider themselves Muslims. To tackle this problem and to encourage educators and students alike to focus on education that will benefit the student as well as the population, a comprehensive development program has been established. This development program is called *Tatweer,* and was established in 2007. The goals of the program are to develop a system of educational standards and to develop a curriculum to meet current and future skill needs. The reforms have been budgeted at US$2 billion with the underlying goal of moving public education away from Wahhabi extremism and to encourage students to pursue more secular and vocationally based education.[43]

Health and Welfare

Some Saudi Arabian nationals enjoy a lavish lifestyle that creates and promotes a lack of motivation. Coupled with cultural and social restrictions, the lack of motivation has resulted in a 35 percent obesity rate. Saudi Arabia ranks 5th in the world for obesity, only behind The United States, The United Kingdom, Australia, and Malaysia.[44] Each Saudi national does, however, have access to unlimited, free healthcare. The government spends 13 percent of the annual GDP on health care expenditures such as building and operating new hospitals and nonurgent care centers. Part of the expenditure also goes to recruiting nonnational expatriate doctors to work in the country. Saudi Arabia's health care system is two tiered, consisting of established hospitals in the urban centers and mobile units to visit the rural areas of the country. The mobile units provide minor and preventative healthcare, leaving major surgeries and more extensive healthcare issues for

the doctors in the large cities to tackle. Although there are 1.5 doctors and 2.3 hospital beds per 1,000 people in Saudi Arabia and the rate of specialized service providers has been increasing, the policy of sending patients to the United States for more complicated procedures continues. In an attempt to keep patients in their home country, the Saudi Arabian government has invested in, and turned their attention to, improving Saudi facilities and local expertise. With large amounts of investment, however, only about 20 percent of the doctors in the country are Saudi nationals, the rest being expatriate physicians.

Although Saudi Arabia does not release national statistics on health and welfare, the United Nations has estimated that the country has all but eradicated HIV/AIDS, diphtheria, poliomyelitis, whooping cough, and measles due to the near 100 percent immunization of babies. Almost the entire population of Saudi Arabia has access to clean water and sanitation as well as access to affordable essential drugs. Trained physicians attend to almost all live births, resulting in the low infant mortality rate. Although many technological and infrastructural advances have been made in the medical field in Saudi Arabia since the 1970s, problems with management have hindered coordination among the various state and private health care providers.[45]

An issue that has plagued the reputation of Saudi Arabia is that of domestic violence among women and children. In 2003, a report by the Saudi Ministry of Interior estimated that 21 percent of women suffer abuse. A study done in health centers in Medina in 2009 verified that statistic by asking women who came in for treatment about mental, physical, and emotional abuse. Women were interviewed using questions from the Modern Conflict Tactic Scale, Kansas Marital Scale, and the lie scale of the

Minnesota Multiphase Personality Inventory. Of the 689 women interviewed, 25.7 percent reported physical abuse and 32.8 percent reported emotional abuse without physical violence. The lifetime prevalence of abuse among those women was 57.7 percent, of which only 36 percent reported the abuse to a primary care physician.[46] To address this problem, the Saudi government has since mandated that hospitals report any suspicions of violence, or admission of violence against women and children to law enforcement officials.[47]

This chapter examined the primary source of funding for the livelihoods of Saudi Arabian nationals, that being in the form of oil rents. Rents from oil provide subsidies such as free healthcare, education, infrastructure, employment, as well as subsidized energy and water. The topic of this research is to determine what the Kingdom of Saudi Arabia is doing to prepare for the end of rentierism when domestic oil meets domestic capacity. As this chapter has shown, all Saudi Arabian nationals enjoy some form of oil-based rents. Removing this social, cultural, and economic benefit will obligate the population of Saudi Arabia to seek their own profitable employment, pay full price for energy, water, health care, and maybe even education. The phenomenon of the rentier state mentality is pervasive throughout this country with generations of people who have never known life without oil rents. With many competing entities such as the Royal Family, the religious elite, and foreign security issues, coupled with a population that is increasing faster than the government can keep up with, the death of rentierism is inevitable in this country.

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THE POLITICAL LANDSCAPE IN SAUDI ARABIA

The Kingdom of Saudi Arabia

Saudi Arabia is a monarchy run by King Abdullah and other members of the Royal Family. Saudi Arabia was formed as a *patrimonial society*, which according to Max Weber is a society that grows out of a charismatic leadership or as an extension of patriarchalism, around one person, usually the leader of the group or tribe.[1] Saudi Arabia was formed as a patrimonial society around the economic and kin-based relationships that King Abdul Aziz formed in the Arabian Peninsula before he was able to establish official statehood for Saudi Arabia. Patrimonial states grow based on marital strategies within the family, which are meant to strengthen political alliances and the symbolic representations of the ruler as patriarch. King Abdul Aziz wedded a woman from each major tribe in Arabia in order to solidify his power and influence among the tribes of Arabia.[2]

The power and authority of the patriarch extends from his own household into society and spreads among the entire population. The development of any country occurs within a socio-economic framework and the direction of development is greatly influenced by the degree of positive responses of the people and the organizations of that country.[3] Subjects of King Abdul Aziz responded with mixed feedback during his attempt at conquering Arabia. He was able to gain the favor of the religious elite by guaranteeing them that he would spread Wahhabi Islam and operate the country as an

Islamic state under the rules of the Quran. Prior to the discovery of oil, he was able to provide protection from neighboring tribes so that the merchants could pursue their business. The Ikwan was the group that fought against him the most, but that was because he would not allow them to expand their empire into the greater areas of the Middle East after King Abdul Aziz had conquered Arabia.[4]

Some features that are staples of patrimonial societies that the Kingdom has experienced include close ties between rulers and office holders, private appropriation of office by agents who owe their power to the ruler, and the act of making the administration and the military the personal belongings of the ruler. There is a strong reliance on kinship networks and a strict adherence to tradition but the patrimonial society usually lacks formal accountability. In Saudi Arabia, Ministers and other members of the government are usually members of the Royal Family and are therefore not accountable to a higher power since they are the ultimate power. The Royal Family does seek consensus with the religious establishment but aside from that, there has been no history of formal checks and balances in the Kingdom.[5]

The House of Saud is the wealthiest and most powerful dynasty in the world. Descendents of King Abdul Aziz Saud are currently the primary wealth holders in the country. The line of succession to the throne is not via father-son but by brother-brother. The Al Saud family is estimated to be composed of upwards of 15,000 members but the most power and wealth resides in the 2,000 descendents of King Abdul Aziz. Of the 15,000 descendents, 5,000 of them hold US$400 billion of the country's currency. The government of Saudi Arabia solely consists of the elite and upper class, most of which are members of the Royal Family. The sharing of family wealth is a critical component

in maintaining the semblance of a united front for the Royal Family. Depending on how close they are to the King, these members of the Royal Family receive between US$19,000- US$270,000 per month from the royal coffers.[6] There are 30-40 new males born per month that are direct descendents of King Abdul Aziz. Each of these sons is granted US$500,000 upon birth to be put towards their future endeavors as princes. Princesses are not given any such stipend; they are reliant on the generosity of their fathers and husbands.[7] This amount is unmatched by any royal family at any time or in any place in history. Members also receive steady income from commissions, bribes, kickbacks from the oil industry, as well as income from arms deals.[8] The Kingdom and its physical entirety are viewed by the Al Saud family as being a wholly owned family asset.[9] The population of Saudi Arabia is completely dependent on the generosity of the Al Saud family to give them benefits. There is a large portion of the population that, in fact, does not receive any benefits from the nations profitability from oil. Of the 27 million nationals, 20 million qualify as being from the lower middle class to being in extreme poverty. Forty percent of the national GDP goes straight to the Al Saud family members and the rest of the population does not see the benefits of any of it.[10] Ordinary Saudi nationals who do receive direct allowances from the government only receive about US$7,000 per year from the government. This is not enough to live on, especially for women who are supporting many, if not all, of their young, and employment aged children.[11] Elderly women working in the traditional markets is on the rise because they are not allowed, due to social and cultural reasons, to work in many lines of work, leaving few means of making a living available. [12]

The perception that oil revenues are not equally distributed throughout the population is an increasing source of social discontent. The population witnesses the upper echelons of the country siphoning off all of the money and then being viewed as being nearly incompetent at their government jobs. Saudi Arabia could be considered to be a *prebendalism society,* in which offices are appointed with allocative funds to family members who then exploit the office. Nationals see that money from oil revenues often skip the national treasury and go straight into the personal bank accounts of the Royal Family.[13] According to Transparency International, Saudi Arabia earns a 62 percent rating on the Control Of Corruption test. This test measures the perception that public power is exercised for private gain. This test includes petty as well as grand forms of corruption and how much the state as been 'captured' by the elite and from private interests. The point scale ranges from -2.5 to 2.5 and Saudi Arabia earned a .1456, which is equivalent to a ranking of 62 percent. The higher the number on the point scale, the better the governance and the less perception of corruption. Saudi Arabia scored low on the scale, indicating that there is definitely a perception of corruption. On the Open Budget Index test, which measures the availability of public access to budget documents and the extent of oversight by the legislature or supreme auditing institutions, Saudi Arabia was ranked 1 on a scale of zero to 100. This score reflects that Saudi Arabia does not have an open door policy for the public to view any kind of financial documents or dealings and that there is no auditing of the budget and income by a higher power able to enforce checks and balances.[14]

While the Saudi Arabian government earns unprecedented sums of money from the oil sector, on a national scale, Saudi Arabia ranks low in regards to *economic*

freedom. Economic freedom is the fundamental right of every human to control his or her own labor and property. In an economically free society, individuals have the freedom to work, produce, consume, and invest in any manner they choose. Governments that are economically free allow and protect the right of their citizens to work and to invest how they see fit. Governments also allow labor, capital, and goods to move freely and they only limit these activities when liberty itself needs to be protected.[15]

According to the Heritage Foundation, there are four pillars of economic freedom on which each country is ranked in order to evaluate their level of economic freedom. The first pillar is the Rule of Law. This measures property rights, and freedom from corruption. The second pillar is Limited Government, which measures individual and government fiscal freedom as well as government spending. The third pillar is Regulatory Efficiency, which measures the levels of business, labor, and monetary freedom. The final pillar is Open Markets. This pillar measures trade, investment, and financial freedom. Each country is given two scores: a fiscal freedom score and a score for government spending. Since 1995, The Kingdom of Saudi Arabia's economic freedom scores have remained consistent. For the year 2012, they received a score of 62.5 for fiscal freedom and 37.3 out of a 100-point scale for government spending. Their neighbor Kuwait also received a score of 62.5 for fiscal freedom but trumped the Kingdom with a score of 47.2 in government spending. To compare, the United States received 76.3 for fiscal freedom and a 46.7 for government spending for the year 2012.[16]

While the scores for fiscal freedom are not too poor, Saudi Arabia should definitely be scoring higher for government spending, given their access to the most profitable natural resource in the world. This score simply puts a concrete number to the

face of monetary government corruption and misallocation of funds that the people of the country already recognize as being a problem.

Custodian of the Two Holy Mosques

King Abdullah

The Kingdom of Saudi Arabia is an absolute monarchy based on Islam and Sharia law. King Abdullah is the head of the government as well as the commander in chief of the military. The King appoints a Crown Prince to help with government duties, and is second in line to the thrown. Currently, Crown Prince Nayef has taken on this duty.

While the government is an absolute monarchy, the King does not have sole and unfettered power. The Basic Law established in 1993 articulates the government's rights and regulations and sets forth civil rights, the system of government, determines administrative divisions, and mandates that Islamic Law must come before all other considerations. The Quran and *Sunna,* or Islamic custom and practice based on the Prophet Mohammad's words and deeds, are considered to be the state's constitution. The government, as well as society, both agree that there should be no separation of church and state. The King has supreme authority, but he must also respect Islamic law and tradition and build consensus among members of the Royal Family and ulema*,* or religious leaders. The only way to remove a sitting king is if a majority of the Royal Family calls for his ouster.[17]

The current head of the Royal Family is King Abdullah. Born in Riyadh in 1924 to a Bedouin mother from the Rashid tribe, a tribe that has historically been enemies with the Al Saud family, Abdullah has always been the odd prince out. King Abdul Aziz had

married Abdullah's mother in an effort to cement a truce with the Rashid tribe, which was customary in order to conquer all of Arabia. King Abdullah received formal religious education as well as training to become a horseman. In 1962, King Abdullah was appointed as the commander of the Saudi National Guard. He retained that position until 1996 when he became the de facto ruler after his brother, King Fahd, had become incapacitated by a stroke. It was not until 2005 that King Abdullah succeeded King Fahd in an official capacity as King of Saudi Arabia.[18] During his tenure as de facto ruler and also as King, King Abdullah has been popular among the Saudi Arabian population for his more modern ways. He has pushed for social and political changes that included the nation's first popular elections and he moved control of girls' education from the religious elite to the Ministry of Education. He also has worked to forge closer relations with the United States in an attempt to secure national and regional security and tried to eliminate anti-Americanism among the Saudi Arabian population.[19]

One stance that King Abdullah has consistently held is that the Kingdom has fallen behind the Western world in intellectual, scientific, and technological achievements. In an effort to intellectually bolster his population, King Abdullah has invested $US12.5 billion to build a graduate institution named King Abdullah University of Science and Technology (KAUST) in Jeddah. This university is his effort at creating wealth through innovation as opposed to solely relying on income from oil. The undertaking of this academic institution is at direct odds with the religious authorities because at King Abdullah University, men and women are not segregated, the mutawa, or religious police, are banned from the property, and all religious and ethnic groups are

allowed to attend in an effort to advance academic freedom and international collaboration.[20]

Since 2009, King Abdullah has promoted sweeping changes to the cabinet by reshuffling and removing major conservative figures who had been obstacles to change. The chief of the religious police and the country's senior judge were both replaced with people who have been loyal to him and willing to enact his modern approaches to social and political change. In what observers called a 'mini revolution,' King Abdullah even appointed the first female deputy minister, which has not sat well with the religious establishment.[21] Another action that was not popular among the religious elite was the installment of more moderate and diverse members of the Council of the Senior Ulema, the group of religious conservatives that determine how judges interpret Islamic law. This drastic action signaled King Abdullah's public dissatisfaction with the radical religious elite. This reshuffling was also an effort to discipline and modernize the legal system, which currently allows judges to have an unrestrained, and often severe, interpretation of Islamic law.[22]

King Abdullah has not only tried to reform the religious establishment, education, women's rights, and international relations, he has also tried to reform his own family. One of King Abdullah's initiatives within the family has been to reduce royal corruption and entitlements. Although popular with the West and with Saudi Arabian nationals, King Abdullah has become incredibly unpopular with his family. King Abdullah had always been on the outskirts of the Royal Family in terms of ethics, politics, religious views, and overall popularity. King Abdullah has always turned his back on the typically lavish traditions of his brothers, choosing to vacation in the desert eating dates and

drinking camels milk while his brothers spend in excess of US$5 million per day vacationing in Europe. King Abdullah raised his children according to the customs of the desert and in conversation, he still uses Bedouin dialect. During King Fahd's sickness in the early 1990s, King Abdullah was accused of trying to provoke his brother in the hopes that he would die so that he may take the throne. The rest of the family did not approve of King Abdullah's reformist ideas and tried as hard as they could to keep King Fahd alive until Abdullah died. King Fahd eventually died in 2005 and one of King Abdullah's first initiatives was to begin reducing Royal entitlements by cutting back the monthly allowance of the third-generation princes. In order to make ends meet, however, the princes began to engage in even more corrupt practices than they had before. They began taking bribes from construction firms who were seeking government contracts, getting involved in arms deals, expropriating property from commoners, and selling Saudi visas to guest workers. One of the grandest schemes that the princes concocted was to borrow money from the private Saudi Arabian banks and then they would simply refuse to pay the loans back. The senior princes were engaging in thievery at a much greater scale. They were depositing revenue from oil sales into special accounts, completely bypassing the Saudi treasury altogether. The accounts were not subject to government audits or any sort of accountability.[23]

While King Abdullah has tried to limit the corruption and entitlements among the Royal Family, there are too many family members receiving stipends, making it too difficult to control. Essentially, King Abdullah has not been able to eradicate the corruption and swindling of state funds into Royal bank accounts and has only further alienated himself from the rest of his family.[24]

Crown Prince Nayef

Aside from King Abdullah being on the other side of Royal favor, the brother who creates the most problems for the King on his domestic initiatives is Crown Prince Nayef. Minister of the Interior for the past 35 years, Crown Prince Nayef assumed the position of second in command on 27 October 2011, the day that the previous Crown Prince Sultan passed from health complications. The Crown Prince is diametrically opposed to King Abdullah in most religious and political ideals and has actively vetted against many of the King's reforms.[25]

Crown Prince Nayef was born in 1933 to Hassa bint Ahmad al Sudairi. Like King Abdullah, Nayef also received religious education but was interested in politics, diplomacy, and security as well. The Crown Prince served as a mediator in disputes between King Fahd and Prince Sultan and when King Fahd's health deteriorated, Nayef's power within the family deteriorated. In 2009, Nayef became the Second Deputy Prime Minister, causing a public split in the Royal Family. The appointment allowed Nayef's influence to dominate Saudi domestic policy and allowed him to begin formulating foreign policy. In 2010, the Crown Prince undertook all Hajj-related responsibilities and he also controls the secret police. For the family members that are on the side of King Abdullah in matters of domestic social and political modernization policy, the opposing religiously conservative standpoint of the Crown Prince is a hindrance to progress.[26] The Crown Prince attempts to suppress domestic opposition with an iron fist and has a very close relationship with the clerical establishment. Crown Prince Nayef views any type of divergence from the purest version of the Wahhabi doctrine to be an erosion of the legitimacy of the Kingdom of Saudi Arabia.[27]

Further complicating matters for King Abdullah is the fact that Crown Prince Nayef is one of the "Sudairi Seven." Seven sons of King Abdul Aziz were all born to the same mother, Hassa bint Ahmad al Sudairi, and her seven sons make up the most powerful faction in the Al Saud family. King Abdul Aziz fathered 45 sons with 22 wives from tribes all over Arabia between the years 1919-1952 but none have been as powerful as the Sudairi Seven. Every Saudi king has been a son of King Abdul Aziz and to date, five sons have been King: Saud (1953-19640), Faisal (1964-1975), Khalid (1975-1982), Fahd (1982-2005), and Abdullah (2005-present). King Fahd was the first of the Sudairi Seven to become King and now Crown Prince Nayef is in line to become the next of the Sudairi Seven to take the throne. Backing Crown Prince Nayef and his religiously conservative take on how the country should be run are Princes Salman, Ahmad, and Abdul- Rahman. There are members of the Royal Family that side with King Abdullah, but Crown Prince Nayef has the backing of the remaining Sudairi Seven brothers, an unbreakable bond that competes directly with King Abdullah's progressive initiatives.[28] King Abdullah faced the opposition of the Sudairi Seven for the first time when he was Crown Prince. When King Fahd was too physically and mentally impaired to perform the duties of King, it was the Sudairi Seven band that prolonged his life and his tenure as King in an effort to prevent King Abdullah from attaining the throne. The power struggle continues to this day, with the Sudairi Seven, which includes Crown Prince Nayef, siding on all domestic social, political, and economic policy with the conservative religious elite.[29]

The Religious Establishment

The religious establishment of the Wahhabi sect of Islam has been a pervasive component in all social and political movements in Saudi Arabia since Muhammad ibn Abd al Wahhab and Muhammad ibn Saud became political and religious partners in 1765.[30] While the monarch is by definition the country's supreme religious leader and the Custodian of the Two Holy Mosques, the King still shares authority with a powerful group of spiritual leaders, the ulema. For the last 250 years, the Al Saud family has controlled the political aspect of the Kingdom of Saudi Arabia and the Al ash-Sheikh family, who are the descendents of Muhammad ibn Abd al Wahhab, have controlled the religious functions of the state. The ulema have provided the country with one of the most socially and religiously stable countries in the entire Middle East. With the political and religious cooperation of both families, the country has been able to avoid civil war and revolution that has plagued the majority of the rest of the region.[31]

The current leader of the ulema is Abdul Aziz ibn Abdullah al Ash Sheikh, who is the Grand Mufti. The Grand Mufti is the leading religious scholar of Wahhabism and enforces the directive that Islam is the way of life and is all pervasive. Al Ash Sheikh is second in prestige only to the Al Saudi family but the legitimacy of the House of Saudi is based on their alliance with the al Ash Sheikh family. In the al Ash Sheikh family, there are several hundred family members but their domination is dwindling. There are fewer replacement offspring, even though there is a high degree of intermarriage with the Al Saud family, and there are more outside religious scholars who are infiltrating the religious ranks of the ulema. Currently, only a small number of family members are wielding real power. The family suffered a setback when King Faisal abolished the

office of Grand Mufti and replaced it with the Ministry of Justice in 1969. The position was restored in 1993, but the abolishment was a political setback for the family. Many of the family members have been appointed to Saudi institutions and hold positions such as *qadis*, or judges, *muhama,* or lawyers, and *imams,* or prayer leaders as well as holding positions in state organizations where they are able to influence domestic as well as foreign policy decisions.[32]

The religious scholars in Saudi Arabia are overseen by the Higher Council of the Ulema and their input varies according to the different scenarios that the King faces, but they are present and consulted on every political, social, and economic decision he makes. The official ulema are not rubber stamps for the House of Saud, however. On many occasions, the ulema have disagreed with the Royal Family and have made political policy suggestions that have not been popular with the West, with Saudi Arabia's neighbors, or with the Saudi Arabian general population.[33]

When discussing the conflicts that have arisen between the Al Saud family, the Saudi population, and the religious elite, it is important to remember that the evolution of those relationships have occurred amidst dramatic and fast-paced change and modernization. The area of Arabia was known for being a Bedouin, trading, and merchant class part of the world, even when the country was established in 1932 and right up until oil was found. In less than 60 years, the entire country has industrialized, institutionalized, and modernized while maintaining its devotion to Islam as its sanctioned way of life. The role of the ulema is to ensure the correct application of Wahhabi Islam by enforcing Quranic law within the Kingdom.[34]

Conflict Within the Ruling Elite

Within the Kingdom of Saudi Arabia, there are many conflicting interests that make consensus on anything difficult. Politically, socially, and religiously, Crown Prince Nayef sides with the religious establishment and their principle of *tawhid*, or monotheism. The conservative religious elite considers Christians, Jews, Shi'ites, and insufficiently devout Sunni Muslims to be enemies.[35] The conservatives are anti-American and sympathize with al-Qaida, as well as other extremist groups, and condone jihad. The doctrine of tawhid ensures the tenure of the House of Saud as the ruling elite because it legitimizes the repressiveness of the Saudi state as a tool to safeguard Islam within the country. Nayef's chief concern is maintaining the status quo within Saudi Arabia. To the religious conservatives, this means living like Muhammad in the 600s, not engaging in modernization, and limiting the freedom of rights of the population.[36]

King Abdullah sides with the liberal side of the political spectrum and adheres to the doctrine of *taqarub*, or the peaceful coexistence of nonbelievers. The doctrine also seeks to expand the political community by legitimizing the political involvement of groups that Wahhabi's consider to be enemies. In foreign policy, the Saudi liberals do not condone the concept of jihad and do not necessarily believe that Islam is the only way to govern. King Abdullah has advocated for relaxing restrictions on public debate and participation, has promoted versions of democratic reform, and has also supported the reduction of power among the religious establishment and Wahhabi clerics.[37]

King Abdullah has also sought friendship and alliance with the United States by investing heavily into the United States economy, purchasing weaponry from America, and sending university students abroad to the United States to learn business, economic,

and cultural principles from American universities in order to bring back the knowledge to reform the Saudi economic situation.[38]

Wahhabism is the backbone and foundation of the entire political system in Saudi Arabia as well as the identity of every Saudi Arabian national. If the religious establishment were to choose the trajectory of their future, they would most likely choose to discontinue modernization and relinquish all ties to the West and live without what the United States and other Western allies can offer. If the liberal sector, such as King Abdullah, did not have to consult with the ulema and other family members, he would more than likely continue investing internationally and domestically in order to diversify the economy. Women would gain more freedom and the population would be able to experience greater participation in the political system. Unfortunately, the two competing brothers and their competing goals for the status quo are opposed to one another. Taking the domestic dissention into consideration with regards to preparing the economy and the society for the end of rentierism, the outlook is grim. The never-ending dissent among the differing groups in Saudi Arabia has all but paralyzed the country from diversifying, privatizing, preventing, and ultimately preparing for an economy that will no longer be able to provide for its citizens, for the ruling family, or for the religious establishment, as it has been for the last two generations of Saudi nationals.

Other Sources of Political Influence

Branches of Government

The King is aided by the Council of Ministers. There are 22 Ministers and each Minister specializes in a different part of the government, such as defense, health and

welfare, and the economy. As a body, they are responsible for drafting legislation to be presented to the King.

The legislative body, called the *Majlis al-Shura,* or the Consultative Council, has no power to act independently but is responsible for holding debates, initiating investigative hearings, and enforcing government-sponsored legislation. There are 150 members who are appointed by the King for a term of four years and the terms can be renewed. Most of the members are part of the Al Saud family and the rest are tribal leaders, businessmen, academics, and some religious leaders.

In the judicial system, there are numerous General Courts and Courts of First Instance throughout the country, led by the Supreme Judicial Council, which hear the majority of cases in the legal system. They have assumed the responsibility of approving all death, amputation, stoning, and beheading sentences. Saudi Arabia leads the world in beheadings, and it is the Supreme Judicial Council who is credited for that statistic. They operate on a more independent basis than the other branches of government, as stipulated by the Basic Law of 1993. The Minister of Justice oversees the judicial system but the King is the leader of the judicial system and he is the final court of appeal and can issue pardons. Members of the Royal Family are exempt from appearing in front of the courts and friends of the Family have been known to receive preferential treatment from judges. All courts are mandated to use the Sunna and Quran as the basis for their judgments. No one is allowed to be held in jail for a term longer than three days without being charged with a crime and according to Sharia law, the court does not give the testimony of a woman the same weight as that of a man. Sharia law also allows for the judges to throw out any testimony given by non-Muslims. The military has their own justice system

where the Minister of Defense and the King review all decisions made by the military court.[39]

The country is divided into 13 provinces, each led by a governor and a deputy governor, who are usually princes or close relatives of the Royal Family. Each province has its own municipal council that advises the governor and handles the economic and social development of the province. They also carry out resolutions passed down by the Council of Ministers and mitigate regional issues. Four times a year, each governor meets with his provincial council to evaluate the province's development and to make recommendations to the Council of Ministers regarding the provinces needs. Half of the municipal council is elected by the local population of adult males over the age of 21 and the other half is appointed by the central government.[40]

Political Influence

Political parties are illegal, are not recognized by the government if they are formed, and have no legal status in the Kingdom of Saudi Arabia. While official political parties are forbidden, distinct political divisions do exist. The most powerful group outside of the Royal Family is that of the ulema. It is their duty is to ensure that the King and his government observe Islamic law above all other considerations. The Al Saud family pays very close attention to the powerful religious majority as well as the tribal organization that is still to this day an influential and powerful force in Saudi Arabian politics. The traditional merchants still play an active role in the decision making of the Royal Family because they contribute a steady amount to government income and have always been politically influential to the ruling class in the Kingdom. A

new class of Saudi Arabian professionals is emerging due to the privatization of part of the economy and their petitions for certain reforms have been acknowledged and implemented by the ministers.[41]

In an effort to involve the public, elections were held for the first time in 2005, which were only open to male Saudi nationals. These nationals had the opportunity to elect municipal representatives. 600 men put their names in to be elected to a mere 7 seats. There was very low voter turnout because of the skepticism about the elected official's real power but the elections subdued the dialogue of democracy in Saudi Arabia. Of the 27 million people living in Saudi Arabia, only 3 million men are currently eligible to vote and women will not be able to vote until the year 2015, when they will also be able to run in municipal elections.[42]

Middle East Relations

The Kingdom of Saudi Arabia has never been a country to seek out war, and instead has been a unifier within the Middle East. Saudi Arabian foreign policy objectives have been to maintain its security, defend general Arab and Islamic interests, to promote solidarity among Islamic governments, and to cooperate with other oil producing nations. Saudi Arabia has strong ties with other countries in the Middle East, but their loyalty is with the other member countries in the Gulf Cooperation Council (GCC), which include the State of Kuwait, the State of Bahrain, the State of Qatar, the United Arab Emirates, and the Sultanate of Oman. Founded on May 25, 1981, the aim was to create a political and economic unit to promote coordination between member states in all economic, military, religious, and social areas in order to achieve unity,

founded on the creed of Islam. Combined, member nations hold 37 percent of the worlds total oil reserves and, as a group, is the largest producer and exporter of petroleum.[43] The area of the GCC is home to 42 million people with an average GDP per capita of about US$25,000 and US$917 billion worth of oil revenues.[44]

One of the beneficial features of being a GCC member is the common market phenomenon. The common market grants national treatment to all GCC firms and citizens in member countries, thus removing all trade and investment barriers. A second feature that is important to the member countries is the protection by the Peninsula Shield Force, a 40,000-man, two-brigade defense force that is composed of ground and air units. The Force was formed on the common assumption that any aggression against any one of the other member countries was an aggression against all of them. The Force is based in Saudi Arabia near the King Khalid Military City at Hafar al Batin. The Peninsula Shield Force most recently made plans to expand to 100,000 members to stop local rioting and protests within the GCC countries, but rioting had subsided before they were forced to expand.[45]

One of the most important international relationships Saudi Arabia has is that with the other members of the Organization of the Petroleum Exporting Countries (OPEC). Founded in 1960, the objectives of OPEC were to coordinate and unify petroleum policies among the member countries in order to secure fair and stable pricing for petroleum producers as well as a fair return on capital to those who invest in the industry. The member nations include the five founders; Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela as well as Algeria, Angola, Ecuador, Libya, Nigeria, Qatar, and the United Arab Emirates.[46] As the world's leading exporter of petroleum, it is vital that Saudi

Arabia preserve a stable and long-term market for its massive oil resources and OPEC provides them the platform and framework to do that. Allying with Western economies, Saudi Arabia has been the leader in following quotas and moderating drastic price movements by adjusting their output to stabilize global pricing.[47]

Saudi Arabia gained full membership into the World Trade Organization in December 2005. Other international and regional memberships include the United Nations, Arab Bureau of Education for the Gulf States, Arab Monetary Fund, Arab Sports Federation, Islamic Corporation for the Development of the Private Sector, League of Arab States, Muslim World League, and in the International Monetary Fund.[48] One of the largest monetary aid donors in the world, Saudi Arabia mainly gives aid to Arab, African, and Asian countries. Saudi Arabia is not friendly with Israel, however, and supports the position that Israel must withdraw from the territories that it occupied in June 1967. Saudi Arabia supports a peaceful resolution to the Arab-Israeli conflict, but publicly rejected the Camp David Accords, claiming that the resolution would be unable to achieve a comprehensive political solution and the status of Jerusalem would not be able to be adequately addressed.[49]

This chapter has shown that the Kingdom of Saudi Arabia is ruled by one family and the very powerful religious elite. Aside from monetary allocations and subsidies, the population has little contact with its government. Saudi Arabia is friendly with its oil-producing neighbors and is involved heavily in the joint defense of its oil. This chapter will be referred to in subsequent chapters when the reality of losing their rentier status becomes imminent. Conflict among the ruling elite will prove to be an impenetrable obstacle in the preparation for a postrentier society.

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THE END OF OIL

The first chapter discussed the history of Saudi Arabia and how it became the world's largest oil exporter. The second chapter discussed how the Saudi Arabian society relies on oil rents to fund their lives. The third chapter discussed the ruling elite and how with their dissent, they will have a difficult time preparing for the end of rentierism. This chapter will discuss the end of oil--the reason why the Kingdom of Saud Arabia will change forever, as we now know it.

It is not feasible to attempt to predict when the last drop of oil will be pumped from the ground. It is feasible and imperative, however, to determine when Saudi Arabian domestic production will equal domestic demand. The population in Saudi Arabia is expanding at a rapid rate. With a rapid growth comes a rapid domestic demand for more oil. This chapter will discuss the definitions of petroleum, it will analyze Peak Oil theories, and it will predict when the last barrel of Saudi Arabian oil will be exported for profit.

The Definition of Petroleum

Petroleum is defined as the mixture of liquid hydrocarbon and compounds, which contains hydrogen and carbon in varying combinations with other elements. Petroleum is found in marine sedimentary basins which are overlain by ancient seas millions of years old.[1] The question of whether or not this nonrenewable resource will actually run out is

irrelevant. It is a nonrenewable natural resource that has a lifespan and is finite. It is nearly impossible to predict the end of oil on a global scale. It is difficult to predict the end of oil on a national scale. In the case of Saudi Arabia, the point is not when oil will run out but when domestic demand and consumption will equal that of domestic production, making the production of oil a zero sum game. Once domestic consumption equals production, and there are no extra barrels to export for profit, is when Saudi Arabia will cease to be rentier. The standard of living for each Saudi national will decrease significantly if government income alternatives of an equal or greater value to that of oil exportation are not found and implemented quickly. In order to predict when that will happen, it is necessary to understand the science behind Peak Oil, to make educated guesses about remaining oil reserves, and to quantify future domestic and international energy demand. Gauging the political atmosphere now and in the future is also key in determining when production will equal consumption and when the death of rentierism in Saudi Arabia will occur.

In the world of oil, the global classification system for assessing remaining oil reserves has been devised by the Society of Petroleum Engineers (SPE) and the World Petroleum Congress (WPC). They classify reserves into three categories; proven reserves, probable reserves, and possible reserves. Western Texas Intermediate (WTI), also known as Texas Light Sweet, is a grade of crude oil used as a benchmark for oil pricing. It is "light" because of its low density and it is "sweet" because it contains little sulfur. Texas Light Sweet is the underlying commodity of the Chicago Mercantile Exchange (CME). The price of Brent Crude from the North Sea and Dubai Crude are important oil markers for future oil contracts. The OPEC Reference Basket, which is a

weighted average of petroleum blends produced by OPEC countries, is crucial for setting production quotas among OPEC nations and international pricing strategies of their commodity.[2]

Peak Oil Theory

In 1956, Marion King Hubbert first made his Peak Oil model public. Using a rule of thumb by the first petroleum engineers, Hubbert observed the production curve over time in a well-researched oil province in the United States and came to generate his first Peak Oil conclusions. Hubbert's model states that by starting at zero, production will grow over time until it peaks when half of the existing recoverable resources have been extracted, or midpoint depletion. At this point, production will decline at the same rate at which it grew. Production will take the form of a symmetrical, mirror image bell curve. The area below the bell curve represents the cumulative production of an oil province or Ultimate Recoverable Resource (URR). Hubbert's theory claims that if an oil field has been sufficiently explored, it is possible to forecast when it will achieve peak production and when the field will run out of oil.[3]

Hubbert's original model accurately predicted Peak Oil production of the 48 lower states in the United States by predicting that Peak Oil would occur in 1970. The success with his model is attributed to the fact that the United States was and still is the most intensely explored and exploited area in the world for oil fields. The knowledge of its subsurface is more well-known than any other region in the world by a factor of 100. Just in the state of Texas alone, more than one million wells have been drilled, compared to 2,300 in Iraq. There are 560,000 wells in production in the United States and only

1,500 in Saudi Arabia, the world's largest exporter of oil.[4] According to Hubbert, global per capita production peaked in 1979 and world oil production has been flat since 1998. Hubbert claims that world oil peaked on November 24, 2005.[5]

Kenneth Deffeyes' theory takes a slightly different approach and calculates the point at which the proportion of annual production will be equal to zero at the current production trends. The model calculates the total volume of oil that will be predicted to be removed from the oil fields before the production of oil ceases.[6] His Peak Oil date is calculated to be when half of all of the oil that ever existed in the world had been extracted. The first half is thought to be the easiest to extract, the most economically obtained and is of the highest quality that is the cheapest to refine. The second half lies in places not easily accessible such as the Arctic or deep in the ocean. The rest is difficult to extract and may take too much energy or not be cost-effective to retrieve. Even oil that is in high sulfur crude, tar sands, and oil shales were part of his prediction. These types of oil deposits are not liquids like the typical petroleum found in the Saudi Arabian oil fields. Instead, it is found as a solid and must be mined before it can be liquefied.[7] With this model, Deffeyes posited that oil fields go through a predictable oil production cycle and that peak production occurs roughly 40 years after the discovery of oil in an oil field. His research shows that the United States peaked after 40 years of production. The North Sea peaked at 30 years because it was a more recent find and technology had already been developed to increase production, which was applied to those fields, speeding up the extraction. Deffeyes claims that global oil discoveries peaked in 1963. He claims that oil is being consumed four times more rapidly than it is being discovered.[8] The ratio between current global reserves and current global

consumption predict that global proven oil reserves have a lifespan that will end 31 years from now. By the year 2043, global proven oil reserves will be in the dusk stages of their lifespan. An argument against this time frame can be that it does not take into consideration future demand, which will more than likely be higher and it also assumes that consumption grows while reserves and resources remain fixed.[9] This argument then assumes that 31 years is too far into the future and that proven oil reserves may be depleted sooner than 2043.

The problem with Hubbert's Peak Oil model, Deffeyes' model, and other Peak Oil observers is that they do not take into consideration political decisions, changes in consumption, pricing strategies, technological evolution, security threats, warfare, and population fluctuation. Another problem is that the models can only be applied to oil fields, areas, regions, and countries that have been intensely explored and developed for oil production using the highest level of technology. Peak production can be delayed due to political unrest, advances in technology, and a decline in demand or even quotas, which will push the tail end of the bell curve to the right and into the future.[10]

Hubbert and the theorists that adhere to his model follow the Central Limit Theorem, which states that the sum of a large number of erratic variables tends to follow normal distribution, landing in a bell curve formation. Hubbert, as well as Deffeyes, underestimated the fact that while the United States was a successful example of their theories, because it had been intensely explored and reserves were fairly predictable, the rest of the world is not the United States.[11] While these models have been a useful tool to get a ball-park estimate on global Peak Oil, they fall dramatically short of explaining and predicting the political, social, and economic future of Saudi Arabia.

The best information that has become available is that World Peak Oil Production (WPOP) occurred between 2000-2008. The date is inaccurate because the private sector and nationalized oil companies tend to routinely overestimate their oil reserves. WPOP manifested over several years of oscillating market instability and volatile periods of price shocks and recessions, which dampened demand and price, indicating a terminal and irreversible decline in demand as well as production. The actual Peak Oil date will take years to determine because the only way to analyze it is from a rearview mirror approach.[12]

Common knowledge among the world's leading petroleum geologists is that more than 95 percent of all recoverable oil has already been found. Mankind has consumed 2.5 trillion barrels of conventional crude oil since the first well was drilled and have consumed about 30 billion barrels per year. According to US Energy Oil and Gas Industry Solutions, 90 percent of all reserves are now in production, suggesting that few major new discoveries will be made in the future of new oil deposits. In 2001, there were eight new large scale discoveries in the world. In 2002, there were three large discoveries and there have been no significant discoveries of new oil since then. Since 1981 the planet has consumed more oil than has been discovered, leading geologists to believe that there are no more large scale discoveries left to be made. Given the development and sophistication of new technology and the education of geologists since the first discovery, it is highly unlikely that any area large enough to be of significance for new oil has eluded the attention of the industrious oil companies and their engineers.[13]

Predicting Remaining Oil Reserves in Saudi Arabia

Oil reserves are finite and it is inevitable that there must be national preparation for the end of oil. Many want to believe that it will not happen, or that it will not happen within our lifetime. While it may not happen within our lifetime, it is never a good policy to plan for the best and to also hope for the best. Saudi Arabia is doing just that, planning for the best. It may be argued that because the activity of predicting remaining oil reserves can be difficult, if not impossible, that it must mean that worrying about the end is also too difficult, if not an impossible task. Saudi Arabia is notorious for not accurately and honestly reporting their remaining oil reserve numbers to the public. This leads one to believe, assuming that their petroleum engineers actually do have a good idea of what their reserve numbers are, that they are either under-reporting to extend the life of international investment into oil, keeping prices stable, or they are over-reporting their numbers in order to prevent a global oil shock. Either way, the practice of predicting oil reserves is complicated, even for a country with as much oil as Saudi Arabia.

The U.S. General Accounting Office Report

By the 1970s, Saudi Arabia had just realized the extent of their power as a global oil producer. Out of nowhere, this poor, newly established country was wielding power and global responsibilities that were disproportionate to their history, small population, culture, military insignificance, and archaic government institution. They were willing to play by the rules of the international oil cartel, OPEC, however, even though they had enough oil and enough power as the planet's only swing producer to set their own terms. By the mid-1970s, their giant and super-giant oil fields were already showing their first

signs of normal aging. This was possibly accelerated due to their policy of raising production quickly in response to world demand and a hunger for the unprecedented profits the Kingdom was earning.[14]

In 1978, the United States government recognized the degree to which the rest of the world also depended on Saudi oil and became concerned about the reliability of Aramco and the Kingdom's oil production and supply capabilities. At the time of the investigation, Aramco was very forthcoming in showing the world how their operations worked. Aramco divulged that they produce 97 percent of all Saudi output and the balance comes from the Neutral Zone and the Abu Sa'fah field shared with Bahrain. Of Aramco's total output, 93 percent came from just four oil fields: Ghawar, Safaniya, Abqaiq, and Berri.

The report compiled by the U.S. General Accounting Office (GAO) on Saudi oil supply noted that all four fields were nearing maturity. The report also provided statistics on proven oil reserves given by Aramco at the time. Aramco estimated that total proven oil reserves ever discovered in Saudi Arabia equaled 110 billion barrels, of which 70 billion barrels were from the four super-giant oil fields. The Ghawar field alone still accounts for half of the total. Ghawar is the largest oil field in the world measuring 170 miles long by 31 miles wide and it produces 6.5 percent of the world's daily oil production.[15] Ghawar continues to remain the largest oil field in the world, even with the rate of production decreasing by 8 percent per year and 55 percent of the outflow is watercut.[16]

The methodology used to determine the reserves was the same that was mandated by the U.S. Securities and Exchange Commission (SEC) for use in all their reporting

since the Aramco reserves were the largest contribution to the end of year report for the shareholders. The GAO report claimed that from the date of discovery, only 25 percent of the total reserves had been produced.[17] Combined, the 15 oil fields in Saudi Arabia were producing 9.2 million barrels per day (mbd) of oil out of only 800 different wells. In comparison, The United States at the time was similarly producing 9.9mbd, but out of 500,000 different wells. The report also noted that Saudi Arabia had 23 proven oil fields that were not yet in production. Aramco's drilling program at the time was aimed at further developing the current wells, rather than searching for new oil fields. Aramco added to the GAO report that the yet-to-be-developed reservoirs in the four super-giant oil fields could probably yield an additional several hundred million barrels of oil. A year later, when Aramco was taken over by the Saudi Arabian government and operated by a Saudi Arabian management team, they adjusted reserves in the same oil fields upward an additional 50 billion barrels and eight years later, they changed the number again and added an additional 100 billion barrels, after making no new discoveries and without the use of any new technology.[18]

The second part of the GAO report in 1978 discussed the technical issues that would affect Saudi oil production. The most pressing issue was the rate at which high individual well flows were being produced. The report suggested that if any of the wells were 'rate sensitive,' the rate being used would adversely affect and alter the quantities of oil that could ultimately be recovered. Aramco's engineers told the GAO investigation team that the reservoirs were not rate sensitive and that the current rate, at the time, of oil production would not reduce the ultimate recovery from the field. Aramco did not recognize the danger of overproduction and rate sensitivity and believed that the only risk

in overproducing would be an increase in the fields' final production cost. The Aramco technicians went on to assume that the key oil fields could boost production by as much as 50 percent without significantly affecting the volume of recoverable oil.[19]

It is unclear why and how the technicians came to the conclusion that Saudi oil fields were not rate sensitive. All technical oil experts in the world know that all reservoirs are rate sensitive. It is also unclear why Aramco would think that altering the production levels by increasing capacity on a rate sensitive reservoir would not damage reservoir pressure. Saudi Arabian reservoirs were later found to be more fragile than normal and were termed Super-K Zones, zones that are more porous and fragile than other zones. The Zones were distinct in the fact that they had a rare presence of extremely high permeable rock that generated abnormally large deposits of oil and made high productivity much easier and allowed for the use of water invasion.[20]

At the time of the GAO report in 1978, Aramco was injecting 9.2 million barrels of seawater into the Ghawar oil field, or watercutting, to produce 5.9mbd worth of oil. The other four fields were also receiving massive water and gas injections in order to maintain high pressure in the reservoirs. Aramco officials, who at the time were still American oilmen, ignored concern over the maturity of these oil fields. The Western upper management who made all of the decisions regarding the Saudi oil fields were responsible to Western shareholders to pump out as much profit as they could before all operations of Aramco moved to Saudi hands in 1980. The transition from American to Saudi hands occurred between 1974 and 1980 and during that time, production tripled, leaving investors happy and oil fields damaged.[21]

Saudi Aramco

Once operations of Aramco were transferred into Saudi hands, specifically Saudi Oil Minister Ahmed Zaki Yamani's hands, all reporting on oil field data in Saudi Arabia stopped. Between 1950-1982 the member countries of OPEC provided detailed oil production data of each oil field to sources such as the *Oil and Gas Journal* on an annual and even semi-annual basis. As the dominant member country in OPEC, Saudi Arabia took a stand to discontinue releasing statistics, and the rest of the member nations followed suit and also ceased releasing their data. This put an end to any and all oil data and production transparency. This left investors, the media, and consumers around the globe to merely guess at the production of Middle East oil.[22] Over the next 20 years, it was anyone's guess as to where oil reserves stood. Because the world was in the dark about Saudi Arabian production, it came as a surprise in 2003 when signs emerged that Saudi Arabia had already hit Peak Oil. With Iraq's oil industry in shambles, Venezuela's oil industry crippled by the Venezuelan opposition who wanted to oust President Hugo Chavez, Nigeria's oil industry intermittently paralyzed from civil disorder, and the North Sea depleting at 5 percent annually, Saudi Arabia was rumored to be pumping at full capacity. Daily production hovered around 8.7mbd in 2003 and in 2004 it only increased by 3.7 percent to 9.1mbd. When the world needed more oil, Saudi Arabia was unable to produce, and the world noticed. With prices soaring at US$50 per barrel in 2004, up from US$37 the year before, the Saudi's no longer had the option to increase production and stabilize global oil pricing. Prices have since continued to increase and Saudi Arabia has not been able to manipulate production to keep the prices from rising. Saudi Arabia is no longer the reliable global swing producer.[23]

In the first months of 2012, the status of the Saudi Arabian oil fields and the production capacity looked to be stagnant. After 30 years of intense geological and geophysical efforts coupled with exploratory drilling the country over, Saudi Arabia has failed to discover any significant new fields since 1967 when low-productivity and complex fields in the Hawtah Trend were found. Real data on how much oil was being produced is still as cloaked as ever. The Energy Information Agency (EIA), Middle East Economic Survey, individual petrologists, geologists, and engineers have published reports indicating that Saudi Arabia has 260.1 billion barrels of oil left in their reservoirs.

Saudi Aramco has settled on publishing their countrywide reserves also at 260.1 billion barrels of oil reserves remaining. This has left speculators no choice but to accept that number as their official operating goal of Saudi Arabia. At the beginning of 2012, Saudi Aramco officially reported producing an average of 7.91 million barrels per day for a total of 2.887 billion barrels produced per year. They claim to have just reached the mark, through new technology and investment, to meet 12mbd spare capacity. The Saudi Arabian government owns a majority share in Aramco, which is the world's largest oil company in relation to production as well as reserves. They are the world's most sophisticated, fully integrated petroleum company with capabilities in exploration, production, refinement, marketing, distribution, and shipping. The company of Saudi Aramco single-handedly produces more oil than any other country. They are also the top producer and exporter of associated natural gas liquids (NGL), with 316.4 million barrels exported in 2010. Saudi Aramco holds the fourth largest share of gas reserves at 279 trillion cubic feet and has a worldwide refining capacity of 4.16 mbd, which includes domestic refineries and international joint and equity ventures. Their tanker fleet includes

14 double-hulled Very Large Crude Carriers (VLCC), one single hulled VlCC, and four product tankers. Saudi Aramco employs nearly 55,000 people, 48,000 of which are Saudi nationals, the remainder being expatriates mainly from the United States, the United Kingdom, and Japan.[24]

New Technology, Innovation, and Investment

Saudi Aramco states that their current focus is on expanding their capability to discover, produce, process, and transport natural gas. They aim to explore for non-associated gas reserves to meet the global demand for gas to fuel industries. By the year 2014, they plan to expand gas production and processing capabilities by 40 percent to a total of 4.5 billion standard cubic feet. Saudi Aramco is in line to also become the next largest supplier of hydrocarbon resources. The new vision of the company, as well as for the government, is to become a fully integrated global energy and chemicals magnate with operations around the globe. In order to continue with their new innovation strategies, Saudi Aramco has formed two centers devoted to original research and development. The first center is the Advanced Research Center, which works with the Exploration and Petroleum Engineering Center (EXPEC ARC) in order to research new technology in the subsurface upstream activities of oil and gas fields. The goal of this research center is to discover new oil resources and to improve the recovery process of existing oil producing reservoirs. To achieve these goals of improved increased production, Saudi Aramco employs six development teams composed of a total of 250 scientists to focus on four strategic areas. The Geophysics Technology department focuses on improving the insight into regional distribution of oil and gas reservoirs. The

Reservoir Engineering Technology department is used to understand the subsurface rock and fluid systems' spatial distribution, size, and quantities. The Computational Modeling Technology department area requires the teams to learn more about subsurface flow mechanisms and their processes. The Production Technology and Drilling Technology department is the fourth strategic area and is in charge of the development and application of new technologies that stimulate reservoirs to release the most economic quantities of oil and gas. Since 1950, Saudi Aramco has been granted 100 patents related to gas and petroleum recovery. Patents and new technological discoveries have gone up drastically since the evolution of the Idea Management System (IMS) in 2002, an employee idea forum that that has led to an open and welcoming environment for employees to share their ideas.[25]

Since the formation of EXPEC ARC in the early 1980s, many new phases of innovation and advanced gas and petroleum technology have been engineered. New advancements in the areas of land seismic simulation and visualization have been EXPEC ARC's crowning achievements. Three industry-leading breakthrough pieces of technology have included GigaPOWERS, Resbots, and DesertRay oil fingerprinting. In 2010, Saudi Aramco debuted GigaPOWERS (Parallel Oil, Water, and Gas Reservoir Simulator), which is simulation technology capable of viewing billions of cells at seismic resolution. The simulation models are created by integrating all of the data obtained from the interrelated workings of reservoir mechanics, fault systems, oil flow, and waterflood fronts. The technicians also take data from the associated gas that bubbles out of the crude oil which then forms gas caps in the reservoirs. This technology allows for the company to simulate all the giant and super-giant oil fields in Saudi Arabia in their

entirety with accuracy in order to achieve reservoir, drilling, and production efficiency. This technology further provides insight into analyzing and thus predicting production rates of the fields. Scientists have been able to identify bypassed oil zones and additional zones, which has led to the drilling of new wells. GigaPOWERS has also given management the ability to calculate the optimum number and placement of wells, a better estimation of the rate of recovery, and has allowed for better reservoir management strategies.

A second major technological development created out of EXPEC ARC is Resbots. Resbots are nano-agents that are injected into the wells and then recovered after their journey through the reservoir where they gather data about the wells and record the characteristics and fluid properties. The Resbots also release chemicals into the wells while they are travelling to improve reservoir conditions for enhanced recovery.

The third technological advancement to be debuted from Saudi Aramco in 2010 was the DesertRay oil fingerprinting system. The mobile system allows for scientists to identify oil contamination by analyzing samples to see if there are any changes to the 'fingerprint' of the type of oil. Each type of oil contains its own fingerprint, a concoction of unique chemical features unique to each type of oil found in the subsurface. The DesertRay uses lasers to analyze the pure oil and the blends and then it formulates two-dimensional contour diagrams which represent the fingerprint of each sample of oil. The diagram detects if there has been any degradation or contamination to the oil and the rest of the oil in the well from which the sample came. The results are generated in 30 seconds and can be used as an investigative tool for geological continuity assessment.[26]

New well design and drilling practices have also added to Saudi Aramco's new technology boom. Early wells became extinct in the mid-1990s. Early wells were vertically drilled, which was common in the oil industry in the first years of oil production. New drilling techniques created a second generation of wells, defined as extended reach horizontal wells. These wells replaced the vertical wells but soon, a third type of well replaced them both. These wells are called maximum reservoir contact wells (MRC), which have drastically refined the horizontal reach configuration. These wells have multibranching lateral wells off of the main wellbore. The sophistication of technology allows for the down-hole sensors to automatically turn off to avoid the water at the bottom and gas at the top that closes in on the narrowing oil columns of the aging giant and super-giant oil fields.[27] Other technological advancements include the practice of underbalanced drilling, the use of diamond-tipped bits, expandable tubular drill columns, top-drive drilling systems, high temperature and pressure gauges, and instantaneous satellite communication from the drilling rig to the computer stations in Dhahran. Acid and hydraulic fracturing to open tight channels in the reservoirs has also become standard procedure for Saudi Aramco in their quest for more oil.[28]

Beginning in 2004 and continuing through 2010, Saudi Aramco underwent a massive expansion program. The company invested $US18 billion to generate an increase in barrel-per-day production. The Kurais project was the single largest crude oil increment project in the history of Saudi Arabia and it generated an additional 1.2mbd of Arabian Light crude oil production capacity. The combined investment into Abu Hadriya, Fadhili, and Khursaniyah contributed an additional 500,000 barrels per day of Arabian Light crude production capacity. The Shaybah expansion generated 250,000

barrels per day of Arabian Extra Light crude and Nuayyim contributed 100,000 barrels per day of Arabian Super Light crude production capacity.[29] This investment into crude production capacity expansion did not create any additional barrels per day for export and profit. Instead, these barrels are replacing the barrels that have been lost to the depletion of the aging oil fields throughout the country.

Depleting Oil Fields

Saudi Aramco claims to have 112 gas and oil fields within its borders. Ninety percent of the oil produced in Saudi Arabia comes from its six largest oilfields: Ghawar, Safaniyah, Abqaiq, Berri, Zuluf, and Marjan. They are concentrated in the Eastern Province along the Persian Gulf in a corner of the country covering only 17,140 square miles, a little larger than the size of Switzerland. As previously noted, no oil fields of any substance have been discovered in Saudi Arabia since 1967 when Shaybah was discovered. Saudi Aramco has relied on four oil fields to provide the bulk of their petroleum.

Ghawar, the largest and most productive oil field in the world, has produced 55 billion barrels of high quality Arab Light crude since 1951. In comparison, the United States' largest oil field is Prudhoe Bay, which has only produced 10 billion barrels. In its peak year of production in 1981, Ghawar was producing 5.6 million barrels per day. As of 2012, it is estimated to be producing 5mbd, or 6.25 percent of total global oil production. Ghawar also produces approximately 2 billion cubic feet of associated natural gas per day as well. It is predicted that total oil reserves for the oil field are approximately 80 billion total barrels.

Safaniya is the world's largest offshore oil field and is the second largest Saudi oil field. Safaniyah produces the majority of Saudi's heavy crude oil and since it was discovered in 1950, Saudi Aramco has produced 10 billion barrels from this field. This statistic only elucidates the extreme importance of Ghawar, since Safaniyah has only produced one-fifth of the oil that Ghawar has, in their similar life span. Safaniyah at its peak, also in 1981, produced about 1.5mbd and is predicted to be producing about 500,000 barrels per day in 2012 and have total reserves of 30 billion barrels. Oil in Safaniyah is found in sandstone formations instead of carbonate rocks like Ghawar, Berri, and Abqaiq. Because Safaniyah lies on the massive Wasia aquifer, which lies beneath the oil-bearing sandstone, pressure remains high in the reservoir, which keeps oil easily flowing to the wells. Zuluf and Marjan also lie on this aquifer and none have ever received water injections.

The Abqaiq and Berri oil fields only produce about 430,000 barrels per day and they are estimated to only have about 12 billion barrels each, in total. Abqaiq peaked in 1973, producing 1mbd, and Berri peaked in 1976 while producing 800,000 barrels per day. These two oil fields, however, only produce premium value Arab Light and Arab Extra Light crude grade oil.[30]

Only 5 to 10 more fields in Saudi Arabia produce in excess of 100,000 barrels a day, and at that, they are unpredictable and unstable. There are still three areas in Saudi Arabia that have gone unexplored, and had there been hope that there were reserves to be found, Saudi Aramco would have already explored these areas. The unexplored parts of Saudi Arabia include the bottom third of the Empty Quarter, or Rub al Khali. This vast desert constitutes one-fifth of the Arabian Peninsula but has shown no promise for oil

discovery. The second unexplored area is the deepwater area of the Red Sea and the third is the strip of land along the western desert on the border of Iraq and Saudi Arabia.[31] Of all the early wildcatting and drilling exploration done in Saudi Arabia, no one has been able to find any fields that could hold a candle to Ghawar or even any of the smaller fields. It is unlikely, even if extensive exploration were to be performed in these areas, similar to what has been done throughout the rest of the Arabian Peninsula, that a miraculous discovery would be made. While it is not entirely safe to say that new oil field discovery in Saudi Arabia is impossible, statistics do not give the notion much hope. Saudi Arabia and the rest of the world must assume that the oil fields they have now will probably be the only fields they will ever have.

Predicting the End of Saudi Arabian Oil Exports

Previously in this chapter, facts were discussed regarding Saudi Arabia and Saudi Aramco's refusal to release reliable data about their oil fields, their oil productions rates, oil field depletion rates, and even how many barrels of oil reserves they predict are still in the ground. The media, scientists, geologists, investors as well as competing oil companies have had to simply guess as to what the real numbers could be. The point of this thesis is not to determine Peak Oil or to attempt to predict when oil will run out in Saudi Arabia. The problem that Saudi Arabia faces is the timeframe of when domestic consumption will equal domestic production. Currently the country is still able to pump oil, because there is plenty of oil in the ground, according to Saudi Aramco. Being that Saudi Arabia is a rentier state, it provides and subsidizes benefits for its citizens such as education, healthcare, and most importantly in this case, oil. Unless the House of Saud is

planning on retracting the energy subsidization benefit for Saudi nationals, the Saudi Arabian government must provide oil and energy for its citizens, all while the population is exploding and oil production is slowly depleting.

At the beginning of 2012, the population of Saudi Arabia hovered around 21.4 million nationals with an additional 5.6 million nonnationals and expatriate workers. [32] The domestic population growth rate is 2.18 percent. [33] This population bomb, if not controlled, will consume the last bit of exportable oil, eventually rendering the government bankrupt. A full 80 percent of government budget revenues and 90 percent of export earnings come from the export of oil.[34] Large amounts of data have been compiled to predict the increase in population growth rates, the increase in domestic consumption demand, as well as determining break-even points for government revenue.

For this mathematical model, a set of data must be assumed. The base population for 2012 is calculated to be around 27 million. The base population growth is set on the far spectrum of increasing by 2.63 percent and on the near spectrum of growing at 1.55 percent. These statistics were calculated using the law of averages of The World Bank, the CIA, the United States Department of State, and using past growth trends. As of 2012, current domestic consumption of oil per barrel equals 24.48 barrels per Saudi inhabitant with domestic demand increasing by 4 percent per year.[35] In his book *Twilight in the Desert,* Matthew Simmons uses technical papers from the Society of Petroleum Engineers from 1960-2005 to conclude that the rate of depletion in the Ghawar oil field is 8 percent per year. Being that Ghawar is the largest oil field in the world and produces in excess of 5mbd for a total of 1.825 billion barrels per year, which equals more than 63 percent of total oil production for Saudi Arabia, 8 percent is used as an overall oil field

depletion level for the entire country. US$100 per barrel is used as a base line for oil income, since the cost per export barrel has not gone below US$100 per barrel since 2011, and being that Saudi Arabia has proven that it is unable to be the swing producer it used to be, it must be assumed that without significant discoveries in Saudi Arabia or abroad, the cost per barrel is unlikely to drop below US$100 per barrel in the future. By using the most reliable, yet nonetheless questionable, statistics of Saudi oil reserves as hovering around 260.1 billion barrels and yearly production of 2.877 billion barrels per year, a bench mark for future oil production and consumption predictions has been set.

In order to calculate the rate at which domestic consumption will equal domestic production, the data were broken down into *worst-case scenarios*, *best-case scenarios*, the *impossible scenario* and the *most likely scenario*.

The *worst-case scenario* uses an 8 percent depletion rate coupled with a population increase of 2.63 percent and a domestic barrel depreciation rate of 8 percent as well as using current production of 2.877 billion barrels per year. When calculated, the worse case scenario for Saudi Arabia is that domestic consumption will equal domestic production in the year 2022. Domestic consumption would equal 98.2 percent of total production. With a population of 34 million and a consumption rate of 36.17 barrels per person, per year there will only be 21 million barrels available for export and profit from export will be only US$2.1 billion, down from a 2012 income from oil exports of $222.6 billion. In the following year, 2023, in this model, Saudi Arabia would be shy 158 million barrels to meet domestic demand, and would not have had even one barrel for export.

The *best case scenario* assumes there is no depletion rate with a population increase of only 1.55 percent per year, a static per person consumption rate of 24.48

barrels per person, annually and using current production of 2.877 billion barrels per year. When calculated, the best case scenario is that by the year 2050 with a population of 49.9 million, domestic per person consumption static at 24.48 barrels annually, domestic consumption will still only be 41.7 percent of domestic production and the country will still have 1.65 billion barrels per year for export with a national income of $165 billion per year.

The *impossible scenario* assumes that Saudi Aramco would be able to increase production to 12mbd for a total of 4.380 billion barrels per year and continue at the level. This scenario also assumes that the population will only grow 1.55 percent per year and that domestic consumption remains at 24.48 barrels per person per year. In this scenario, Saudi Aramco would have increased their domestic production to meet their self-labeled excess capacity reserve amount of 4.380 billion barrels per year, equaling an income profit, after domestic consumption is accounted for, of US$317.5 billion per year on 3.17 billion exportable barrels. This is 'impossible' because while Saudi Aramco claims that they are able to meet their excess capacity goal of 4.380 billion barrels per year, they have yet to do so, even when global oil prices are skyrocketing. They have failed to increase demand, being no longer a swing producer, and prices continue to increase.

In the *most likely scenario,* production depletion would be reduced to 4 percent per year. This would be a more likely depletion rate if new technology actually does enable Saudi Arabia to replace depleted reserves. This scenario assumes that there are no new oil field discoveries and that production remains at 2.877 billion barrels per year. The population increase is more likely closer to the 1.55 percent, since advancements in birth control and public education seem to be working to educate the public on having

less children, reducing the increase in population. The domestic demand growth rate is paired down to a mere 1 percent increase in consumption per year per person, owing to the fact that the government is improving social education on conservation. This scenario reveals that a more likely year for production to equal domestic consumption is in 2033. In this year, domestic consumption will equal 97.1 percent of total domestic production with the next year increasing to 103 percent, or more than what the country can produce in total. In 2033, there will only be 33 million barrels available for export with a national profit of a mere US$3.3 billion.

Comparing these scenarios, there is not much difference between the worse-case scenario of domestic oil consumption equaling domestic production in the year 2022 and the most likely scenario of 2033. The best case and impossible scenarios are far stretches for a country that continually behaves as if it has an unlimited about of oil. In one sense, Saudi Arabia does in fact have enough oil to last them at least 100 more years. By taking the current Saudi Aramco statistic of 260.1 billion barrels of reserve oil and decreasing that by a current production rate of 2.877 billion barrels per year, in the year 2100, there will still be more than 6 billion barrels of oil left. The concerning aspect of these mathematical models is not whether or not Saudi Arabia is running out of oil, but how much Saudi Aramco can produce in a given year using current technology and in rate sensitive oil fields. With technology and oil extraction stagnant compared to the booming, oil hungry population, Saudi Aramco will not be able to keep up. This fact cannot escape Saudi Aramco, and the rest of the world will be in for a real oil shock when Saudi Arabia is no longer able to export at the levels the rest of the globe is used to receiving. It will be as if Saudi Arabia were out of oil.

Notes

[1] Arabian American Oil Company. *ARAMCO Handbook- Oil and the Middle East.* Netherlands: Joh. Enschede en Zonen-Haarlem, 1968, 64.

[2] Ibid., 243.

[3] Maugeri, Leonardo. *The Age of Oil.* Westport: Praeger, 2006, 202.

[4] Ibid., 204.

[5] Deffeyes, Kenneth S. *Beyond Oil- The View from Hubberts Peak.* New York City: Hill and Wang, 2005, 177.

[6] Hallett, Steve and John Wright. *Life Without Oil.* Amherst: Prometheus Books, 2011,121.

[7] Kunstler, James Howard. *The Long Emergency.* New York City: Atlantic Monthly Press, 2005, 24.

[8] Hallett, *Life Without Oil,* 122.

[9] Maugeri, *The Age of Oil,* 213.

[10] Ibid., 215.

[11] Ibid., 203.

[12] Kunstler, *The Long Emergency,* 25.

[13] "Peak Oil Information and Strategies." *Oil Decline.* www.oildecline.com (accessed 23 February 2012).

[14] Simmons, *Twilight in the Desert,* 70.

[15] Kunstler, *The Long Emergency,* 77.

[16] Ibid., 78.

[17] Ibid., 71.

[18] Staats, Elmer. "Critical Factors Affecting Saudi Arabia's Oil Decisions." *By the Comptroller General Report to the Congress of the United States.* 12 May, 1978.

[19] Ibid.

[20] Simmons, *Twilight in the Desert,* 74.

[21] Ibid., 76.

[22] Ibid., 78.

[23] Kunstler, *The Long Emergency,* 77.

[24] *Saudi Aramco.* www.saudiaramco.com. (accessed 15 February 2012).

[25] Ibid.

[26] Ibid.

[27] Simmons, *Twilight in the Desert,* 113.

[28] Ibid., 114.

[29] *Saudi Aramco.* www.saudiaramco.com.

[30] Simmons, *Twilight in the Desert,* 119.

[31] Ibid., 124.

[32] Ibid., 125.

[33] "Saudi Arabia." *World Factbook- Central Intelligence Agency*. www.cia.gov/library/Publications/the-world-factbook/geos/sa.html (accessed 15 February 2012).

[34] Ibid.

[35] Mahdi, Wael. "OPEC Oil Exports Fall 2% as Saudi Shipments Decline." *Bloomberg.* 19 February 2011. www.bloomberg.com/news/2011-02-19/opec-s-december-oil-Exports-fall-2-as-shipments-from-saudi-arabia-drop.html (accessed 23 February 2012).

OIL CURSE

In the previous chapter, it was predicted that oil will move from a national treasure and primarily the sole income of the Saudi Arabian government to a commodity that is purely subsidized for the national population sometime between the years of 2022-2033. In the year 2012, oil remains the main export that provides the government with the opportunity to subsidize many aspects of a Saudi Arabian's life, including healthcare, education, and energy. Saudi Arabia is considered to be a rentier state because it is able to provide all of these goods and services without having to tax its population. To be rentier, a state is required to earn an income that originates from outside of the country from a product, usually a natural resource, which requires little domestic effort or manpower to produce. The fact that in the near future, Saudi Arabia will not be able to produce enough oil in order to provide for domestic consumption as well as for export threatens their ability to be rentier. This chapter will explore the reasons why domestic consumption is increasing and all options that could replace the national income that oil provides. This chapter will conclude by examining other threats to maintaining rentierism in a post-oil-income economy.

Increasing Domestic Consumption

In 2009, Saudi Aramco's Vice President Ahmed Al Sa'adi announced at the Saudi Water and Power Forum that over the next 20 years, income from oil sales would

decrease by 50 percent. He attributed this initially shocking figure to the fact that a growing percentage of crude oil production is being used for Saudi domestic power, industry, and transport needs. His reasoning for divulging this daunting statistic was to warn those involved in Saudi Arabia's water and power sector that their uninhibited energy consumption ways would have to come to an end. Al Sa'adi informed the Forum that 83 percent of the water in Saudi Arabia goes towards agriculture. The rate at which Saudi Arabia converts oil to electricity is beyond inefficient, with one barrel of oil required to convert 630-kilowatt hours of energy. The United States operates at a level where only 61 percent of one barrel can produce the same amount of energy. He also claimed that energy consumption within the water sector is growing faster than the population and the economy. Energy scarcity creates the need for more water. Depleting oil fields require more water to pressurize the fields in order to extract the remaining amounts of oil. Biofuels need water for irrigation, which depletes aquifers, which then in turn requires more energy for pumping and desalinating. Increase in yearly desert temperatures also require more water in the form of energy in order to cool down power stations. It is inevitable that the water sector will require more and more energy and will be operating on a tighter and more expensive oil budget.[1]

The population in Saudi Arabia is 27 million. The Saudi Arabian government completely subsidizes water and electricity and maintains price controls for basic utilities, energy, and agricultural products that are often below the cost of production. Potable water, petroleum products, and feedstock for petrochemical industries are all provided at or below world prices. For nationals as well as expatriates and nonnationals, the government has maintained a cap of US$.67 cents per gallon of gasoline at the pump in

Saudi Arabia, which reflects the low cost of production as well as their willingness to practically give it away for free to people living in Saudi Arabia. The effect of these low prices on petroleum products and petrochemicals eliminates the need for any oil imports.[2] Saudi Arabia has the fastest growing rate of energy consumption in the world. Much of the energy consumption in Saudi Arabia goes to the operation of air conditioning units. Money spent using energy to keep cool in the oppressive summer heat takes away from the amount that could be spent on investing into the economy. Saudi Arabia just passed the United States as the worlds largest power consumers per capita. Instead of using petroleum for energy, they are in need of transferring to alternative resources for that function.[3]

Between the population explosion that is demanding an increase in oil barrels, and the wasted oil energy on desalination and air-conditioning, there are many barrels that will need to be replaced. The population growth in Saudi Arabia is the highest in the world. Between 1975-2009, the population of Saudi Arabia increased by 333 percent from 7 million to 25 million people.[4] Historically, the Kingdom encouraged the social policy of having as many children as a woman could, in order to grow the empire. This policy proved to be a burden on the government once the House of Saud took on the role of being rentier and chose to provide and subsidize all forms of social and economic benefits. The population explosion is one of the greatest challenges facing the Kingdom of Saudi Arabia. The country will, however, be forced to tackle this issue head on in order to maintain their rentierism for as long as possible.

Are Alternative Resources the Solution?

The need for alternative resources as a petroleum replacement has been part of a worldwide conversation since the early 1970s. Efforts have been made to expand on the discovery and utilization of alternative resources such as wind, solar, and coal as a replacement for oil energy, but none have come close to the cleanliness, ease of extraction, transportability, and low price that petroleum has provided. Hashim Yamani, President of King Abdullah City for Atomic and Renewable Energy, said that power consumption for industrial growth, transportation, and personal energy requirements is increasing at break-neck speeds. He fears that local consumption will seriously hamper the Kingdom's ability to meet international demand for oil and that a new energy mix must be on the forefront of Saudi budget considerations to meet local needs as well as to maintain the Saudi Arabian leadership role in the global energy market.[5] It is estimated that over the next 25 years, US$117 billion will be invested into the Saudi power sector via the King Abdullah City in Riyadh to increase power generation capacity. In the last four years, total local demand for oil has grown a total of 27 percent.[6] Not only is Saudi Arabia in need of a replacement for oil for energy, they are also in need of supplemental energy due to their population explosion. If Saudi Arabia can replace the amount of oil that it consumes domestically with a separate form of energy, it will have more barrels available for export and national profit. This sector will determine where Saudi Arabia stands on being able to replace their barrels with alternative energy and if they will be able to find an income replacement for oil.

Biofuels

Biofuels are renewable energy resources that are produced from biomass, usually ethanol bearing plants such as corn, sugarcane, and sweet beets.[7] Biodiesel is made from vegetable oil, which produces cellulosic ethanol made from wood-based biomass such as switchgrass, wood, and other nascent fuels like methanol.[8] Ethanol is a valuable alternative resource to oil because as a colorless liquid produced by the fermentation of sugar or starch, it can power internal combustion engines.[9] Ethanol was used prior to the discovery of oil, but oil was much easier and cheaper to convert to gasoline than it was to convert corn and other grains into the alcohol that could fuel the engines. The current process of fermenting corn and turning it into ethanol typically requires seven gallons of oil to produce only eight gallons of ethanol.[10] However, as technology advances, fewer and fewer gallons of oil will be required to produce ethanol and biomass could be a more economical approach to using renewable natural resources. Biomass and biofuels are truly renewable in the sense that they are produced from replenishable agricultural resources. Biofuels may be harvested as long as there are seeds to plant these products and water to nourish them.[11] Herein lies the problem with Saudi Arabia. Only 1.67 percent of the entire country is arable and as it is, the country must rely on massive technology intervention in order to drink potable water. The country lacks any permanent rivers or waterways, and the nearest water source lies in aquifers buried deep below the earth's surface.[12] The Middle East North Africa (MENA) region offers up to 45 percent of the world's total energy potential from all renewable resources that can generate three times the world's total power demands through biomass feedstock due to its geographic location, access to fresh water, and arable land.[13] However, even

genetically engineered microorganisms for the use in biocatalytics is impossible in Saudi Arabia because there is not enough arable land or water to nurture these organisms. Any type of biomass or biofuel initiative remains unfeasible for the Kingdom of Saudi Arabia in order to replace even a part of their depleting oil reserves. Not only is it impossible to replace their barrels with biomass and biofuels for domestic energy consumption, biofuels will not be able to aid in maintaining their rentierism because even if the country could grow and convert biomass, they could not produce enough in order to earn an income from export.

Wind

The most naturally renewable energy resources that are freely available are wind and solar. During the 1990s, wind energy capacity expanded at an annual rate of 25 percent with the cost of production declining steadily. According to the American Wind Energy Association (WEA) 80 percent of the world's installed wind energy farms are located in the United States, Germany, Denmark, Spain, and India. Wind conversion is one of the fastest growing options for renewable energy. The major challenges associated with wind energy is that wind is intermittent and it cannot be stored, unless batteries are used. Wind cannot always be harvested to meet the timing of energy demands and good wind sites are usually far from areas of electric power demands. Saudi Arabia's population is centered around large cities due to the government subsidies of land that were distributed in those areas and the ease of utilizing state issued benefits such as education and healthcare. Few people live outside of the massive city centers, but the city centers is where the demand for energy comes from. It is not feasible to put wind mills in

the middle of the cities; they must be located farther out into the desert, where transporting that energy is difficult and expensive if the use of batteries is needed.[14]

Solar

The study of solar energy began in 1977 in Saudi Arabia during the nationwide recognition of a need for an alternative to oil. The Energy Research Institute (ERI) at the King Abdul Aziz City for Science and Technology (KACST) was then formed as an international program partnered with the United States' SOLERAS and with the Federal Republic of Germany's HYSOLAR. These three countries have worked on projects to generate electricity, water desalination, an agricultural application to energy, as well as water-based hydro cooling systems. Saudi Arabia receives some of the most intense sunlight in the world. Every day, the Kingdom receives 105 trillion kilowatt hours of sunlight, the equivalent of 10 billion barrels of crude oil, in terms of energy usage.[15] Effective utilization of solar energy has not made reasonable progress in Saudi Arabia, however, because of several obstacles. The first and most severe obstacle to overcome is the current availability of oil. Oil in Saudi Arabia is the ultimate energy source and has historically been incredibly cheap to produce and to consume for Saudi nationals. The second obstacle has been the dust effect. The prevalence of frequent dust storms that blow through the country can decrease solar energy power by 10-20 percent. The third obstacle to implementing solar power into the Kingdom is the availability of government subsidies for oil and the unavailability of government subsidies for the research and funding of solar energy programs. Low and medium solar thermal energy applications are technically and economically feasible and are a possibility for oil energy replacement

in the future.[16] If programs are able to be fostered and expanded, solar energy has projected applications for use in water pumps, refrigerators, air conditioners, heaters, and communications equipment.[17] Unfortunately, while solar energy is a good replacement for energy within the county, it is unable to be exported, even regionally, and therefore is not a feasible replacement to the income of oil or as a means of maintaining rentierism.

Petrochemicals

Currently, the Saudi Arabian national government has an economic stake in petrochemical and chemical companies via the petrochemical joint ventures of Saudi Aramco. Petrochemicals are products derived from petroleum. Chemical compounds are also produced from petroleum and other fossil fuels such as coal and natural gas or renewable resources like corn or sugar cane. The two petrochemical classes are *olefins*, which include ethylene and propylene, and *aromatics*, which include benzene, toluene, and xylene isomers. The oil refineries that Saudi Aramco has built produce olefins and aromatics by fluid catalytics and cracking of petroleum fractions. Aromatics and olefins are the building blocks for a wide range of materials, such as solvents, detergents, adhesives, plastics, resins, fibers, lubricants, and gels. Saudi Aramco has been busy aligning investments with downstream oil strategies to become the leading petrochemical company in the world. The new Chemicals Organization of Aramco oversees the growing petrochemical portfolio and organizes the marketing, customer service, and product delivery. Since 2012, Saudi Aramco has integrated many of their oil refineries with petrochemical plants and are currently building new petrochemical facilities. In order to use the most out of every petroleum compound it extracts, Saudi Aramco has

also partnered with leading global petrochemical companies such as The Dow Chemical Company, Total, Chinese Petrochemical Corporation, and Sumitomo Chemical Company. The Kingdom's new company, Saudi Aramco Total Refining and Petrochemical Company (SATORP), is set to begin production in 2013 in Jubail alongside France's Total company to build a full conversion refinery. In partnership with the Chinese Petrochemical Corporation, Saudi Arabia is embarking on a joint venture located in Jujian, China to produce high-quality refined products and petrochemicals.[18] There are a host of other companies in Saudi Arabia that manufacture petrochemicals, but they are individually owned corporations, such as Basic Chemical Industries, Chemical Marketing and Distribution Company, Saudi Water Treatment Company, Basic Chemicals National Company, Arabian Polyol Company, and National Adhesives Unlimited.[19] Saudi Aramco is behind the curve on producing petrochemicals, but all is not lost. Petrochemicals are produced from petroleum compounds, and if production of petroleum is not increased, the government will have no choice but to limit the amount of petroleum that is allotted for the use in petrochemicals, and it will divert that amount to the export industry where the majority of their national income is derived. Petrochemicals, even if solely owned by the Saudi Government, is not a reasonable alternative to replace the income from lost oil. There are not enough products to do so, the products are produced from petroleum, which is nonrenewable, and there are many other companies in the private sector and in the world that are producing petrochemicals that already have substantial market share compared to the Saudi government.

Minerals and Mining

Iron ore, gold, copper, limestone, gypsum, silver, tin, tungsten, nickel, chrome, zinc, lead, potassium ore, phosphates, bauxite, marble, and clay are the main products in the Saudi Arabian mining and mineral economy. The Ministry of Petroleum and Mineral Resources in Saudi Arabia has identified that there are 1,270 sources of precious stones and 1,170 sources of other minerals, prompting them to continue issuing an increasing number of mining and exploration concessions. Steps by the Saudi government have encouraged more private sector involvement in the development of the mining sector. The government has issued incentives for investment by both foreign and domestic companies as well as government support services to facilitate the extraction of more minerals.[20]

The largest mineral and mining company is Ma'aden Saudi Arabian Mining Company. In 1997, a Royal decree was issued for the formation of a company that could facilitate the development of the mineral and mining industry. The company was originally wholly owned by the Saudi government and then in 2008, 50 percent of its shares were floated on the Saudi Stock Exchange, Tadawul. Initially, the activities of Ma'aden centered around the gold business, which now includes five mines and over 11 million ounces of compliant JORC gold, or Joint Ore Reserves Committee, which is the Australasian Code for Reporting of Exploration Results, or the universal standard for evaluating minerals. The means by which minerals are extracted, refined, and then transported requires massive amounts of national infrastructure cooperation. Railway lines 1,500 km in length run between the phosphate mine and bauxite mine on opposite ends of the country and the port in Ras al Khair was built to transport aluminum and

phosphates. Ma'aden has a power conversion agreement with Saline Water Conversion Company and Saudi Electricity Company, who are constructing their own power and desalination plant just for uses required by mining. Other infrastructure necessities include roadways, drainage, lighting, power grid connection, power transformation, distribution facilities, and government-owned mining concessions.[21] Because the main mining company is now only partially owned by the government, the Kingdom now has little say in how the company operates, and does not have access to profits like it would if it were still wholly owned by Saudi Arabia. While the mineral and mining industry is robust in Saudi Arabia, the infrastructure, extraction, and transportation process is too closely linked to the oil and water industries, which are experiencing their own problems. The mining industry will never be the income behemoth that oil is and therefore will not contribute to the replacement of oil income or the maintenance of rentierism in the Kingdom of Saudi Arabia.

Hydrogen

Hydrogen has been deemed the most promising replacement for oil because it is abundant, affordable, and is nonpolluting. Hydrogen is the most plentiful element in the world and its supply is limitless. Hydrogen is produced from coal, natural gas, and nuclear power. Hydrogen is not an energy source, itself; it is a carrier of energy that can be used to store, move, and deliver energy produced from other sources. Hydrogen fuel is produced in three ways: through thermal processing, electrolytic processing, and photolytic processing. Thermal processing for hydrogen involves the process of steam reforming, which through high-temperature processing, the steam reacts with the

hydrocarbon to produce hydrogen. Hydrocarbon fuels such as natural gas, diesel, renewable liquid fuels, and gasified coal can be produced from hydrogen. During the electrolytic process, water is separated into oxygen and hydrogen through a process called electrolysis. The photolytic process uses light as the agent for hydrogen production. Photobiological processes use the natural photosynthetic activity of bacteria and algae to produce hydrogen. The photoelectrochemical processes use specialized semiconductors to separate water into hydrogen and oxygen.[22] While hydrogen comes from free, associated materials, it is expensive to generate because it does not exist in a pure state in nature. The production of hydrogen fuels requires large amounts of fossil fuels, which are nonrenewable resources, which also includes water. Hydrogen fuel cannot be stored or transported through the existing oil infrastructure that includes petroleum service stations.[23] The fact that hydrogen is only found in depleting fossil fuels and water that is already hard to come by, as well as the fact that it is unable to be transported, makes hydrogen fuel another natural resource that will not prevent the death of rentierism in Saudi Arabia after maximum daily oil production meets daily consumption.

Natural Gas

In the early 1970s, when Saudi Arabia's oil production was beginning to soar, the associated gas that comes as a byproduct of oil became available. Prior to this, the country simply burned off the associated gas, until it realized that a need for an alternative to oil would be useful. In 1975 Saudi Arabia established the Master Gas System (MGS) and began to use the low cost byproduct as feedstock to create the

enormous petrochemical complex now called Saudi Basic Industries Corporation, or SABIC. The associated gas became a world-class petrochemical with uses in the manufacturing of steel, cement, and fertilizer as well as in the desalination of seawater. Liquid natural gas quickly became the primary fuel for generating reliable and affordable energy for use throughout Saudi Arabia. Once the Kingdom realized that liquid natural gas is the most important component in desalination for potable water for its burgeoning population and for electricity uses, SABIC engaged in ambitious exploration programs to find free, unassociated natural gas. The importance of liquid natural gas was realized and it was confirmed that if the country was going to depend on it for critical functions throughout the state, the supply of it could not be subject to the fluctuating production and demand of domestic and global oil markets. Natural liquid gas had to be found on its own. The country now could no longer simply rely on associated gas.[24] Saudi Arabia transformed itself over the last 50 years into being the fourth largest holder of natural gas in the world, with 279 trillion standard cubic feet worth of gas. The entire country adopted gas as their primary means for electricity and other forms of energy. This is not to say, however, that they are not also consuming large quantities of petroleum as well. As shown, demand for petroleum is calculated to be about 25 barrels, or 1050 gallons of petroleum per person, per year. Saudi Arabia has the fastest growing consumption rate at 4 percent per year.[25]

While natural and associated gas is a useful commodity for the local population, it still does not replace oil. Gas in Saudi Arabia is purely for domestic consumption. Gas is not an exportable resource, even though Saudi Aramco has stated that their new priority is to increase gas exploration as well as production. Gas production powers the

industries in the Kingdom of Saudi Arabia and it is the main source of feedstock for domestic petrochemical companies.[26] One-third of gas in Saudi Arabia is used to generate electricity, 20 percent is used in the desalination of seawater, 25 percent is used in the petrochemical and industrial complexes, and the remainder is used in the operation of the oil-refining sector. The oil challenge is more of a monetary threat to the kingdom, while the challenge for discovering and harvesting new gas reserves is a threat to filling basic living and social needs. The oil and gas challenges go hand in hand, however, because operating the desalination plants in Saudi Arabia costs US$2 billion per year to operate. A full 70 percent of potable water in Saudi Arabia comes from the desalination plants, since the country does not have any rivers, streams, or lakes full of fresh water. It can be assumed that the desalination industry will require another US$40 billion to increase discovery, harvesting, and transportation of natural gas just within the country to meet domestic demand. Base production cost for production and delivery of natural gas costs about US$1.10 per cubic meter, but is partially subsidized to Saudi nationals and is sold to them at only 30 percent of this cost. Unless the government plans to increase the price per cubic meter of natural gas that each citizen must pay, they will be responsible for the increasing cost that will result from supply and demand when natural gas production cannot keep up with demand for potable water and electricity that the exploding population will need for day to day sustainment of life. While increasing the discovery and production of gas for domestic purposes is forward thinking and necessary, it will not help maintain rentierism because it does not generate any foreign rents to the government of Saudi Arabia to distribute throughout the population.

Nuclear Power

Splitting atoms, a dangerous yet efficient form of electricity, generates nuclear power. Nuclear power is the most cost and production efficient form of energy and it is the most nonpolluting form in the world. The United States is the leader in nuclear power production, generating more than 25 percent of the world's capacity. Nuclear power provides more than half of the electricity to countries in Europe and the main current growth markets are in China, other parts of Asia, and India.[27] Uranium and plutonium compose the basis of nuclear fuels. In the 1950s, there were concerns that because uranium and plutonium were so energy dense and abundant, nuclear power would be so cheap that it would replace all other forms of energy and destabilize the rest of the energy market. It was soon discovered that the mining and enrichment of uranium and the disposal of nuclear wastes would be a huge problem. By ignoring the cost of mining, purification, processing, and waste disposal, nuclear energy could be delivered for a cost of 1-2 cents per kilowatt-hour. At full price, however, nuclear energy is the most expensive source of electricity.[28] The cost of producing nuclear energy is expensive at US$10 billion for a new power plant, but still not cost prohibitive. The danger associated with it is, in some cases is prohibitive. For example, Iran is a nation that has endured sanctions and international skeptical precaution regarding their nuclear power plant. Iran launched their nuclear program in the 1950s with help from the United States as part of the Atoms for Peace program. Western participation continued until the 1979 Iranian Revolution when Iran temporarily disbanded the program. Iran's nuclear program has included multiple research sites, two uranium mines, a research reactor, and uranium processing facilities. Iran sought assistance for their renewed program and with

help from the Russian government, the first Iranian nuclear power plant opened on 12 September 2011. In November 2011, The International Atomic Energy Agency (IAEA) released a report detailing the research and experiments geared toward the development of a nuclear weapon. The report examined the country's detonator development, the multipoint initiation of high explosives, and nuclear payload integration into a missile delivery vehicle.[29]

The announcement was not without controversy, with former Saudi ambassador to the United States Turki al-Faisal warning that a regional nuclear arms race could start if Iran does not curb its nuclear efforts. He furthered those sentiments by claiming that if Iran does develop a nuclear weapon, it would leave Saudi Arabia no choice but to also develop one and to pursue policies that would lead to "dramatic consequences."[30] Although al-Faisal does not speak in an official capacity, he is believed to be the next foreign minister of the Kingdom of Saudi Arabia.[31]

Nuclear power is as controversial as it is dangerous. In April 2011, Saudi Arabia announced that they would be building up the King Abdullah City for Atomic and Renewable Energy (KA-CARE) to pursue their nuclear power objectives of building 16 nuclear reactors in the next 20 years at an estimated cost of US$7 billion each. These reactors would ideally give the Kingdom the ability to become a regional exporter of electricity and would provide one-fifth of the country's electricity for industrial and residential use, as well as for the desalination of seawater. The program would ensure continued supplies of potable drinking water as well as electricity to the growing population. Along with the announcement that the country was planning on building these reactor sites, the government also announced that it would be funding a housing and

training center in order to educate domestic workers so they will be able to work at these nuclear sites. The spending of their sovereign wealth fund will mainly be focused on local employment and domestic energy needs.[32]

Executing the plan to build 16 nuclear reactors, mainly along the Red Sea and the Persian Gulf coastlines, will require help from many countries around the world. On 13 January 2012, China signed an agreement with Saudi Arabia for increased cooperation and development of nuclear power plants and research reactors and the manufacturing and supply of nuclear fuel elements. The agreement was the fourth nuclear agreement signed by Saudi Arabia following similar agreements with France, Argentina, and South Korea. The Kingdom has also been in talks with the United States, the United Kingdom, as well as Russia and the Czech Republic.[33] So far, there has not been an agreement under Section 123 of the Atomic Energy Act that would allow firms in the United States to sell nuclear technology to the Kingdom of Saudi Arabia. The United States Congress has voiced opinions that Saudi Arabia is an unstable country in an unstable region. According to Mark Hibbs, a nuclear energy analyst with the Carnegie Endowment for International Peace, claims that Saudi Arabia has only a limited nuclear engineering workforce and lacks enrichment and related fuel-cycle facilities. If the United States fails to come to an agreement about exporting nuclear reactor technologies to Saudi Arabia, the Kingdom's ability to do business with other countries could be in jeopardy as well.[34] If Saudi Arabia can come to an agreement with the United States or can retrieve enough essential materials from other countries to build and operate their nuclear facilities, there is a good possibility that they would be able to meet the growing domestic energy needs as well as replace income from oil.[35]

In 2010, AREVA, the main French multinational industrial and nuclear energy conglomerate, realized US$11.9 billion in sales revenues. The French government does not own AREVA; instead the government is their largest customer. If Saudi Arabia chooses to export nuclear energy instead of solely subsidizing it for the national population, nuclear energy could very well replace a large amount of lost oil income. With international disagreement and skepticism about Saudi Arabia obtaining the materials to be able to produce nuclear energy, Saudi Arabia may find many obstacles to becoming a nuclear power exporting country. Actually getting online, educating the right people, and turning nuclear energy into a profitable government business is many years down the road, and may be an endeavor they will never realize.

This chapter has shown that there are no natural resources currently available to Saudi Arabia that can replace the income from oil. The best strategy for the Kingdom is to invest into the implementation of all forms of natural resources that could replace oil for domestic consumption needs. Saudi Aramco's programs to expand unassociated natural gas discovery and extraction are the most feasible solution to replacing part of the barrel for water desalination and air conditioning needs. Solar, wind, and biofuels are not plausible on the scale that Saudi Arabia needs them to be. The government has proven unwilling to fund exploratory ventures in these areas and the logistics getting those resources to the population is too complex. Saudi Arabia is an ideal location for nuclear power plants because of the vast expanses of desert that are uninhabited. The obstacles to begin producing energy from nuclear plants are proving to be prohibitive for the Kingdom. While Saudi Arabia may have the funding to begin a project of that size, geopolitics is preventing them from obtaining the necessary equipment. Regional

political pressures are prompting the government of Saudi Arabia to seek resources to begin production, but global political pressure from the West is preventing it. The best case scenario for Saudi Arabia is to continue to replace domestic oil demand with other domestic alternative resources and to make every effort to educate the population on energy conservation and population control.

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THE ECONOMIC LANDSCAPE IN SAUDI ARABIA

According to the Saudi Arabian Monetary Agency (SAMA) and their Forty-Seventh Annual Report, which was completed in December 2011, actual government revenues for the Kingdom of Saudi Arabia for the year 2010 amounted to US$197.7 billion. Actual government expenditures equaled US$174.3 billion, resulting in a budget surplus of US$23 billion[1]. The report attributes the surplus to the global economic recovery and the increase in global oil prices. Oil prices of Arabian Light rose by 26.7 percent from 2009 to 2010 and the price per barrel at the end of 2010 was US$77.75. Broad money, or short duration deposits and short-term securities that are less liquid than currency or demand deposit,[2] increased by 5 percent from 2009 to reach its highest level of US$288 billion by the end of 2012. Broad money is used by central banks to forecast inflation because it measures the domestic money supply of the country. By the end of the first quarter of 2012, broad money had increased again by 3.8 percent from the previous quarter,[3] indicating that domestic money had not being domestically or internationally invested and was sitting idle in Saudi Arabian banks. Oil revenue in 2010 constituted 90.3 percent of total revenue for the country. Current expenditure accounted for 70 percent while capital expenditure constituted 30 percent of total expenditure.[4] For a country whose goal of implementing eight previous development plans in order to diversify the economy, spending 30 percent on capital expenditures is a low percentage. Capital expenditures are used to create future benefits for the domestic economy. The

United States, which is an economically developed country, continues to invest upwards of 60-70 percent of total expenditures on capital expenditures and investments.[5]

Challenges to the Saudi Arabian Economy

In the Forty-Seventh Annual Report issued by the Saudi Arabian Monetary Agency in 2011, the Agency cited the seven most important challenges to the Saudi Arabian economy on pages 228-230 of the report. The following section will outline what the Saudi Arabian Monetary Agency believes to be the issues that will be the most challenging for the government in the preparation for an economy that is no longer rentier.

1. Population Growth
    - The Central Department of Statistics and Information (CDSI) indicate that the population in the Kingdom is growing at an annual average of 2.5 percent. This growth rate increases pressure on housing, health, education, water, electricity, communications, transport, and municipal services. The study also found that the national labor force is increasing by an average of 4.2 percent per year. With the large number of new job seekers entering the market, there is a dearth of employment available through the government as well as through the private sector. Competition for employment with foreign workers coupled with an increasingly large young labor force has created one of the most challenging aspects to the Saudi Arabian economy.

2. Water Supply and Pressure on its Resources
    - Projections from the Ministry of Water and Electricity and from the Ministry of Economy and Planning show that the demand for water for municipal purposes is increasing by 2.1 percent per year. The demand for water for industrial purposes is expected to rise by 5.5 percent annually. The water for agricultural purposes will decline 3.7 percent over the next year due to efforts made by the government in adherence to the Ninth Development Plan's efforts to rationalize water for agricultural consumption. The development of water resources is one of the top development requirements in the Kingdom and will require increased budget revenues in order to continue to provide water to the population at the increasing rate of demand.
3. Increasing Demand for Basic Services Due to Accelerated Population Growth
    - Demand for water, electricity, communications, transport, and other utilities is expected to increase in line with the population growth. According to the Population and Housing Census in 2010, the population of the Kingdom stood at 27.14 million and according to the projections of the Ninth Development Plan will reach 33.11 million residents in 2024. Providing basic utilities will be a challenge if the increase in population is not coped with in equal amounts to its basic services growth rates.

4. Growing Economic Globalization Phenomenon

    - There is currently an increased integration and interdependence of the global economy's segments and activities, which has resulted in an expanded system of trade under the umbrella of the world trade system. This has triggered strong competitiveness for domestic products and investments, requiring the preparation of the domestic Saudi Arabian market for competition and attraction of investments and technology necessary for the development of various economic sectors. Saudi Arabia has had the reputation of not being a friendly investment climate for international investors due to the religious and cultural restrictions on certain types of business activity. The government of the Kingdom of Saudi Arabia will have to recognize that obstacle and implement a more friendly international investment and business atmosphere in order to keep up with the globalization phenomenon.

5. Necessity for Diversification of Government Revenue Sources

    - The state budget of Saudi Arabia is currently experiencing a surplus. In order to avoid future swings of oil prices and revenues, it is advisable to diversify public revenue sources and expand the nonoil revenue base. From this reality emerges the importance of expanding and stimulating the private sector's roles and encouraging it to invest in the infrastructure sector and to manage it on a commercial basis.

6. Facing the Banking and Financial Sector Challenges Under the WTO Laws
    - The interdependence of economic interests of all countries on a global scale has created challenges for the Kingdom. A continued liberation of financial services for the Kingdom is needed and an expanded application of the policies for the liberation of trade, economic openness, economic freedom, and economic globalization continually needs to be implemented. International standards of supervision and control over the banking sector is also advised. The First Development Plan in Saudi Arabia outlined a strong and transparent banking model that has been used for the last 40 years to allow Saudi Arabia to abide by international banking standards. Work still needs to be done, however, to continue to meet ever-changing international banking standards.
7. International Trade
    - There is a significant challenge for Saudi Arabia from the strong competition faced by national products in the domestic and international markets, especially regarding the ascension of Saudi Arabia into the World Trade Organization (WTO). This ascension has required the adoption of the best production methods to ensure the reduction of production cost and the improvement of the Saudi Arabian product quality in order to gain access to more international markets. To continue at a competitive level, there needs to be continued establishment and expansion of economic and regional conglomerates and free trade zones,

> accelerating the process of transforming the national economy into a knowledge economy in order to enhance competitiveness. The growing development of sciences and technologies is necessary for reaping economic and commercial benefits and to increase the competition of Saudi Arabian commodities and services.

While it would appear that the Saudi Arabian Monetary Agency has covered all of the main economic challenges posed to the Kingdom's government, the report is lacking two distinct details in the analysis. The Report outlines the most pressing concerns and challenges and discusses the goals of the Ninth Development Plan but nowhere to be found is a timeline for completion. The government is aware of what the problems are and will be in the future, but at no point in the Report or in other plans or documents do they specifically outline a plan of action for each point. The government has been creating and going through the motions of Development Plans since 1970, but they appear to be surface plans, lacking details and implementation strategies. The section in this chapter that discusses what has been done by the government in regards to privatization is a step in the right direction, but the results are not overwhelmingly positive or impressive.

The second important point that is lacking from the Report is that they are not addressing the decreasing amount of revenue from oil. According to the research in this paper, domestic consumption will equal domestic production in the year 2022. That is a mere 10 years from when this research was conducted. Granted, the Kingdom of Saudi Arabia will still have enormous excess capacity of oil, but as this research has shown, they do not and most likely will not have the technology, means, or capability of

increasing daily domestic production to levels that will provide for the rapidly expanding population and to export barrels for continued profit. The concept of ceasing to be rentier, of being able to provide its citizens with the basic services and essentials and subsidized goods that they have come to enjoy has not come to the Saudi Arabian conscience yet. While the government and the Monetary Agency is able to have foresight in the economic condition if government revenue stays the same, they are not actively planning and implementing to the degree that they need to accurately prepare for the death of rentierism.

Employment

The Kingdom of Saudi Arabia has been an oil-dependent economy since the first tanker of oil was exported in 1938. The country possesses one-fifth of the world's proven oil reserves and is the largest exporter of oil in the world. Saudi Arabia's annual GDP equals US$676 billion with an annual GDP growth rate of 6.5 percent. Per capita income stands at a meager US$24,000 compared to its neighbor Kuwait, who earns nearly US$50,000 GDP per capita. Petroleum accounts for 80 percent of budget revenues, 45 percent of GDP, and 90 percent of export earnings and US$210 billion is invested back into the country,[6] yet among developing nations, Saudi Arabia ranks 32nd out of 103 nations on the Human Poverty Index, which is a global assessment of the standard of living. This puts the Kingdom above most of its Middle East neighbors, but it does not negate the fact that unemployment continues to rise and the standard of living is continually falling.[7] Unemployment has reached a staggering 28.2 percent of the

population, of which 23 percent of males are unemployed and 46 percent of females are unemployed.

Employment in Saudi Arabia is broken into three categories: agriculture, industry, and service. Agriculture employs 6.7 percent of the current workforce, industry employs 21.4 percent, and the service sector employs 71.9 percent of the current workforce. Of the Saudi workforce, 80 percent are nonnational. It is not a secret, however, that the young Saudi nationals are uneducated and lack the technical skills that are required by the private sector. As noted previously, there are free public schools in the country, but they are based around a Wahhabi curriculum. While educating the youth of the country on Islam, the government is doing them an injustice by not teaching them the fundamental skills needed to perform the necessary service and industry functions that would provide them with employment. Reengineering the education system in the country will take years, so in the meantime, the government has found the solution in an expatriate workforce.[8]

Every year, more than 100,000 foreign workers enter Saudi Arabia to perform menial jobs as well as technical jobs. The work ethic of the Saudi Arabian population is one of the worst in the world because they have lived in a rentier economy and developed a rentier mentality for their entire life. Over 5.6 million foreign and expatriate workers command most of the jobs in the country where the main industry for government income only employs 1.5 percent of the population, which leaves very few jobs for Saudi nationals. Of the jobs that are available, business owners have complained that the selection of Saudi national candidates are not properly educated or prepared for workforce requirements. Students who do attend university study their limited field of

choice with Islamic education but not how to run a business, read a balance sheet, or write a business proposal. When the national income is reduced due to a lack of income from oil exports, the government will cease to be rentier and will cease to provide the subsidies on which the population has come to rely. If the population does not start securing employment now, when government subsidies decrease, the country will be in for an economic shock.[9]

Not only is Saudi Arabia experiencing an employment crisis, they are also starting to feel the drain on the economy from the expatriate workforce. Remittances from foreign workers total US$27 billion per year.[10] The private sector can discriminate in the hiring process based on knowledge and skill set and more often than not, the foreign worker is more qualified than the Saudi national. The government does not have enough job openings to be able to provide guaranteed employment for every national, like Kuwait can.[11] While the foreign expatriate workforce is not legally obligated to receive benefits and subsidies from the government, they do so vicariously. The expatriate workforce uses the same infrastructure, healthcare facilities, schools, they drink the same desalinated water, they consume cheap petroleum, and they also procreate, adding to the population explosion. King Fahd had the right idea to bring in foreign workers to help with the building up of Saudi Arabia, but now foreign workers have become an economic hardship and burden to the population and government of Saudi Arabia.

Agriculture

The economy outside of oil extraction, production, and exportation is severely limited. Arable land in Saudi Arabia is only 1.67 percent of the entire country. The

country experiences *desertification,* or the depletion of underground water resources and the lack of perennial rivers or permanent bodies of water. This phenomenon has prompted the development of extensive desalination of seawater facilities. Because of the desertification and the 100 plus degree temperatures throughout the country for much of the year, agriculture as an industry remains challenging.[12] The few agricultural products that Saudi Arabia does produce include wheat, barley, tomatoes, watermelons, dates, and sorghum. These products are used domestically and are not generated in a large enough quantity to export. Agriculture does account for 4 percent of the GDP and Saudi Arabia is self sufficient in the production of most dairy products, including milk and eggs.[13]

Industry

While not wealthy in agricultural surplus, Saudi Arabia was lucky enough to be endowed with a few natural resources, which include petroleum, natural gas, iron ore, gold, and copper.[14] The key sectors of Saudi Arabian industry include crude oil production, petroleum refining, commercial ship and aircraft repair, and the production of basic petrochemicals, ammonia, industrialized gases, sodium hydroxide, cement, fertilizers, plastics, and metals. The industry that employs the fewest people to the amount of income it generates is the extraction, production, and exportation of natural resources. The oil industry only employs 1.5 percent of the working population but generates 80 percent of the states revenues. Saudi Arabia has the fourth largest deposit of natural gas in the world, representing 4 percent of the worlds total natural gas reserves. The manufacturing industry contributes 9 percent to the GDP and employs 8 percent of

the Saudi workforce. Most manufacturing jobs in Saudi Arabia revolve around the minerals sector. Refining petroleum is the most lucrative activity, with the manufacturing of fertilizer, steel, and cement a close second.[15] Cement is in such high demand for the building of the US$400 billion infrastructure projects that are currently underway that the government has imposed a cement export ban. Prices for cement soared in 2008 when Saudi Arabia faced a cement shortage due to cement companies exporting large quantities of cement for higher profits. The ban has helped stabilize prices and has guaranteed the availability of cement for the 500,000 new homes in construction and other current infrastructure projects.[16]

Services

The service sector of the Saudi Arabian economy continues to boom. The service sector produces 35 percent of the GDP and employs 73 percent of the population. Of the entire service sector, 16 percent work in retail, 12 percent in education, and 10 percent in domestic service.[17] One very important aspect of the service sector is the tourism industry. Saudi Arabia is the birthplace of Islam and home to the two holiest shrines in the Muslim world with the official name of the King being the 'Custodian of the Two Holy Mosques.' Being that the Kingdom is at the center of Islamic tradition, Saudi Arabia is privileged with housing all Hajj tourists that want to visit the holy sites as well as the tourists who perform the *omra*, or minor pilgrimage outside of the Hajj period. In 2010, 13 million tourists visited Saudi Arabia and by 2014, the number is expected to be 15.8 million. The hospitality and service sector will also grow by increasing the number of hotel rooms by 381,000 in the next three years. Tourism accounts for 3.6 percent of

GDP with half of the inbound travelers going to Mecca and Medina. The Kingdom issued 9.5 million travel visas in 2011, which included the 2 million foreign pilgrims that performed Hajj. In addition to the foreign tourists coming for Hajj, 500,000 Saudi Arabians participate as well.[18]

Avoiding Dutch Disease

The economic theory of Dutch Disease of W. Max Corden and J. Peter Neary in 1982 to describe the devastating economic effects resulting from the discovery of oil in the Netherlands in 1962 would seem to apply to Saudi Arabia, but after analysis it does not. The theory of Dutch Disease states that the inflow of capital, resulting from an oil boom, causes the real exchange rate to appreciate. The reason for the appreciation is that the domestic prices in the tradable and nontradable sector are affected asymmetrically with the prices of the nontradable sector rising at a faster rate.[19] The result of this inflation is usually a decline in the manufacturing and agricultural sectors because with the increase in the value of the domestic currency, the domestic goods can no longer compete in the international market. In Saudi Arabia when the first oil boom hit in 1973, the real exchange rate was 151. It peaked at 270 in 1976 and then continued to decline until it was 100 in 1994. The first half of the 1970s was characterized by high inflation, upwards of 35 percent in 1975. During the 1980s, inflation fluctuated between 5 percent and -5 percent.[20] As this paper has shown, Saudi Arabia was a land of Bedouin tribesmen engaging in merchant trade and minimal agriculture until King Abdul Aziz conquered Arabia, made a state out of the land, and subsequently granted oil concessions. Manufacturing was all but nonexistent in the early 1900s and it was not until the country

began earning revenues from oil that they were able to invest in and grow their manufacturing industry. According to Dutch Disease theory, when an oil boom hits, the manufacturing sector decreases, but not in Saudi Arabia. The oil boom provided the means to expand on the manufacturing effort. The economic Development Plans began in 1970 in order to develop the country and the economy, and the manufacturing, as well as the agriculture sectors, were two of the most important projects. King Faisal had the foresight to realize that the country would need to diversify its economy and investing in manufacturing and agriculture was one of those ways.[21] Countries suffering from Dutch Disease usually experience a shift in labor force movement from the agricultural sector to the sector of nontradables or into the booming oil sector. In 1979, the Ministry of Planning in Saudi Arabia estimated that the total labor force to be 2.9 million. Agriculture accounted for 15.9 percent of the total work force. By 1989 however, the total labor force had risen to 5.8 million, but the share working in agriculture dropped to 9.9 percent. Despite the decrease in employment in the agricultural sector, agricultural output increased, again defying Dutch Disease.[22] Initially, Saudi Arabia appears to have had the recipe for contracting Dutch Disease. Being the world's largest oil producer would have had a negative effect on the rest of the economy, according to the Dutch Disease theory. Saudi Arabia was able to avoid the Disease because as soon as the government issued the first oil concessions, they began development efforts, which occurred before the first major oil boom.[23] The fact that the country was a merchant economy without modern infrastructure and that as soon as oil was discovered they started developing are the reasons that Saudi Arabia has never suffered from Dutch Disease.

This chapter examined the current economic situation in the Kingdom of Saudi Arabia and discussed the challenges that the economy is facing in light of a decrease in profit from oil exports and the subsequent death of rentierism. The employment sector was analyzed illustrating that there is a tremendously large expatriate work force and a small and restive national work force. The following chapter will examine what economic and political actions that the Kingdom is taking in order to secure a stable economic future for the country without rendering the country bankrupt upon the death of rentierism.

Notes

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PREPARATION FOR THE END OF RENTIERISM

This paper has shown that the welfare and standard of living of every Saudi Arabian national, expatriate, foreign worker, and every member of the House of Saud will be in jeopardy when the government is no longer able to produce enough barrels of oil for export profit. The Kingdom of Saudi Arabia is quickly approaching a dramatic turning point in their existence if they do not act quickly to replace the income that they enjoy from oil. Since 1970, the country has formulated nine development plans in an attempt to diversify the economy, to find renewable resources, to explore for minerals, and even to build entire economic cities. So far, most of these plans have not been reached and the ones that have, have not changed the economic, social, and political landscape enough to prevent the impending domestic oil shock.

In order to prepare for the end of a rentier state, the country of Saudi Arabia has claimed to implement economic diversification techniques and programs that would generate government revenue from sources other than oil. Development plans have also included goals of privatization and of facilitating an economic environment open to domestic entrepreneurialism. Once the government ceases to generate revenue from oil, the options for funding social benefits will be severely limited. With government revenue limited to income from taxation, import duties, and Hajj tariffs, Saudi Arabian nationals will be obligated to pay full price for education, healthcare, energy, and other social benefits that they currently enjoy.

There are many sectors of the country that are failing the people. There are many reasons why the government does not behave the way that the population would like it to. There are many steps that the Kingdom of Saudi Arabia is failing to take in order to prepare for the impending death of rentierism in their country. The main impediment to the economic and political actions required for that preparation, however, is the conflict between the state and the religion. Members of the Royal Family are savvy businessmen and politicians. The lack of preparedness for the end of rentierism is not attributable to a lack of business acumen or a desire by the Royal Family to watch their eponymous country return to a country that is reliant on merchant trade. The lack of preparedness is, however, attributable to the conflict between the Royal Family, who do understand business and politics, and the religious elite, who do not understand business or politics. The religious elite would like to see the country return to the time before modernization, Western influence, and in their view, the degradation of society.

This chapter will discuss the actions taken towards preparing for the end of a rentier state in Saudi Arabia. This chapter will also discuss the obstacles that are preventing certain factions of the country from adequately preparing for the end of rentierism. The relationships among those that live in Saudi Arabia are based on an established triangular set of linkages that include the House of Saud, the religious elite, and the greater Saudi Arabian society. The legitimacy of the Al Saud family comes from the support they receive from the religious establishment. Islam is maintained as the ultimate law of the land and Shariah is upheld by the Royal Family, which satisfies the needs of the religious elite. The Saudi society is provided for by the Royal Family in return for their allegiance and political quiescence. Many of the obstacles to

preparedness for the end of rentierism originates from the conflicts between these three segments of society. King Abdullah and other reformers have begun to advance the country in the economic and political realms, but through great struggle. The never-ending dissent among the differing groups in Saudi Arabia has all but paralyzed the country from diversifying, privatizing, preventing, and ultimately preparing for an economy that will no longer be able to provide for its citizens, for the ruling family, or for the religious establishment, as it has been for the last two generations of Saudi nationals.

Diversification

Ninth Development Plan

In the Ninth Development Plan, which began in 2010, the prioritized goal of the Council and Ministers was to develop and diversify income sources and to achieve optimum utilization of available economic resources to accomplish their goal of diversification. The six objectives of the Ninth Development Plan are as follows:

1. Increasing the standard of living and improving the quality of life for citizens
2. Achieving balance between population growth and natural resources
3. Rationalizing immigration to major urban areas in all regions of the Kingdom
4. Reducing the ratio of expatriates in the population structure
5. Reducing mortality rates of infants, children below 5 years, and maternity
6. Increasing the opportunities to make use of human resources, especially faculties and qualifications of the youth[1]

All Development Plans since 1970 that have been unveiled to the public have all

offered the same 5-year time line for implementation. They also have all had sweeping and grandiose ideas for what they want to happen in the economic and development sectors, but specific details for implementation have consistently been lacking. Above are the six stated goals of the Ninth Development Plan. Missing with those six goals are specific allocative funding, a Minister who is accountable to oversee the goals, and specific actions that are needed to achieve the goals. An example of this missing information is with the second goal of 'achieving balance between population growth and natural resources.' Lacking in the Ninth Development Plan report are the statistics for population growth rates, live birth and death rates, information about contraceptives, and the number of expatriates that are emigrating to the country and how many children they produce when they are there.[2] These are essential statistics in order to have a baseline of what even needs to be changed. Also lacking is information on natural resources. The report does not indicate what natural resources are being used, how much is being used, and who is using them. In order to 'balance population growth with natural resources,' it would behoove the government to know what their target goal of 'balance' would be and the exact steps needs to achieve that goal.

As discussed in this thesis, there are a variety of contributing factors as to why there is a paralysis of development and preparation for the end of rentierism. The stated goal of balancing population growth with natural resources is the key to preparing for the end of rentierism. At the helm of the decision making is King Abdullah, who is progressive in nature and who has implemented a myriad of development initiatives to diversify the economy, such as expanding the capacity of the international airport and all tourism-related necessities related to Hajj. Fighting him and his progressiveness is the

ulema, who even if they were aware of the population growth statistics would not adhere to a concerted effort at promoting birth control, because it goes against their religious values. Aside from the two dissenting decision makers are the Ministers who would ideally be in charge of ensuring that the stated goals are met. As discussed previously in this paper, there is no accountability or checks and balances in the country to verify that the goals are being met. Development goals are run ad hoc and then analyzed after five years to see if anything has changed. Dissention, lack of accountability, and poor management skills at the government level are the main reasons why these development goals are not being met and why Saudi Arabia will ultimately find themselves unprepared for the end of rentierism.

Privatization

The Saudi Arabian Monetary Agency cites 13 achievements during 2010 that illustrate the restructuring of the economy and the privatization process. The following list is a paired down version of all of the individual achievements, which are detailed on pages 27-38 of the report, but is a good indicator of what the Saudi Arabian government views as positive strides they have taken to privatize and diversify.

1. Regulatory Developments in the Saudi Economy in 2010
    - Regulation of electricity and cogeneration services in the industrial cities
    - Approval of steps for addressing the phenomenon of bounced checks
    - Abolition of the requirement of owning land when applying for a loan from the Real Estate Development Fund

2. Contributions of the Public Investment Fund (PIF)
    - Approval of the sale of state's shares in bilateral companies to the private sector
    - Studying the feasibility of selling the states' shares in national joint-stock companies
    - Approval of establishing a joint-stock company fully owned by the PIF for the purpose of owning government hotels
3. Saudi Railways Organization (SRO)
    - Development of the railway transport sector to achieve a partnership with the private sector
    - Comprehensive maintenance of the railway network
    - Protecting the railways from sand encroachment with private companies
4. Water and Sewage
    - Establishing the National Water Company (NWC)
    - Signing partnership contracts with the private sector to manage, maintain, and operate the water and sewage sector
    - Privatizing the sewage plants
5. Saudi Port Authority
    - 27 investment opportunities became available to the private sector
    - Renting out the central cargo terminals marine facilities to the private sector

- Developments at the ports to increase efficiency

6. Saudi Arabian Airlines
   - Completing privatization steps of Saudi Arabian Airlines
   - Converting minor sectors into strategic business units
   - Development of a marketing program to attract private investors
7. Department of Zakat and Taxation
   - Application of a new tax system--increase ease of paying taxes
   - Implement electronic archiving
   - Implement new automated tax system in Jeddah, Mecca, and Ta'if
8. The Saudi Electric Company
   - The Shuabiah Project III for water and electricity became the first cogeneration project in partnership with the private sector
   - Assigned main areas of activity: generations, transferring and distribution to subsidiaries owned by the Saudi Electric Company to a holding company
   - Registered the power transfer company with the Ministry of Commerce and Industry
9. Electricity and Cogeneration Regulatory Authority (ECRA)
   - ECRA created as an independent government agency to reform the electricity sector and restructure it to allow greater private sector participation
   - Creation of new investment opportunities, including coproductions, building, leasing, operating transfer lines, renting and operating existing

facilities, and purchasing existing power generation and water desalination facilities

10. Saline Water Conversion Corporation (SWCC)
    - Approval by the Supreme Royal Court to privatize the SWCC and converting into a holding joint-stock company fully owned by the Kingdom
    - The subsidiary production companies will be offered to the private sector for development with private sector participation to be no less than 60 percent of ownership
    - At a later date, the shares of the holding joint-stock company will be offered for initial public offering
11. Privatization of Education Services
    - To reduce financial cost and improve quality level, the Supreme Royal Court approves the Ministry of Education's request for expanding participation in the education sector to the private sector
    - Approval for development of school infrastructure with expansion of school transportation and in-school catering
    - Expansion of nursery and kindergarten programs
12. General Authority of Civil Aviation (GACA)
    - Entrusted the private sector with the management of several projects such as the development of a pilgrim terminal compound at King Abdulaziz International Airport
    - Allowing the private sector to establish and operate a water desalination plant at King Abdulaziz International Airport

- Building duty free markets in King Abdulaziz International Airport

13. Economic Cities Authority (ECA)
    - A Royal Decree was issued to establish the Economic Cities Authority (ECA) and the abolition of the Economic Cities Agency
    - ECA was entrusted with full supervision of the development of the economic cities
    - ECA expected to increase domestic, joint ventures, and foreign investments to make the economic cities the most competitive environment for attracting investment worldwide

Sovereign Wealth Funds and International Investment

Prior to 2008, the Saudi Arabian government deposited oil and other state-earned revenue into the central bank of Saudi Arabia, The Saudi Arabian Monetary Authority, and also into the coffers of the Royal Family. In 2008, Saudi Arabia confirmed its intentions to establish a formal external investment vehicle in the form of a sovereign wealth fund. The Kingdom was lenient to invest into a formal international fund due to its resource constraints prior to the rise of oil prices in 2003 and due to the potential criticism from both domestic and international actors for investing in the West. The move to invest internationally in a formal investment fund was the result of positive budget surpluses and an effort by the Saudi Arabian government to develop and modernize its financial services sector.[3]

When The Public Investment Fund was established in 2008, Mansour al-Maiman, the secretary-general of the Pubic Investment Fund, an arm of the Ministry of Finance,

began the fund with US$5.3 billion worth of capital. The Public Investment Fund previously had only the mandate to only invest domestically. Al-Maiman claimed at the time that his intentions were to build a diversified portfolio of investments that would maximize long-term rates of return and also to build up the national asset management skill base. Initially, the Public Investment Fund owned 100 percent of the investments but the sovereign wealth fund would have its own management team.[4]

Throughout 2008, Saudi Arabia became a major player in global capital markets through the Saudi Arabian Monetary Authority and the Public Investment Fund. By 2009, the Saudi Arabian government expanded its international investment capabilities by introducing two new sovereign wealth funds, Hassana Investment Company and Sanabil al-Saudia, both with initial capitalization of US$5.3 billion. Hassana Investment Company has been investing in real estate, commercial projects, and stock markets in the Middle East and in the West and is also responsible for managing the assets of the General Organization for Social Insurance. Sanabil al-Saudi is a portfolio manager for the Public Investment Fund and invests in a broad range of global asset classes.[5]

During the first three quarters of 2011, holdings of foreign assets grew by a greater amount than foreign liabilities, which resulted in the year-end estimate of US$506 billion in foreign owned portfolio assets. Due to continually increasing oil prices of US$100 and more per barrel and an increased oil production level of 9.4 million barrels a day in 2011 to fill the gap in oil output due to the civil unrest in Libya, Saudi Arabia was able to realize budget surpluses and was then able to invest even more in the international market.[6] Saudi Arabian Monetary Agency's Muhammad al-Jasser said in a speech in late 2011 that the government of Saudi Arabia has been well known for investing

internationally and that they are in no position to discontinue the practice. He also noted that King Abdullah had issued an economic stimulus package in the summer of 2011 which was intended to enhance the purchasing power of its citizens and to increase investment in housing and healthcare, but that the initiatives would not require the country to draw down their foreign assets to fund the royal decrees and that they will continue to stockpile surplus funds into foreign markets.[7]

As predicted in 2008 when the wealth funds were initially funded, Saudi Arabia had released data only on the total monetary value of the sovereign wealth funds and there has been little to no transparency regarding the details of its operations, investment strategies, or holdings in the four years since the sovereign wealth funds' inception. One new development that has been noticed by investment bankers is that sovereign wealth funds in the Persian Gulf are investing less globally than in the last three years and are returning to investing locally and domestically. In 2012, new government financing to Saudi Arabian funds will increase by 8 percent, which is down from a 13 percent increase in 2011. Civil unrest in Middle Eastern countries has prompted many countries to invest locally to improve domestic employment, housing, transportation, education, and their overall economic situations, as opposed to solely investing in an international market that is also in economic turmoil. In 2011, 29 percent of new investments from Gulf sovereign funds were invested in North America, 19 percent in Western Europe, and 33 percent in the Persian Gulf. In 2012, investments in North America fell to 14 percent, 4 percent in Western Europe but increased to 56 percent in the Persian Gulf.[8]

As the Saudi Arabian Monetary Agency's Forty-Seventh Annual Report has shown, Saudi Arabia is operating at record-breaking budget surpluses and will continue

to invest those surpluses into sovereign wealth funds either internationally or domestically. Due to the lack of transparency, it is impossible to know who and what the Saudi Arabian sovereign wealth funds are invested in and how those markets, companies, and funds are doing financially. The only statistic that really matters, however, is the year-end total portfolio total and Saudi Arabia is on track to reach a sovereign wealth fund asset total of more than US$600 billion by the end of 2012.

Investing surplus revenue into diversified portfolio sovereign wealth funds that invest internationally, as well as domestically, is critical in the preparation for an economy that will no longer be rentier. In the event that the security of the Saudi Arabian oil supply were to be compromised, with US$506 billion in sovereign wealth funds and annual budget expenditures of US$174 billion, Saudi Arabia has the option of cashing in their sovereign wealth funds to continue to meet budgeted expenditures for nearly three years. During the attack on Kuwait in the early 1990s, the government relied solely on their international investments, sovereign wealth funds, and savings to continue to meet their budgeted expenditures while they had no revenue or oil exports.[9] In the event that the prediction of this research comes to fruition and Saudi Arabia ceases to be rentier when domestic consumption equals domestic production of oil, three years of sovereign wealth funds is not going to be useful if there is no hope of returning to being a rentier state. Three years out of the rest of the states existence is trivial, but in the event of a breach in security and oil production is slowed or discontinued, the sovereign wealth funds will be able to sustain the country until they are able to begin producing and exporting again.

Parastatal Companies

There are a number of *parastatal* companies operating in Saudi Arabia. Parastatal companies are state-owned intergovernmental organizations, companies, and agencies that provide revenue for the government, possess political clout and influence, but that are run separately from the actual government. Parastatal companies are legal entities that undertake commercial activities on behalf of the government and serve the state either directly or indirectly.[10]

Some of the parastatal companies in Saudi Arabia include Saudi Aramco, Saudi Basic Industries Corporation (SABIC), and Samba Financial Group (SAMBA). Saudi Aramco is considered a parastatal company because it is run independently of the government. It does not rely on the government to engage in day-to-day business activities such as recruiting, hiring, firing, new product development, exploration decisions, investment budgeting, and joint venture liaison work. The income from Aramco was approximately US$210 billion in 2010,[11] but all of that was from oil revenue. With the goal of diversifying the governmental income, the income from Aramco becomes a moot point because once domestic consumption equals domestic production, Aramco will not be making any money in exports; therefore, the government will not be making any money in exports.

The Saudi Basic Industries Corporation (SABIC) is also a parastatal company with the Saudi Arabian government owning 70 percent of the company's shares and private investors in Saudi Arabia and the other countries of the GCC own the remaining 30 percent. SABIC began in 1976 by Royal Decree and today the company has operations in 40 countries around the world with an international workforce of 33,000.

SABIC specializes in the production of chemicals, fertilizers, metals, and plastics. Net profits in 2009 reached US$2.4 billion with total assets of US$79.2 billion.[12] SABIC specializes in products that require the use of oil, which, again, is going to be a problem when domestic oil becomes scarce. In the calculation, domestic oil consumption takes into account oil for industry; therefore, SABIC will still be an income source for the government. There is a possibility that their oil requirements will not be met and that is a scenario that the government must take into consideration while adopting diversification plans for government revenue.

Samba Financial Group is a parastatal company within Saudi Arabia that offers banking services at 66 different branches within the Kingdom as well as 28 international branches. The company's consumer segment offers deposits, credit cards, retail investment products, and consumer loans and savings accounts. The corporate segment provides deposits, loans, corporate finance advisory services, as well as investment, trading, and derivative portfolios. The company's treasury segment manages money market accounts, foreign exchange, and commission rate trading. The company also offers Islamic banking and also manages real estate projects. Revenue for 2011 equaled US$6.6 billion and projected income for 2012 is US$7.4 billion.[13]

Investing in banking, finance, and real estate development is one avenue that will not directly be affected by the reduction in income from oil. There will be a shockwave across the country when the government income is no longer what it has been, but international investment and investors will still contribute to Saudi Arabian government revenue through the banking sector, even when there are no longer any barrels of oil left for export.

Taxation, Zakat, and Hajj as Income Diversification

Taxation

The Saudi Arabian government imposes few taxes, relying on the income from oil, customs duties, corporate taxation, zakat, Hajj fees, and licensing fees for revenue. Government income from oil in 2010 totaled US$108 billion with a combined nonoil income of US$1.5 billion.[14] The extent to which taxation is levied in Saudi Arabia is limited to foreign companies that are not from the Gulf Cooperation Council (GCC) and that have permanent business establishments in Saudi Arabia. On profits less than US$26,667, a tax of 25 percent is levied on corporations. On profits of more than US$266,667, a minimum tax of 45 percent is levied and between the two is a sliding scale. Foreign shareholders who share in the profits of Saudi Arabian companies are assessed a flat corporate income tax of 20 percent. Some foreign investors are able to avoid taxation either partially or completely by participating in investment incentives, such as 10-year tax holidays offered by the government. A Natural Gas Investment Tax (NGIT) is levied to both individuals and corporate entities, which also includes GCC nationals. The profits of these companies are taxed at a base rate of 30 percent and progressively up to 85 percent, depending on the internal rate of return on investment. Import tariffs are 12 percent on everything except defense products and are not assessed on imports from other GCC nations. Essential commodities and defense products are also exempt from customs duties. There is a 20 percent tariff levied on products that compete with local infant industries, regardless of origin, which is why there is an all-encompassing tax on NGIT. All employers, regardless of GCC nation status or of international status, must contribute 9 percent of a Saudi nationals employment salary in

addition to their base salary to pay for insurance related to old age, disability, and death. The Saudi Arabian national employer must contribute a matching 9 percent to the fund. The employer must also pay a 2 percent occupational hazard tax, which is similar to the disability tax but is assessed differently due to the environmental hazards as well as hazards on the job site due to lax regulation of safety standards.[15]

Zakat

There is no personal income tax levied, or taxes on personal goods or services. All Muslims who are mentally stable, free, and financially able and who are living within Saudi Arabia are obligated to pay the 2.5 percent *zakat,* or religious tithing, based on the personal total wealth of each Muslim. Zakat is not calculated according to a Muslims income, but on their combined total wealth. Zakat is calculated on capital earnings from personal wealth, property, and monetary acquisitions. The zakat is obligatory according to the Quran 9:60 and is one of the five pillars of Islam and is also pursuant to the Royal Decree N.17-2-28-2077 of 1380A.H., or 1960. The zakat is due once every lunar calendar year.[16]

The term 'zakat' in Arabic refers to 'growth' or 'purification.' By paying the zakat, the possessions of Muslims are thought to be purified because portions of their belongings are given to those in need. Similar to pruning plants, cutting back individual bank balances encourages new growth. The zakat is designed to support the Islamic community and is intended to be used to pay for hospitals, schools, and for donations to the help the poor. Paying the zakat is not negotiable within the religion and six countries collect the zakat by law: Saudi Arabia, Yemen, Libya, Sudan, Pakistan, and Malaysia.

Each country has a specific institution for collecting the zakat. In Saudi Arabia, collection is controlled by the Department of Zakat and Income as part of the Ministry of Finance and National Economy. Saudi charities and the Department of Zakat and Income receive approximately US$3-4 billion annually in zakat donations. Between 10-20 percent of that is sent abroad as aid to fellow Muslims.[17] The remainder is used to help with social and religious causes, but there is a pervasive domestic opinion that the funds are being mishandled and siphoned off to religious extremist groups such as al-Qaida and the Taliban. Although Saudi Arabia has a Royal Decree obligating Muslims to pay the zakat and the state has a Department of Zakat and Income to process and distribute the money, the Kingdom lacks an effective legal system to impose strict rules on transparency, accounting, and auditing of the Minister of Finance and his employees. The lack of charity control and state regulations paired with noninstitutionalized religious interpretation has contributed to a system that is seemingly honest, but has turned into a corrupt, money laundering scheme.[18]

Hajj and Tourism

Tourism in Saudi Arabia is incredibly limited to Hajj pilgrims and to men entering the country for specific business purposes. Unlike the other Gulf Cooperation Countries, Saudi Arabia does not issue general tourist visas. A person from outside the GCC may only enter if they are granted a *visitor visa*. Visitor visas are exclusively reserved for business related trips into the country and may only be obtained from the company sponsoring the visitor. The company sponsoring the visitor must vouch for the

good character of the traveler upon applying for the visa and once in the country, the sponsoring company is responsible for the traveler.[19]

Despite the strict government laws limiting the number of international tourists, Saudi Arabia is expecting to welcome 15.8 million visitors into the country in the year 2014, up from 13 million in 2010. Of those 13 million visitors, 9.5 million were granted religious visas for the purpose of Hajj. This leaves only 3.5 million visitors entering the country solely for business purposes. With the continuing increase in tourism, whether from Hajj or for other purposes, the hospitality sector has been booming in Saudi Arabia. The growth in religious, business, and domestic tourists has forced the building of at least 381,000 new hotel rooms, mainly in the Mecca area. The government of Saudi Arabia continues to use income from tourism as a diversified source of income and in 2010 committed to invest 3.6 percent of the annual GDP to promote the growth of tourism.[20]

The expansion of the tourism and Hajj industries and the subsequent travelers to use the new facilities will benefit the private sector by allowing them to build and operate new shops, restaurants, hotels, and transportation companies. The government does not operate the businesses on the ground level that are targeted at the Hajj and business traveler, but the Saudi nationals can and should take this opportunity to go into business for themselves and earn money from religious and business tourists. If nationals do not take the opportunity to target the market, foreign workers will do it for them.

The period during Hajj can be considered to be both a source of government revenue as well as a means for privatization. Hajj draws between 2-3 million people per year to Mecca, providing local companies with revenue from shopping, transportation, hotels, dining, and other tourism needs. The government of Saudi Arabia profits off the

Hajj by charging each pilgrim to come into the country to perform the religious rite. Monetary values of activities related to the Hajj exceed US$30 billion per year, the wealthiest pilgrims spending upwards of US$40,000 per person on a Hajj pilrimage.[21]

The Hajj is a set of rituals performed every year for five days in the month of Dhu al-Hijjah. Pilgrims visit the Grand Mosque in Mecca and then follow the route of Mohammad, which begins in Mecca, moves into the desert of Mina, then to Arafat for one day, and then to Muzdalifah and then back to Mina for three days.[22]

The government of Saudi Arabic controls the flow of pilgrims through quotas, allowing each country in the world only one pilgrim per every one thousand Muslim citizens. Indonesia sends the largest number of pilgrims, aside from Saudi Arabia, with 200,000 people attending per year.[23] Visiting pilgrims for Hajj must contact a travel agency specifically designed for Hajj travel. Muslim pilgrims are allowed to enter the country with a government issued religious travel visa, but must be accompanied by a travel agency representative while in Saudi Arabia.[24]

By the year 2025, Saudi Arabia is expecting to host upwards of 17 million pilgrims for Hajj alone. This has created the need to develop an infrastructure in and around Mecca that will be able to accommodate that many visitors. The speculation of hosting that many pilgrims will also give the government an opportunity to profit handsomely off of the religious rite as an income diversification technique. The government owns the land surrounding the Grand Mosque and one square meter of land is currently selling for US$130,000, which goes directly into government revenues.[25]

With the foresight to expect the number of pilgrims to expand exponentially, King Abdul Aziz ordered the first expansion of the Grand Mosque since the seventeenth

century. Mohammad bin Laden, a Yemeni migrant, was given the contract and work began in 1955. The government of Saudi Arabia began an aggressive modernization project in Mecca by destroying most of the historic buildings in the city to make way for newer and larger buildings. The historic marble columns were replaced with artificial stone, 300 foot minarets, and two gates were rebuilt. In 1980, King Fahd constructed a new prayer area and new minarets were built to replicate the first ones from 1955. Since 1980, there has been little that has been done to expand the Grand Mosque or to modernize the amenities in Medina until King Abdullah made it his goal to make Hajj a significant source of diversified income for the country in Saudi Arabia.[26]

In the Fall of 2011, King Abdullah purchased US$10 billion worth of private property in Mecca to expand the Grand Mosque once again. The expansion resulted in increasing the internal capacity of the Mosque from 750,000 worshippers to more than 2 million. The contract for the extension was given to the Saudi Bin Laden Group and it should be complete by 2020. The expansion will add a gate named for King Abdullah and will also greatly increase the number of restrooms and shaded areas available to the pilgrims. The Grand Mosque in Mecca is the only mosque in the world that is not segregated based on sex.[27] King Abdullah also initiated the expansion of the water at Zamzam that is purported to have healing qualities and that pilgrims drink throughout the Hajj. The water is pumped into the Mosque from a purification plant and in 2010, King Abdullah authorized a US$187 million expansion of the plant, which would then be able to filter up to 1.3 million gallons per day.[28]

To update the transportation industry in the Medina and Mecca area, King Abdullah has made plans to include a metro that will connect the city of Medina to the

stops on the pilgrims Hajj route in Mina, Arafat, and Muzdalifah. A high speed rail link between Mecca and Medina will be built around the central part of the city, which will connect high rises and shopping malls. Another construction project that is transportation related is the expansion of the King Abdulaziz International Airport. As part of a US$11.3 billion project, which is due to be completed in 2035, the expansion will increase the airport's capacity from 15 million to 80 million passengers per year. An additional terminal is being built called the Hajj Terminal in order to expedite the travel needs of the pilgrims arriving for the Hajj rituals.[29]

Crown Prince Nayef has also had a hand in the expansion of the Grand Mosque, ordering the doubling of the capacity of the circumambulation area around the Kaaba. Since there are only certain times during the Hajj ritual that pilgrims circumambulate the Kaaba, which is the most sacred site in Islam, Crown Prince Nayef recognized the danger of people being trampled to death and with foresight demanded that the area be enlarged.[30]

The most impressive economic addition to Mecca and to the Grand Mosque is the recently completed US$2 billion Royal Mecca Clock Tower, which is surrounded by shopping, luxury hotels, prayer rooms, parking lots, helipads, and the Abraj al Bait residential complexes. The new addition overlooks the Kaaba and the building is the worlds largest building in square footage and is the second tallest building in the world.[31]

The investment into Mecca, the surrounding areas, and the Grand Mosque is an attempt at increasing Hajj tourism as well as using the event as an income diversification tool for the government. At the beginning of the 1900s, King Abdul Aziz relied heavily on the income from Hajj as government revenue and it is not surprising that current

leadership is also attempting to continue and expand the profitability of being the Custodian of the Two Holy Mosques.

Private Sector Development

Women

In the United States, women-owned small businesses are the fastest growing segments of the economy and the strongest engine for job creation.[32] In Saudi Arabia, the future of the economy and of the overall well-being of the country is slowing coming into the hands and onto the shoulders of Saudi Arabian women. Saudi Arabian women currently enjoy fewer legal and social rights than women in any other country in the world, but they are slowly becoming educated and finding their own place in the global atmosphere. Educated women who pursue entrepreneurialism is a vital sector to the diversification of income, to private sector development, and to the preparation for the end of rentierism.[33]

One indicator of the future of women in Saudi Arabian society is the amount of education they are pursuing. Girls in primary school in Saudi Arabia outnumber boys 53.3 percent to 52.1. The number of girls in intermediate schooling also outnumbers boys 24.7 percent to 24.3 percent. There are slightly more boys at the secondary level of schooling in Saudi Arabia with 23.6 percent and with girls representing 22 percent. Girls fall behind boys at the lower levels of education, representing 48.5 percent compared to the attendance of boys at 51.5 percent.[34]

Women are just as prevalent in higher education in Saudi Arabia as men, and during the 2010/2011 academic year, women outnumbered men with 52 percent

enrollment. There were also more women graduates, outnumbering men 54 percent to 49 percent.[35] Women far outnumbered men in enrollment and graduation with Bachelors degrees, which is mainly attributed to the fact that six out of ten PhD degrees awarded are in Islamic studies, a subject that women are not allowed to participate in to the depth of earning a PhD.[36]

Because the Saudi Arabian state continues to treat women as legal minors, being required to obtain permission and often escort by their husbands and male relatives to even attend academic institutions, many Saudi Arabian women obtain their education abroad. Saudi Arabian women are internationally recognized as doctors, prominent business women running international companies, PhD economists, scientists and professors, deans of colleges and universities, news anchors, journalists, and high-powered women who wield their weight from their education and their large supplies of money. These powerful women live all over the world and contribute to their respective societies, but in their home country, they are still unable to vote and they are still unable to drive themselves to their places of employment.[37]

The women that do remain in Saudi Arabia and enroll in higher-level education graduate at higher percentages than men do. During academic year 2010/2011, 54 percent of all higher education graduates were women, but only 5 percent of the entire Saudi Arabian workforce is comprised of women. In 2011, nearly 60,000 women graduated with higher-level degrees and only 3,000 of them even entered the Saudi Arabian workforce.[38] The Saudi Arabian government uses the Quran as its state constitution, leaving the case for women's rights inseparable from women's rights in Islam. King Abdullah is slowly allowing women more rights in Saudi Arabia, but the burdens of not

being able to drive and forced segregation in the workplace and in school is an enormous cost burden on the individual women, as well as the country. The social discrimination and binding law that does not allow women to drive in a country that has very limited public transportation makes working outside of the home difficult, if not impossible, for the nonelites who cannot afford to hire a chauffeur or if the men in their lives will not drive them. At any given time in Saudi Arabia, there are upwards of one million foreign chauffeurs driving women around the country for a cost of US$4 billion per year. Nearly all of that money is sent to the foreign workers' home countries as remittances. This phenomenon does not help solve the limiting of foreign worker problem and sending US$4 billion per year in chauffer remittances outside of the country is an unnecessary drain on the Saudi Arabian economy. The simple solution to both of those problems would be to just let women drive.[39]

Change is slowly coming to women in Saudi Arabia. In 1999, the first private women's college was established, named the Dar al-Hekma College. The college was backed by the Jeddah business community and is one of the few Saudi Arabian degrees being recognized internationally.[40] Change is also coming to women on the business front as well. In 2001, Prince Majeed, who at the time was the Governor of Mecca, allowed women to create a business women's committee with the Jeddah Chamber of Commerce and Industry. In 2004, the committee was renamed the Khadijah Center. The center currently has its own budget, staff, research, and training for women who are business owners.[41]

In 2003, King Abdullah established the "National Dialogues," which were a series of meetings intended to educate and persuade the Saudi Arabian population into greater

openness and tolerance. Between 2003-2009, there were 8 such meetings, which ranged in discussion topics from reducing extremism, to issues with youth, the job crisis, health, and also discussions about women and their rights and roles in society. In 2004, there was a session only open to women and at the meeting, there was a recommendation for the creation of a women's commission in the government, which would result in a balance between Sharia and everyday life for Saudi Arabian women. The request was denied, but the fact that women had their first public forum was a big step for the Kingdom.[42] A project that was approved, however, was the al Sayedah Khadijah Bint Khualid Business Women's Center. The goal was to facilitate women's employment and entrepreneurship through lobbying, research, and awareness. The Center has since been able to identify obstacles to women's' advancement in business and slowly through research and lobbying is addressing the concerns and finding solutions.[43]

An important educational development occurred in 2005 when King Abdullah announced a new scholarship program, which would fund 5,000 Saudi Arabian students-men, and women, to study abroad, complete with living expenses. The funds were limited to students who were pursuing engineering and science degrees and "safe" subjects such as linguistics. Women still had to obtain permission from their husbands and fathers, but the door was open for them to study abroad on the government's tab.[44]

The first accredited women's university in Saudi Arabia was built in 2009 and named Effat University, after King Faisal's wife. King Faisal expanded education and initiated girls' public education in the early 1960s when women's literacy was less than 2 percent. At the time, conservative religious leaders resisted King Faisal's goals of women's education, so King Faisal made women's education available, but not

mandatory, and gave the religious authorities control over girls' education, whereas boys' education was overseen by the Ministry of Education.[45]

The first enrollment at Effat consisted of 1,000 women undergraduates. While Dar al-Hekma had already been operating for the past 10 years, Effat University is considered to be at the forefront of a social revolution in the Kingdom. The University ascribes to many new and different methods of teaching that are foreign to the religiously conservative and culturally and politically ethnocentric population. All courses, including Islamic studies, are taught in English. Physical education is mandatory. Male professors are in the classroom, face to face with the female students. Students are forced to form their own opinions on a variety of issues, including ethical, moral, and sexual issues. Foreign films are regularly screened without censorship.[46] The University has formed several international affiliations to bring new and relevant courses and degrees to the school. Effat has partnered with Georgetown University in Washington D.C. for help with business administration and with the Instituto de Empresa in Madrid to help coordinate their fashion design courses. Canada's LaSalle College is also a partner and aids Effat with technology in conjunction with Microsoft. The most ambitious program has been the partnership Effat Universty has with Duke University to launch its first engineering program for women in Saudi Arabia. Duke has offered curriculum suggestions, helped build laboratories, and has mentored faculty.[47]

With all of these new education opportunities, more and more Saudi Arabian women are entering into the real world and are ready to own their own companies. After receiving a valuable and useful education, many women emerge from the Universities to find that owning their own companies is challenging, mainly due to the same old social,

religious, and legal traditions that have been preventing women from entering the educational and workforce arenas for centuries. The most commonly owned businesses owned by women are in fashion, jewelry, interior design, photography, beauty salons, retail and wholesale, consulting, marketing, public relations, event management, education, and childcare.[48] Of female registered businesses, 72.6 percent operate outside of the home and 92 percent have paid employees. These business statistics are the highest for women in Saudi Arabia compared to all other Middle East North Africa (MENA) countries.[49]

The three main challenges to the aspirations of women-owned businesses and the growth of the economy via educated women are:

1. Gender obstacles in the regulatory environment
2. Limited access to formal capital and financing mechanisms
3. The need for increased integration of sophisticated marketing and technological tools[50]

Gender obstacles permeate many facets of the process for women to own their own businesses. Women are required, not by law but by de facto expectations, to have a legal male guardian, or *wakil*, to conduct the business or to serve in a management position if the company is a registered public business. A public business simply means that men and women are both allowed to purchase goods or services from the company.[51] Another obstacle is the lack of available business licenses. Socially, beauty salons, for example, are not an approved business for a woman to own, but sewing is, so many women will falsify their business application and register the company as a company that is approved by the business licensing division of the government in order to be able to do

business at all. As discussed previously, the restriction on mobility is an impenetrable obstacle that severely limits the ability of a woman to own a business outside of her home. Abiding by the driving restrictions incurs additional cost to the woman to do business, as well as to her family. The men in the family must take time out of their days to drive the woman to and from her business, which is an additional cost to the family. Women are also unable to travel internationally for business or training without being accompanied by a male relative or guardian. Businesswomen must work around the challenges of the extra costs, delays, and limited foreign training that they are able to receive. Additionally, travel and business visas for foreign women entering Saudi Arabia are strictly limited. If foreign women were able to enter the country to educate and train business women in their own country and town, at least they would have some avenue for outside business education, but that option is also restricted.[52]

Of women who own their own businesses in Saudi Arabia, 82.2 percent rely on their personal savings to fund their own business ventures and 12.9 percent rely on contributions and loans from relatives and friends. The reason for this is two-fold; the first is that banks are less willing to approve loans for women who want to do business on their own and secondly, Saudi women generally lack familiarity with business and finance tools. Many of the women who are educated by the Saudi Arabian government are not allowed to attended courses in business and economics and are therefore unprepared for the business world of finance and economic terminology and concepts. Securing loans from relatives and friends is less daunting than speaking with a male banker who will more than likely deny the loan anyway.[53]

The lack of sophistication and familiarity with marketing and technology is similar to women's lack of business finance familiarity. Marketing and technology are rarely taught to females in the schools run by the government, leaving women to market themselves by word of mouth, leaflets, brochures, and advertisement at the bazaars. Of women who own their own businesses, 56 percent do not have their own website. Due to the travel restrictions imposed on women, learning about Western marketing techniques and technology is limited, leaving women to do the best that they can, with what they have.[54]

Eventually, women-owned businesses will be a significant contributor to the Saudi Arabian economy. Already, the statistics of women owning their own companies is superior to neighboring women in the rest of the MENA region. Saudi Arabian women are more likely to be the sole owners of their businesses than any other MENA country, but they are less hands-on in a management capacity than women in the other countries. Saudi Arabian women business owners are overwhelmingly more educated than the rest of the Saudi Arabian workforce. Of women who own their own businesses, 58 percent have postsecondary degrees. Of the rest of the Saudi Arabian workforce, only 21 percent have postsecondary degrees. Of Saudi businesswomen, three out of ten of them completed their education abroad and have returned to implement their Western-learned business principles in the Saudi Arabian economy.[55]

Women in Saudi Arabia are on the right track for educating themselves and for owning their own companies in order to provide for themselves and their families. The Kingdom does not need to implement any sort of social or cultural programs to convince women of the importance of their role in a new economic society that lacks the rentier

state mentality. When considering what Saudi Arabia is doing to prepare the end of rentierism, there is still much they need to do by way of women's rights and opportunities. While the private universities discussed in this section make women's education look promising, these schools educate a small number of women compared to the amount of degree-seeking women that are living in Saudi Arabia. The nonelites that cannot afford the pricey tuition of the private universities are still able to attend university, but under the rule of the Saudi Arabian government. Courses and degrees for women are limited to "safe" subjects that do not include business, finance, economics, entrepreneurialism, engineering, and most sciences. Islamic studies are still mandatory and the schools are still segregated, causing unnecessary costs to the government. While women are still graduating in larger numbers than men, once out of school, they are still faced with challenging restrictions on their travel, financing options, management abilities, and business licensing opportunities. Overall, the Saudi Arabian government will need to recognize what an important economic asset women are and that they will need to loosen the restrictions on them in order to properly prepare for an economy that is no longer rentier.

Manpower

Reducing the Foreign Workforce

In order to prepare for the end of rentierism, Saudi Arabia needs a reduction in their foreign work force. There are approximately 5.6 million foreign workers. Remittances from those workers total about US$27 billion per year. This amount of money is an enormous amount that if earned by Saudi Arabian nationals could be put

back into the economy and used to boost individual monetary independence. The Saudi Arabian government has begun limiting work permits, but because 70 percent of the population is under the age of 30 and the unemployment rate is about 28 percent, there needs to be a more urgent application of the limitation of foreign workers.[56]

One of the current policies that has slowly come into effect over the last two years is the requirement that all firms doing business in the Kingdom, whether foreign or domestic, must employ Saudi Arabian nationals at a rate of at least 10 percent of their entire workforce.[57] This ruling was in made in concert with the law that the government will not renew work permits of foreign workers who have already been working in the country for six years. These two actions were part of another program directed at Saudization, but that has not created any more job openings for nationals.[58]

In 2011, another effort at creating more jobs was introduced and it was to create salary protection in order to keep the majority of remittances within the country. The Saudi Labor Minister Adel Fakih introduced the program that ideally was to put a 20 percent ceiling on total guest workers in the country at a time. The Minister claimed that over the next 3 years, available employment for foreign workers would decline by 50 percent, leaving those job openings available for Saudi nationals. This action is part of a 30-point Saudization program that is aimed at increasing jobs for nationals, incorporating women into the workforce, and providing unemployment assistance to the unemployed. This program initiative is the first time that unemployment compensation has been discussed in the history of the Kingdom. What the program lacks, however, is the emphasis on educating nationals in order to make them marketable to the private sector.

What the initiative will do, is it will put 1.5 million Egyptians out or work and force them to seek employment in other countries or to return home.[59]

In order to stave off a domestic unemployment catastrophe, the Kingdom needs to produce 3 million new jobs by the year 2030 and 14 million new employment slots for nationals by the year 2050. Limiting the number of work visas that are issued and by limiting the length of stay for foreign workers will limit the population and ideally will open the door for more employment for Saudi Arabian nationals. The Saudi Arabian plans do not, however, distinguish between skilled and unskilled labor when determining work permits. This paper asserts that if it were not for the educated and knowledgeable workforce employed at Saudi Aramco, the oil industry would not have evolved as quickly or efficiently as it did. Until the education and experience level increases among Saudi Arabian nationals, it would behoove the Kingdom to take another look at simply putting a blanket limit on work permits.[60] The Saudi Arabian mentality is still that of a rentier mentality and they still do not have the work ethic, culture, or skill set to replace all educated foreign nationals. If foreign worker limitations occur too quickly, the private sector will be annihilated. Forcing private companies to hire a certain amount of Saudi Arabian nationals, at higher rates than they could foreign workers, could be devastating to their bottom lines. Small business closures would have an enormous impact on economic growth in the Kingdom. Forcing small businesses to fire an already trained and knowledgeable workforce would force them to swallow the costs of rehiring Saudi Arabian nationals, retraining their workforce, and possibly paying a higher salary.[61]

Saudi Arabia needs to tread lightly on removing a workforce that will work harder and cheaper than a national one, but removing an increasing population of foreign

workers that are a drain on the national government is vital to maintaining rentierism. Campaigning to encourage the workforce to become educated and to desire employment will be vital in taking the unemployed men off the street and putting them into jobs that they can become financially independent while doing. Foreign nationals drain the government of subsidized benefits, even if they are not given them directly. Foreign nationals still use the infrastructure, they use the healthcare facilities, they drink the desalinated seawater, they consume the cheap petroleum, and while in the country, they also procreate. Saudi Arabia does not acknowledge citizenship for children born in the country, but they are still part of the population explosion problem.

The best-case scenario for oil production meeting oil consumption will occur in the year 2033. That scenario accounts for a population growth rate of 1.55 percent. If the Kingdom of Saudi Arabia can decrease that rate even by a few tenths of a point, the right side of the bell curve could be extended much farther down the line than 2033. Every new person consumes 25 barrels per year and each barrel that is domestically consumed is a barrel that is not eligible for export and profit. Keeping the population growth rate to a minimum is an imperative activity that the Saudi Arabian government needs to start acting on immediately.

Energy Security

The two main threats to economic and political security that would affect the ability of Saudi Arabia to maintain rentierism is terrorism and Iran. When the United States used Saudi Arabia as a home base in the fight to contain the Soviet Union from invading Afghanistan, the United States formed a group of fighters called al-Qaida,

which means "the base." Osama bin Laden, a Sunni Islamic fundamentalist, was the leader of al-Qaida and his goals for the organization were to establish the rule of God on earth, attain martyrdom in the cause of God, and to purify the ranks of Islam from the elements of depravity.[62] The United States did not leave immediately after the war against the Soviet Union or after the war with Iraq. Osama bin Laden became the voice of anti-imperialism and anti-Americanism so in 1998, bin Laden and other al-Qaida leaders issued a declaration calling on all Muslims to kill Americans and "those that are allied with them from among the helpers of Satan."[63] Since the declaration, al-Qaida has been linked to numerous acts of terrorism against the West, which have included assassinations, bombings, kidnappings, hijackings, and suicide attacks. The organization has been known to target prominent symbols such as public buildings, embassies, and Western military personnel and housing units.[64] Al-Qaida maintains and performs their operations by earning money from fake business operations, donations from like-minded supporters, and they also siphon off funds from zakat donations and from Muslim charitable organizations. It has been no secret that the House of Saud and fellow Saudi businessmen have supported militant organizations, especially al-Qaida.[65] Government funding for mosques, madrasas, and charities have all contributed to the spread of fundamentalist Islam and subsequently, the spread of al-Qaida and other similar organizations.[66] The main problem with funding fundamentalist organizations that are anti-Western is that they are not afraid to bite the hand that feeds them. The primary threat to oil security in Saudi Arabia is from al-Qaida. Osama bin laden accurately observed that oil is crucial to the well-being of the United States and his hatred of Western values and their modus operendi of imperialism was a threat to his views of

Islam and the Islamic way of life. Bin Laden named his war against the United States as the 'Bleed America to Bankruptcy War," and claimed that the low oil prices that the West has enjoyed has been the "greatest robbery in the history of the world."[67] Bin Laden recognized that oil is an important economic power for the Islamic state and, therefore, he would not attack the wells themselves because all Muslims need oil. He did agree that attacking the transportation and infrastructure, including pipelines, refineries, the executives of non-Muslim oil companies, ocean tankers, sea ports, and government officials that negotiate with the United States would be equally effective. Striking oil and gas facilities accomplishes two goals: undermining the internal stability of the regimes they are fighting and economically weakening foreign powers with vested interests in the region.[68] Attacks conducted by al-Qaida and their allies against oil infrastructure have been few and far between. In 2002, they attacked a French oil tanker and in 2003, there were preemptive attacks by al-Qaida on civilians in Riyadh. In 2004, there were lethal attacks on personnel of Western oil companies in Yanbu and Dhahran and in 2006, there was a car bomb that exploded at the gates of the worlds largest oil refinery, Alqaiq, in Saudi Arabia. The attack resulted in a hike in oil prices by US$2 per barrel and it was termed the "terrorist premium."[69]

In 2010, Yemen-based al-Qaida leader Qassim al-Rimi called for the killing of Saudi Arabian rulers on the grounds of apostasy. They suggested killing all Christians on the Arabian Peninsula and overthrowing the entire Saudi Arabian government.[70] The al-Qaida based in Saudi Arabia called for attacks on the government of Saudi Arabia, also in 2010, because of their support for Western wars against terrorism in Iraq and Afghanistan.[71] In 2010, Saudi Arabia arrested 113 alleged al-Qaida militants, of which

58 were from Saudi Arabia and 52 from Yemen. Authorities found weapons, ammunition, and suicide belts and the intended targets were oil facilities.[72] The fact that Saudi Arabia continues to support fundamentalist groups, yet is also friendly to the West, is found to be contradictory to organizations whose primary goal for existence is to rid the Middle East of Western influence. While few attacks on oil facilities or related to oil diplomacy have occurred, the threat of it is still present and a consequence that the government of Saudi Arabia will have to prevent against. If al-Qaida or a related fundamentalist group were to damage transportation and infrastructure to the point that the Saudi Arabian government no longer could earn money from exports, life as Saudi Arabian nationals know it would be in danger of deteriorating. If attacks were to happen prior to the government finding an alternative income to oil, basically all operations in Saudi Arabia would stop. Mineral mining and extraction would cease because the industry is so heavily reliant on oil and water to conduct its business. Natural gas would be impossible to extract because it relies on the technology of oil extraction and the related facilities to refine it. Potable water would be limited because the desalination plants rely on energy from oil to operate. Energy, exports, and potable water would be in jeopardy if al-Qaida were to attack oil-related facilities and infrastructure. Neither the House of Saud nor the government could afford to take that kind of hit to national income without having a back-up plan for income and basic social needs and services. This possibility of attack is enough of a reason to seek alternatives to the income oil provides, as well as the energy, even if the concept of decreasing oil is not. The Saudi government, as well as wealthy private nationals, must discontinue funding fundamentalist

organizations and neutralize the threat from al-Qaida and allies against the oil infrastructure as well as against the House of Saud.

Iran

The second security threat to maintaining rentierism in Saudi Arabia is Iran. Currently, Iran is supposedly in the process of building a nuclear weapon. In November 2011, The International Atomic Energy Agency (IAEA) released a report detailing the research and experiments geared toward the development of a nuclear weapon in Iran. The report examined the country's detonator development, the multipoint initiation of high explosives, and nuclear payload integration into a missile delivery vehicle.[73] The announcement was not without controversy, with former Saudi ambassador to the United States Turki al-Faisal warning that a regional nuclear arms race could start if Iran does not curb its nuclear efforts. He furthered those sentiments by claiming that if Iran does develop a nuclear weapon, it would leave Saudi Arabia no choice but to also develop one and to pursue policies that would lead to "dramatic consequences."[74]

Since November 2011 when the IAEA report was released, economic sanctions imposed by the United States and the European Union have sharply escalated. The United States claimed the reasons for imposing sanctions included the fact that Iran has conducted major naval exercises close to the Strait of Hormuz, has tested midrange missiles and that Iran has threatened to close the Strait of Hormuz if confronted with an embargo on oil exports. These sanctions have sparked concerns over the availability of oil and of a potential Western military presence in the Middle East. In December 2011, the United States imposed economic sanctions on the financial institutions that deal with

Iran's central bank, which is the main clearinghouse through which Iran deals with trading partners around the world. The sanctions also ban the import of Iranian oil among member states that agree to the sanctions. Iran's largest oil trading partners, Japan, China, and South Korea, have been forced to meet with oil producers from other countries in order to replace their Iranian oil imports. Western sanctions are also in the works to force foreign banks to terminate all financial transactions with Iran, which targets private and government controlled Iranian banks. Other sanctions also include the limitations on Iranian nonluxury consumer good imports, as well as stopping Iranian international purchases of military and nuclear related goods.[75]

Iran is the fourth largest oil producer and also the fourth largest oil exporter in the world. They produce 3.45 million barrels of oil per day and have a sustainable production capacity of 3.51mbd. One-third of Iranian crude is exported to European Union nations; its main buyers include Italy, Spain, and Greece. Thirty percent of Turkey and Greece's total oil comes from Iran. Iran is China's second largest supplier of light sweet crude, as well as heavy sour crude, only behind Saudi Arabia. Sanctions on Iran not only effect Iranian income potentials; they also negatively affect the export of oil in the entire Middle East and North African region. The Strait of Hormuz sees the transport of 17mbd of crude, refined oil. If economic sanctions force Iran to fight back and close the Strait, shipping complications for Saudi Arabia would be enormous. Saudi Arabia would have to divert 2.5mbd via the East-West pipeline to the Red Sea, severely complicating their transportation logistics. Iran has threatened serious consequences to fellow OPEC members if they step in to replace banned Iranian crude barrels.[76]

Western sanctions on Iran will result in a heavy burden placed on Saudi Arabian oil fields, as well as on Saudi Arabian relations with Iran. If Saudi Arabia tries to resume its position as swing producer to replace barrels lost by the ban on Iranian crude, the rate at which the oil fields will be producing will further permanently damage already fragile oil fields. The strain on manpower, equipment, and on the natural components that provide oil will prove to hurt Saudi Arabian production down the road and possibly drastically reduce their reserves in the future. If the Kingdom cannot produce enough to cover their domestic demand as well as for their normal operations plus replacement barrels, someone will be short on oil. The government of Saudi Arabia will have to decide whether domestic consumption will suffer of whether export income will suffer.

Another main obstacle to maintaining rentierism aside from dealing with replacement barrels also includes the fact that if Iran actually does produce a weapon, Saudi Arabia will be forced to produce one also. As Turki al-Faisal warned, Saudi Arabia will have no choice. The amount of money and effort that would go into producing a nuclear weapon would directly be taken out of the money and effort that could go towards diversify the economy, educating its nationals, and investing in an alternative income to oil. The Saudi government already spends US$45.2 billion a year, or 11.2 percent of the GDP, on military and defense. Diverting more money and effort to compete in an arms race with Iran will dramatically shift the focus of the government from maintaining rentierism and providing for the increasing population, to investing their energy into producing a nuclear weapon, so as to not be outdone by their neighbors.

Securing Saudi Arabian Oil

The United States firmly believes that there is no end to Saudi-American relations while oil is still bountiful. The United States imports in excess of 1 million barrels of Saudi oil every day.[77] The United States is Saudi Arabia's largest import and export partner. Saudi Arabia's exports to the United States average US$18 billion per year in oil and other natural resources, while the imports into Saudi Arabia from the U.S. average US$4.5 billion per year, which include defense, aviation, transportation, medical, and agricultural products. Aside from the typical imports and exports that are exchanged, the Saudi Royal Family, as well as a large number of private Saudi businessmen, have large investments in U.S. oil, transport, tourism, and financial industries. Going hand in hand, a number of these Saudi investors enjoy close relationships with some of the senior people in the United States political hierarchy. These relationships have allowed them to participate and bid for lucrative business and investment opportunities within the United States, making Saudi Arabia one of the largest foreign investors in the United States economy. The US Department of Energy estimates that the U.S. will be strategically dependent on imported oil through at least 2035, which does not take into account imported manufactured goods that are made from oil. While this is the case, the United States has finite military power and both the United States and Saudi Arabia face threats to its security as well as to its oil. The United States is one of the largest purchasers of Saudi oil and a continued safe supply of petroleum is vital for the economy of the United States. Saudi Arabia is located in a strategic position in the Middle East and Islamic world. The Kingdom occupies the largest area of land in all of the Middle East with coastal borders on the Red Sea as well as the Persian Gulf. It shares borders with seven

countries in the region and is friendly with its neighboring oil- and nonoil producing nations, making countries easily accessible from U.S. bases that are located within Saudi Arabia.[78] The United States believes that arming and training Saudi Arabia to help in the defense of their precious natural resources will deter potential threats and it will also multiply ground and air forces needed to protect against terrorism and colonialism. The most recent arms package creates an interdependence between the Kingdom and the United States, fostering a strong Saudi incentive to work with the United States for at least the next 15-20 years. Due to the complicated and classified nature of the arms and weaponry, Saudi Arabia is dependent on U.S. machinery, replacement parts, technology expertise, and maintenance to keep their new purchases operational.[79]

The United States has made it a priority to ensure that the Saudi military, the Saudi National Guard, the Saudi navy, and all types of defense outlets are well armed in order to protect the oil fields and the national security of Saudi Arabia as a whole, as well as the members of the GCC. In 2011, the United States finalized the largest ever Foreign Military Sales (FMS) program in the history of their relationship.[80] The sale included the sale of $US60 million worth of E2-A AWACS surveillance aircraft, Sikorsky's UH-60 Black Hawks, and Patriot and Hawk missile defense systems, 84 new Boeing F-15 combat aircraft, air to surface missiles, 60 AH-64D Longbow Apache attach helicopters, 72 UH-60 helicopters, 36 "Little Bird" MH-6 helicopters, M1A2 tanks, and upgrades to the Patriot PAC 2 missile forces. The transaction of this arms deal meets the Saudi concerns of force expansion and modernization and provide the basis for full interoperability with U.S. military forces in crisis or conflict. The deal assures the United States' strategic position in the Middle East as well as reinforcing the level of regional

deterrence rather than threatening it. A well-armed Saudi military reduces the amount of forces that the United States would have to commit to the region in the case of a threat and with superpowers like China becoming key players in global energy, protecting the precious natural resource that fuels the entire world becomes even more important.[81]

The massive arms deal provides the Kingdom with the ability to improve the overall protection of its borders and will assist against any serious domestic or international terror attacks and will guarantee the preparedness for attack against any enemies from the Red Sea and Persian Gulf region. Yemen is also a legitimate threat to Saudi safety because they are an impoverished nation with primitive infrastructure, serious water shortages, and a large, drug-driven economy with limited oil exports. Yemen's government is growing steadily weaker and the United States fears that Yemen could become the new base for al-Qaida operations in the region since the Yemeni Shia rebel group, the Houthi, have already been active in attacks against Saudi Arabia. The United States and Saudi Arabia have banded together to provide economic aid to Yemen in order to build up Yemeni military forces and counterterrorism capabilities. The U.S. has carried out drone strikes in Yemen and with increased economic and political aid, the U.S. has hope that Yemen will be able to fight against homegrown terrorism and prevent Yemeni attacks against Saudi Arabia.[82]

The likelihood of seeing attacks from Somalia is also on the radar for possible action by Saudi and U.S. forces. Somalia is at risk for coming under the control of a radical Islamist extremist movement called the al Shabab, which means "the youth" or "the young men." Threats of piracy off the coasts of Somalia have become a major threat in the Gulf of Aden and have included attacks on oil tankers and commercial shipping

tankers. This situation has already led to U.S. deployments and a significant Saudi buildup of naval fleets in the Red Sea, mainly off the Yemeni border. U.S.-Saudi cooperation to curtail these terrorism attacks has resulted in the expansion and modernization of the Saudi Red Sea Naval Fleet.[83]

Securing the oil fields and preventing against domestic and international terrorism is key to political as well as economic stability in a rentier, as well as postrentier, state. While the state is attempting to prepare for the end of rentierism, any variation to their monetary or government structure would put them back significantly. The distraction of having to secure their primary income source or the replacement of a member of the Royal Family would drastically alter the political and economic landscape, and Saudi Arabia cannot afford to have any setbacks while trying to prepare for the end of rentierism.

Preventing a Restive State

Just as preventing domestic terrorism and securing oil and natural resources are important political actions in preparing for the death of rentierism, so is preventing the uprising of a domestic restive population. Beginning in December 2010, Egypt, Tunisia, and Libya experienced mass antigovernment social uprising. Acts of self-immolations were recorded in Tunisia, Egypt, and other parts of the Arab world, including Saudi Arabia. A man in the town of Samitah, Saudi Arabia set himself on fire and died a month later in a hospital.[84] Other countries in the Arab world have experienced social uprising and in Egypt, Tunisia, and Libya, the leaders either fled, were ousted, or were assassinated. The self-immolation of the man in Saudi Arabia was the first such incident

in Saudi Arabia and the act was not followed by massive uprising by the population. Small demonstrations over labor rights that took place in April 2011 in Riyadh, protests against anti-Shia discrimination, and calls for the Peninsula Shield Force to be withdrawn from Bahrain were the extent of the social unrest in Saudi Arabia during the Arab Spring.[85]

For a country that is so tightly run by one Royal Family and a very strict interpretation of Wahhabi Islam, it is peculiar that Saudi Arabia did not experience the same type of uprising that the rest of the Arab world did. Thomas Lippman, the author of *Saudi Arabia on the Edge* posits that the leaders of the Al Saud family have spent their time in power skillfully and diligently extending their power and building a loyalty that is unrivaled in the Arab world. Lippman explains this loyalty as "ties of blood, money, marriage and patronage wrapped in the green cloak of Islam."[86] The internal opposition that exists does not want to overthrow the family; they do seek to reform it, however. But, those attempts at reform have been met with exile, imprisonment, and death by those who have tried. The population is so incredibly homogenous and the majority want the same things as their neighbors and as the Royal Family. Saudi Wahhabi nationals do not want to be exposed to pornography, or to sinful substances like alcohol or drugs. It is a devout population that believes in the primacy and the inviolability of Islam and therefore endorse its immunity from challenge. The representatives such as the House of Saud and the ulema are representatives of the ruled, not out of step with them.[87]

People in Saudi Arabia naturally want a degree of participation, but because of their rentier mentality and the flexibility of King Abdullah about the social realities that are ever-evolving, his population trusts his judgment. The population believes that King

Abdullah will leave a country that is better organized, more stable, and has a greater degree of public acceptance. There is a slow evolution of citizen participation, but it is there.[88]

The Al Saud family is the only leadership that the people of Saudi Arabia have known. They are viewed as the creators of the modern Kingdom and are viewed as the glue that hold everyone together, but also the ones who provide the benefits and subsidies. King Abdullah is the supreme authority, but he is not a dictator. He rules by consensus and the Saudi Arabian people view the religious establishment as a legitimate form of checks and balances for the Family.[89]

In light of the Arab Spring, King Abdulla bestowed US$100 billion in housing, salary, and education benefits at the height of the unrest to his population.[90] As mentioned in this research, the population is able to be quelled in the light of unease by being subsidized. The population currently is in a position that while they may desire a more free and participatory role in government and social issues, they are cautious to bite the hand that feeds them. The question, though is what will happen when the government is no longer able to provide subsidies because of the death of rentierism and their lack of preparation to maintain it? There is the possibility that the population will become restive if they are no longer receiving the subsidies to which they have grown accustomed. But, in the case of Saudi Arabia, there is no alternative to leadership that could fill the void of rentierism benefits. Continuing to take actions like the King did, and 'paying off' his population so that they would not rise up, was one of the most important premeditative policies that he could have performed. Keeping the population content while the government prepares for the end of rentierism is important. The same

can be said about securing the oil and preventing against domestic terrorism. If any leadership body currently in Saudi Arabia can prepare for the end of rentierism, it can only be the House of Saud.

Conclusion

The premise of this research was to determine when the end of rentierism will occur in the Kingdom of Saudi Arabia as well as to analyze the actions that the government is taking in order to prepare for it. After compiling population growth, domestic consumption demand, and depreciating oil production statistics into four separate future predictive scenarios, the results were that the end of rentierism will occur between 2022-2033 in Saudi Arabia. Contributing to the prediction is the exploding population, the rapid increase in domestic consumption demand, and the quickly depreciating daily oil capacity.

Analysis on the social, economic, and political landscapes was conducted to illustrate the current social and economic obligations that the government currently has. The research concluded that the social relationship between the population and the government is limited to the allocation of benefits and subsidies. Taxation is not required and representation is not demanded. The economic obligation of the government is to provide uninterrupted benefits and subsidies to the Saudi national population as well as to provide handsomely for the members of the Royal Family. The research found that the methods that the House of Saud uses to fund their extravagant lifestyles is often corrupt and that it at times completely bypasses the National Treasury and goes straight into the bank accounts of the Al Saud princes. The population is aware of the corruption, but

currently does not exhibit any tendencies or plans of turning the Kingdom into a restive state.

The political landscape of the Kingdom is one of consensus with the religious elite, but also one of dissent within and between the Royal Family members. Competing liberal and religiously conservative ideals have paralyzed much of the modernization and further economic diversification developments. There has been, however, agreement between the House of Saud and the ulema to expand the development of Hajj and tourism infrastructure as an economic diversification technique.

Efforts at privatization and increasing Saudi national employment have been stymied by a repressive religious educational system that focuses more on extreme Wahhabi Islam teachings and less on valuable business and economic skills that are in high demand in the country. Expatriates and foreign workers come to Saudi Arabia with skill sets that employers require and Saudi nationals are often overlooked for the cheaper yet more knowledgeable foreign national employee.

The research showed that there are changes coming to Saudi Arabia's women in the form of private schools with also some limited opportunities in business. The cultural and religious restrictions severely limit the opportunities that women have to make money and become educated and without the relaxation of many of the social restrictions on women, they will not contribute much to a privatized economy.

Alternatives to government income from oil were thoroughly examined, resulting in the conclusion that aside from nuclear power, which is currently not politically feasible in the Kingdom, there are no viable natural resource alternatives to oil in order to maintain rentierism. Natural gas is a natural resource that can be used to greatly replace

the use of oil domestically, thus freeing up more barrels of oil for export, which could possibly delay the end of rentierism, but currently, natural gas is not being used to its full potential.

Other forms of alternative income also proved to not be feasible to replace the income from oil. Income from Hajj is constantly increasing, but much of the income from the annual pilgrimage goes to private nationals and companies and only a small part of the income goes straight to the government in the form of revenue. The collection of the zakat and taxation has proven to also not be a feasible alternative due to the lack of accountability and transparency, with much of the money being siphoned off into terrorist and Royal Family bank accounts, or sent abroad.

The country is heavily invested in sovereign wealth funds, but if income from oil stopped this year, it would only be a matter of a few years to draw the entire amount down. Current international holdings equal approximately US$506 billion, but with an annual budgeted government expenditure of nearly US$200 billion, the country is not invested nearly enough to maintain rentierism solely on international investment income.

Parastatal companies were researched but the primary obstacles to using those companies as a replacement for oil is that most of the companies owned by the government are oil companies, petrochemical companies, or other companies that rely heavily on oil for their income. Whether SABIC directly uses oil or not, it is still completely reliant on it as a means of doing business. The parastatal companies that the government owns simply are not diversified away from oil to provide any kind of reliable alternative to oil income.

In conclusion, after researching all possible avenues for the government of Saudi Arabia to maintain rentierism, even combined, these options are not enough. The population is growing too fast and the economy is not keeping up. Oil is a finite natural resource that has resulted in a rentier mentality and a nearly pure rentier economy. The government has committed to providing subsidies and benefits to a population that is experiencing rapid growth and as the barrels of oil set for export dwindle, so will government revenue and thus social benefit allocation. The country as a whole is currently severely unprepared for the death of rentierism. The prophecy of Sheikh Rashid bin Saeed al Maktoum may come to fruition for the country of Saudi Arabia if they do not begin setting economic diversification goals that have timelines and accountability. The desert may just very well reclaim its former inhabitants if the religious and familial dissent cannot be overcome, if the population growth rate keeps skyrocketing, and if the population refuses to abandon their rentier mentality and continues to refuse to become educated and to take whatever employment is offered.

With limited arable land, little to no manufacturing outside of the oil and petrochemical sectors, combined with a population who are unmotivated to work and a Royal Family that will siphon off as much money as they can get away with, the outlook for the Kingdom of Saudi Arabia looks grim. It may seem like an exaggeration to think that the people of Saudi Arabia may return to a Bedouin lifestyle, complete with a return to a merchant class system and camel trading. But, if the cities no longer have anything to offer by way of security, employment, or government income, the idea of returning to the desert, to their Bedouin roots, does not seems too outlandish or even that unlikely.

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