

Petrobras in Nigeria: Valuation of the Agbami Oil Field

By June of 2008 Petrobras (PB) had spent 10 years and nearly \$500 million USD in Nigeria's Agbami field and had yet to see any revenue. However, the Petrobras team and partners had every reason to believe that the project would be extremely profitable. Agbami was the largest deep-water exploration in the world at the time, with an estimated 1 billion barrels of oil reserves. David Passami, the VP of Strategy for PetrobrasNigeria, was charged with the difficult decision of whether or not the company should sell their stake in the field – Statoil had just made an offer to buy out their 13% share at a price tag of \$1 billion USD.

This decision weighed heavily on Passami since Nigeria was PB's second largest foreign investment and Agbami was the biggest holding in the region. In addition to the value of the investment, David had to consider PB's other partners in the venture, including the Nigeria government, Famfa - a Nigerian oil company, and U.S. oil giant Chevron. What would these major players think if PB attempted an exit and how would PB's decision impact future partnerships in Nigeria and other regions? After all, "in the international arena, rocks and relationships are the foundation for successful exploration."¹

Petrobras

Petrobras, short for Petr leoBrasileiro, was founded in 1953 by Brazil's president Getulio Vargas. It was created with the objective "of executing, on behalf of the Federal Government, the activities of the oil sector in Brazil," and with the underlying mission of spurring development in the country.² At the time, criticism abounded regarding the idea that the state should fund an oil company, and its supporters were called, "lunatics, communists and out of touch with international development trends."³ International oil agencies argued that the likelihood of finding commercially viable reserves in Brazil was small. Further, they speculated that even with a discovery, the country would be unable to extract the oil from deep-water reserves miles offshore in the Atlantic Ocean.⁴

This case was prepared by Nikita Agarwal, Jacob Anjilivelil, Mahesh Damodaran and Jesse Schwarz for the Advanced Topics in Corporate Finance course under the supervision of Professor Campbell R. Harvey and was written as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

Over the last 55 years the company has grown tremendously, evolved, and disproving many skeptics, has become one of the biggest players in the deep-water oil reserve arena, and the eighth largest oil and gas company in the world. The Brazilian government still has a stake in the entity—it owns 56% of the common shares.

Petrobras began international exploration in the 1980s. Discoveries throughout this decade helped establish its expertise in deepwater exploration and production. In 1980 Petrobras discovered an oil field in Iraq, which became an important trading partner during this period. Concurrently, the company was drilling in Angola and in the Gulf of Mexico. The mid 1980s saw production in the deepwater Campos basin off the coast of Rio de Janeiro state. With the discoveries of oil in the Campos basin in 1988 as well as the Marlim and Albacora-off-shore fields in Brazil, Petrobras more than tripled its oil reserves.⁵

In 1997, when Brazilian government approved Law N. 9.478, Petrobras ceased to exist as a monopolist in the Brazilian oil industry.⁶ While this allowed an inflow of competitors into Brazil, it was a fortuitous moment for Petrobras as it was able to reorganize and accelerate overseas expansion plans. It changed its investment strategy and wanted to become a truly global player both in attracting investors and by operating in various countries. This strategy also assisted the Brazilian government in building stronger political relationships with various governments around the world. By 1998 Petrobras had made its first move into Nigeria. Key reasons for entering this market included the great deepwater potential in the region (for which Petrobras was becoming an expert), the “sweet” quality of the oil in the region, and lower transportation costs for oil from the region than from the Middle East, due to the shorter distance between Nigeria and Brazil.⁷

Oil Industry Background

Crude oil, or petroleum, has been in existence in for over 4000 years. In the early- and mid- 1800s, Russia and the U.S. began producing significant quantities of oil for commercial purposes.⁸ For much of the 19th and 20th centuries, these two countries produced most of world’s oil. While oil was found in large quantities in the Middle East, it was only after World War II that this region took the lead in oil production. As the demand for oil increased due to the Industrial Revolution and world wars, oil rich countries gained worldwide recognition and began to influence the world economy and politics.

During the Arab-Israel war in 1973, many oil-producing countries in the Middle East enforced oil embargos on the U.S. and other Western countries. The supply shortage increased the prices of oil by nearly 4 times. In 1979, fueled by the Iranian revolution and the Iran-Iraq war, prices nearly doubled.

In 1998, over 1 trillion barrels of oil reserves were proven to exist, with about 79% reserves found in Organization of Petroleum Exporting Countries (OPEC), which included Nigeria. By 2008, the reserves increased to 1.2 trillion barrels with only 69% located in OPEC countries.⁹

In order to understand the workings of the industry, it is important to become familiar with the different stages of oil production. There are four stages before oil is marketed to consumers. In Stages 1 & 2, called upstream stages, oil reserves are identified, explored and later extracted. In Stages 3 & 4, described as downstream stages, the crude oil is refined to extract various petroleum products and then transported to end users. The following table briefly describes each stage:

Upstream

1. Exploration – geologists and scientists search for hydrocarbon deposits using sophisticated technologies to determine the extent of deposits beneath earth.
2. Extraction – wells are drilled and usable oil is extracted

Downstream

3. Refining – the extracted oil is refined in large industrial processing plants into useful petroleum products, such as gasoline, diesel, heating oil, kerosene, asphalt base and liquefied petroleum gas.
4. Transportation – the petroleum products are transported through trucks, pipelines and oil tankers to consumers.

Background on Nigeria Politics and Economy

On October 1, 1960, Nigeria gained its independence from the United Kingdom. The newly formed state comprised a number of ethnic groups that wanted to form their own sovereign nations.¹⁰ Nigeria's newly formed government was composed of a coalition of conservative parties beset with conflict and hostility caused by the cultural and political differences among Nigeria's dominant ethnicities. It was primarily these differences within the electoral and political process that led to several back-to-back military coups starting in 1966. After 33 years of military rule and a civil war that claimed 1 million lives, Nigeria re-achieved democracy in 1999 when it elected Olusegun Obasanjo, the former military head of state, as the new President. The current President of Nigeria, Umaru Musa Yar'Adua, was elected in 2007.

Historic Economic events: Nigeria's oil-rich Niger Delta has been an important resource for the country. During the oil boom of the 1970s, Nigeria joined OPEC. Billions of dollars generated by production in the oil-rich Niger Delta flowed into the coffers of the Nigerian state. The capital-intensive oil sector provided 95% of foreign exchange earnings and about 80% of budgetary revenues. However, increasing corruption at all levels of government siphoned most of these earnings.¹¹ The oil boom benefited the northern military faction while the Nigerian people and the economy did not see the same economic gain. The Nigerian government, similar to prior military rulers, became increasingly dependent on rising oil revenues and failed to promote economic stability. Following the signing of an IMF stand-by agreement in August 2000, Nigeria received a

debt-restructuring deal from the Paris Club and \$1 billion credit from the IMF, both contingent on economic reforms. Nigeria pulled out of the IMF program in April 2002, after failing to meet spending and exchange rate targets, making it ineligible for additional debt forgiveness from the Paris Club.¹² In early 2008 the government began to demonstrate political will to implement market-oriented reforms urged by the IMF, such as modernization of the banking system, curbing inflation by blocking excessive wage demands, and resolving regional disputes over the distribution of earnings from the oil industry.

Current situation (2008): With oil prices soaring above \$100 a barrel, it would seem as though Nigeria is now economically secure (see Exhibit 7).¹³ The country has successfully dealt with many of the political and economic issues it faced. Nigeria has written off its sizable external debt and foreign reserves have expanded more than 10 times in recent years: \$55 billion in oil earnings have flowed into the treasury in 2007 with an estimated \$76 billion expected in 2008. Though Nigeria has so far survived its own elections, the political and electoral system is still held hostage by corrupt members of the political elite. Within the economy there exists growing resentment and discontent caused by massive regional imbalances and growing inequality between the rich and the poor. Adding to anxiety in political circles is speculation about the health of the President, Umaru Yar'Adua who suffers from a chronic illness and was recently rushed to a hospital in Germany for 10 days. A Supreme Court ruling on the legality of his election is still pending and there is ample motive for Nigeria's political schemers, which could lead to political upheaval between different factions.¹⁴ Agitation for better resource control in the Niger Delta, Nigeria's main oil producing region, has led to disruptions in oil production and currently prevents the country from exporting at 100% capacity. Conflict in the Niger Delta arose in the early 1990s over tensions between the foreign oil corporations and a number of the Niger Delta's minority ethnic groups who felt they were being exploited. Ethnic and political unrest has continued throughout the 1990s.

Competition for oil wealth has fueled violence between innumerable ethnic groups, causing the militarization of nearly the entire region by ethnic militia groups as well as Nigerian military and police forces. There have been many examples of corporate influence of the Nigerian military repressing protestors. On a bad day, more than 200,000 barrels of oil are stolen by militant gangs, who ferry it out to tankers plying their illegal trade on the high seas. The proceeds, which by some accounts may now run beyond \$10 billion USD a year have a corrupting effect on security services and institutions. A military group called the Movement for the Emancipation of Niger Delta (MEND) had become increasingly powerful. There is widespread fear of that MEND will blow up pipelines of oil giants such as Royal Dutch Shell, ExxonMobil and Chevron, antagonizing these foreign investors. In fact, in June 2008, speedboat riding gunmen navigated more than 100 km of open sea in darkness to attack Shell's giant Bonga vessel, forcing the company to shut 200,000 bpd of oil production and shattering the hopes that Nigeria's deepwater arena would be immune to the violence plaguing operations onshore.¹⁵

Despite billions of dollars in investment under the former government of Olusegun Obasanjo there is scarcely more electricity in 2008 than there was 10 years ago on the national grid, which by some estimates meets only 5% of potential demand.¹⁶

Hence, in spite of some positive indicators, Nigeria still suffers from many socio-economic issues that could reverse much of the last decade's progress.

Oil and Gas Industry in the Niger Delta

In 1997, Nigeria's proven oil reserves measured approximately 16.8 billion barrels and gas reserves were 3.3 trillion cubic metres, which represented 1.6% and 2.2% of the world's total reserves. In 2007, Nigeria had proven reserves of approximately 36 billion barrels.¹⁷ This phenomenal growth is being fueled by recent large deepwater discoveries. Approximately, 65% of Nigeria's crude oil production is light and sweet (low sulphur content).

Nigeria's largest oil reserves are believed to be in the Niger Delta. Oil was first struck at Oliobiri in the Niger Delta in 1956, and oil production has increased from a modest 5100 bpd to well above 2.5 mmbpd in 2006.¹⁸ The Niger Delta is located in the Atlantic Coast of southern Nigeria where the River Niger splits into many tributaries. It is the second largest delta in the world with a coastline of around 450 km ending at the Imo River entrance. It is an area of great cultural diversity; there are more than 40 ethnic groups in the region, speaking around 250 dialects. The region is comprised of small fishing villages and major export states.

Initially, companies were unwilling to exploit oil in Nigeria because there was no domestic market for gas and profit margins were low. However, in the 1990s, the Nigerian government gave the oil companies favorable fiscal incentives for oil exploitation. Nigeria became a very attractive target for oil exploration and production companies because of factors such as the low cost of exploration and production, size and number of unapprised discoveries, and the preferred quality of the Nigerian oil.¹⁹ The Nigerian National Oil Corporation (NNOC) was established in 1971 to ensure the government's participation in oil exploration and production. The NNOC set up joint ventures with foreign companies to tap into the country's potential oil and gas reserves. Despite the fact that foreign companies operate the joint ventures with a minority shareholding, these companies have effective control over daily operations. By 1979, the government had acquired a 60% partnership in all major foreign oil companies. For example, the government had a 35% share in one of the earliest oil exploration Shell-BP venture in 1973, and by 1979 the government's share had increased to 60%.²⁰

Oil revenue has propped up the government budget since the 1970s. According to Nigerian officials, oil revenue accounted for 80% of total federally collected revenue. With the displacement of the agricultural sector, Nigeria's economy became exclusively dependent on a single commodity - crude oil. Dependence on oil exposed Nigeria to fluctuations in the international oil market. In the first quarter of 1998, Nigeria lost \$700 million USD as a result of a global dip in oil prices.²¹ Problems were exacerbated due to the existing corruption among government officials who benefit from private deals with oil companies.

Every day in southern Nigeria, almost 2 million cubic feet of natural gas is burnt during crude oil production, more than anywhere else in the world. Gas flaring not only wastes a

valuable resource, but is a major cause of environmental pollution in the Niger River Delta. In the late 1980s the government made stringent gas monetization policies which made gas flaring an unlawful practice and set the year 2009 as the starting point for the full enforcement of “zero flare”.²² However, nothing has been done until today to stop gas flaring and this has led to further trouble and violence within the region. Local inhabitants have attributed high incidences of asthma, bronchitis, and skin and breathing problems to oil production activities, especially gas flaring and crude oil spillage.²³

The majority of the population of unemployed graduates, technicians, and artisans engage in criminal activities, including armed theft of crude oil and taking hostages. It was estimated that in 2007 over 1,000 deaths have been caused by the oil dispute along with 300 other kidnapping cases. In addition to the human sacrifices, oil exports have been cut by 25% during the past few years and attacks and spillages have cost an estimated \$20.7 billion.²⁴ Border disputes are common; Nigeria is currently in dispute with both Cameroon and Equatorial Guinea relating to oil finds in the Gulf of Guinea. Cameroon and Nigeria each claim the Bakassi Peninsula located in the Gulf of Guinea and which is believed to contain significant reserves of oil. As a result, local groups have sabotaged and interfered with foreign oil companies.²⁵

Recently, oil exploration activities have shifted to the deep water offshore of the Niger Delta. Offshore activities have intensified in recent years and have accounted for over 50% of oil production in Nigeria. The deepwater extraction plants are less disturbed by local militant attacks, seizures due to civil conflicts, and sabotage. One significant deepwater discovery is the Agbami field that holds more than 1 billion barrels of reserves and ranks among the single largest deepwater discoveries in the world.

Agbami

The Agbami field is located 70 miles off of the Nigerian coastline and is approximately 5000 feet in depth. It is owned by Chevron, Star Deep (affiliate of Chevron Texaco), Famfa, and Petrobras. By 2007, the Agbami field had become widely researched. The field housed the largest FPSO (Floating Production Storage Offloading vessel)--the key vessel through which all production-stage activities take place in deepwater--in the world.²⁶ It was the largest deepwater project yet in Nigeria, and an impressive example of mobilizing thousands of people from several different countries to achieve a goal.

Further, the project had been a massive success in "Nigerian Content", a government mandate that began during the 1990s whereby companies partaking in large-scale projects were expected to involve the local community through employing Nigerians and their respective businesses in order to stimulate economic growth.²⁷ Petrobras and its Agbami partners took this mandate to new levels and sought a target of 50% beyond that of previous projects.²⁸ The project related to FPSO construction alone involved technical training for over 100 Nigerian engineers, representing 20 local companies. By mid-year 2008, over 1300 people from various countries were regularly employed at the Agbami site. All employees were trained at a campus-like facility outside of Lagos, where staff studied basic business skills as well as technical ones. Many technical employees then spent time in Korea (where the FPSO was built) training with the FPSO equipment.²⁹

Petrobras at Agbami

Petrobras's entrance into the region began with investments in the Agbami and Akpo fields off of the Niger Delta. Contracts in Agbami consisted of OPL (oil prospecting license) 216. Partners NNPC, Star Deep, and Famfa won the initial contract and later brought in Petrobras for its expertise and experience in deep water. The ownership was as follows: NNPC--Nigerian National Petroleum Corporation (50 percent); Star Deep (32 percent); Famfa (10 percent) and Petrobras (8 percent).³⁰ In 2004, the OPL 216 was unitized with OPL 217 due to the structures and reserves shared between them. The partners and ownership structure then changed to the following: ChevronTexaco--68.15% (operator); Statoil 18.85% interest, Petrobras 13%.³¹ The firms were targeting first production in the field to occur by 2007.³²

In 2005, the companies solicited bids for the building of an FPSO. Daewoo won the bid for \$1.1 billion and the ship arrived in 2007.³³ Meanwhile, in 2007 Petrobras recorded its highest earnings ever, with a profit of more than \$13 billion USD. The company was experiencing great growth throughout the world, yet it had spent nearly \$500 million in Nigeria's Agbami field and, as of June 2008, had yet to earn its first dollar of revenue. The FPSO had not yet come online and the field was still awaiting production. At the same time, the firm had just received an offer by Statoil to be bought out for \$1 billion USD.

David's Decision

As Passami paced around his office in Lagos, he knew that it was crucial to get an accurate picture of the valuation on this project. Several factors ran through his head--- drop in oil demand from the current recession, future oil prices, changes in government tax structure, terms of contract signed, partners involved--reputation and opportunities for future business, drilling costs, and the true production capacity of the field. Finally, there was the political and economic risk in the country. While the deepwater sites were typically less subject to local militant attacks and civil disruptions, the recent gunmen attack on Shell's giant Bonga vessel had proven that deepwater was not immune. David felt that he could factor some of this risk into the discount rate that he used; however, he felt that these issues were also necessary to consider in thinking about Petrobras's strategic direction in the region. Perhaps exiting Agbami was the first step towards exiting Nigeria. While he knew there was not time to think exhaustively about all of these factors, he was certain that it was necessary to give some consideration to each of them as he made this decision.

Oil Price Projections: David Passami looked at his Bloomberg terminal and saw that the prior day's (June 16, 2008) closing price of Brent Crude Oil was \$134.52. He also researched several projections for oil prices by different agencies and analysts. The Texas State Government expected the price to drop by the end of the year to \$67.83 (see Exhibit 7) and Goldman Sachs analysts predicted that the price of crude was going to continue with the momentum and settle at \$200 per barrel by the end of the year. There were strong arguments for both extremes of price projections. The Texas Government based its analysis on historical prices and Passami had used the Texas projections throughout his career. They predicted that the average price of crude was going to drop because of the

irrational increase in the price of crude--mostly based on speculation by hedge funds and other major market participants. However, Goldman based its projections on the rapid expansion in emerging markets, especially BRIC countries, and their appetite to consume oil exponentially and fuel their growth to over 8% per annum. The futures price (which has been fluctuating severely in recent months) indicated that the price of oil will stay flat or increase modestly (see Exhibit 7). David strongly believed that the futures price was a reasonable alternative to the forecasts of both the Texas State Government and Goldman, since global markets tended to be efficient and accurate predictors of future price.

The spike in oil prices coincided with a dollar slump, plummeting share prices on Wall Street and rising US unemployment - the biggest rise in 20 years. Last week, the U.S. Labor Department reported that American employers axed 49,000 jobs in May, the fifth straight month of job losses, an event that signals a recession. Passami had followed the Dow Jones Industrial Average which had declined by 394-points post the unemployment news. Harry Tchilinguirian, an oil analyst at BNP Paribas in London, had said "World oil demand growth is still accounted mostly by China, the Middle East and Latin America - and through the summer, there is no reason to expect a material slowdown in demand growth in these areas."³⁴ However, Passami knew that a severe U.S. recession could lead to a global recession, which would have a negative long-term impact on the demand for oil. This would directly affect Petrobras's revenues from the Agbami area.

Taxes and Royalties: Taxes and royalties in the oil industry are calculated quite differently from those of other industries. Since production of oil is primarily depletion of a country's natural resources, the governments demand a high premium. As shown in Exhibit 8, in Nigeria, the government collects an 18.5% royalty on gross oil production. In addition, the government also collects an 85% tax on profits generated by the oil projects. This tax is enforced on all profits remaining after deducting operating, capital expenditures and a 16% profit allowance for oil firms. See Exhibit 8 for sample calculations on taxes and royalties. While Passami had a strong grasp on these calculations, he knew they were potentially subject to change in the future.

The Nigerian country had gone through a lot of uncertainties in the past, including a civil war. What if a new government took control of the country? If this occurred, it is highly likely that there would be a change in either the Royalty or Tax rates, or both. Already, voices of concern were raised by some factions of the present government and other political organizations about the current royalty rate of 18.5% (for offshore). These groups strongly believed that the foreign governments and corporations were exploiting Nigeria's precious resources of high quality crude oil for a meager 18.5% royalty rate. Additionally, certain factions believed that the United States government, in collusion with other developed economies, was keeping the price of crude at artificially low prices. Passami believed that in one of the extreme scenarios the royalty could be increased to around 50%, in a government attempt to capture their fair share. Although this would discourage foreign corporations from investing in Nigeria, the short-sightedness of these groups was a large concern for Petrobras.

The potential political instability could also mean that Petrobras's assets could be frozen and the \$500 million cash reserve in the Central Bank of Nigeria could be either seized or forbidden to be taken out of the country (similar to the strict conditions imposed by the

Venezuelan government). For the purposes of the valuation, Passami would account for this risk in the discount rate (See exhibit 10).

Relationships: Under the terms of Petrobras's production sharing agreement (PSA) with its partners--Chevron, Statoil, and the Nigerian National Petroleum Company--a company could exit their investment so long as they sold out to an existing partner. Thus, Passami knew that it was acceptable to exit, but still felt that Petrobras's reputation was at stake and knew these relationships were important. In addition, Petrobras had been establishing itself as a premiere player in deepwater production. And particularly as a smaller player (in terms of overall assets) among its peers, this reputation was critical for Petrobras getting a piece of the action at some of the landmark locations around the world. David pored over the latest report on World Deepwater Reserves (see exhibit 11) and wondered for how many new projects Exxon or another large player such as BP might call on Petrobras's expertise after it had proven itself at Agbami. After all, Petrobras had not bid on the initial concession (OPL 216), but was brought in later as a partner due to its expertise. While it was difficult for David to quantify the value of these relationships in the future, he felt that there should be some premium associated with this which would increase the value of its stake in Agbami.

Production Capacity: David also had to consider the production capacity of the field. At present, the field was projected to have a total of one billion barrels in oil reserves. This number had been ascertained through nearly 10 years of seismological studies and prospective drilling, yet David knew that the numbers often changed once production began and the wells actually flowed. Current projections showed an initial daily capacity (first year) of 175,000 barrels and an annual capacity of 91,250,000. He felt that it was reasonable to also look at a low production scenario, where the field operated at 85% of current capacity, and an optimistic scenario where the field operated at 115% of capacity (see exhibit 9).

Drilling Costs: By the end of May, 2008, the partners had used one rig to drill 16 wells. Estimates were that it would require a total of 38 wells to tap the resources of the entire field. While this drilling was accounted for in David's cost assumptions (See exhibit 6) he knew that drilling costs often varied once a drill began. Recent data only supported this suspicion--due to a supply shortage for deepwater drilling rigs, the daily price for a rig had risen from \$450,000 a year earlier to over \$500,000 today. And this was only being pushed upward further by the decreasing returns from onshore energy fields and the currently high oil prices.³⁵ Since drilling costs would ultimately represent a substantial portion of total fixed and variable costs for the project, David knew this was a crucial input into his valuation. He felt that a conservative assumption would be a 20% increase in costs ("exploration expenses" in exhibit 6) over the current 2009 projection, then a 20% growth rate over each of the following 3 years. However, by 2013, David felt the increases would taper off (based on the current schedule) as drilling needs subsided.

Political Risk: Finally, David was well aware of the current political and economic uncertainties in Nigeria. He was concerned by the increasing violence caused by the MEND and believed that the slightest provocation could end the tentative peace that exists in the region. The recent attacks on Shell's Bonga vessel had caused them to shut down production of around 200,000 barrels of crude per day.

For these reasons, it wasn't certain that Petrobras would want to remain in Nigeria into the future. Yet, this decision was far from clear cut—since the Brazilian government was a 56% shareholder in Petrobras, Passami had to consider Brazil's foreign policy and its ties to Nigeria as a trading partner. The two countries had had excellent relations for several centuries. In fact, many Afro-Brazilians could trace their roots to Nigeria. Further, Lula da Silva, Brazil's President, had a major directive to “strengthen bilateral and multilateral relations in order to increase the country's weight in political and economic negotiations,” and the focus of this was placed on emerging markets such as Nigeria.³⁶

This information notwithstanding, if Petrobras did in fact want to exit Nigeria, David reasoned that he may recommend that Petrobras consider an offer price of up to 10% below that of the true value of its stake in Agbami.

Case Questions—

1. a. What is a fair valuation of the Agbami project? (Include a sensitivity analysis examining changes in the following inputs: oil price, royalty, taxes, production capacity, drilling cost, and cost of capital)
- b. What is the breakeven oil price for the Agbami field?
2. Should Petrobras sell its stake to Statoil? If so, at what price?

Exhibit 1: Top countries for oil production, consumption and proved reserves

Top Oil Producers in 2008	Production Capacity ('000 barrels/day)	Top Oil Producers in 1998	Production Capacity ('000 barrels/day)
Saudi Arabia	10782	Saudi Arabia	9472
Russia	9790	United States	9278
United States	8514	Russia	6070
Iran	4174	Iran	3703
China	3973	Mexico	3501
Canada	3350	Venezuela	3409
Mexico	3186	China	3302
United Arab Emirates	3046	Norway	3147
Kuwait	2741	United Kingdom	2918
Venezuela	2643	Canada	2700
Norway	2486	United Arab Emirates	2519
Brazil	2402	Kuwait	2206
Iraq	2385	Iraq	2162
Algeria	2180	Nigeria	2160
Nigeria	2169	Indonesia	1616

Top Oil Consumers in 2008	Consumption ('000 barrels/day)	Top Oil Consumers in 1998	Consumption ('000 barrels/day)
United States	19498	United States	18917
China	7831	Japan	5507
Japan	4785	China	4106
India	2962	Germany	2923
Russia	2916	Russia	2489
Germany	2589	Brazil	2096
Brazil	2485	France	2043
Saudi Arabia	2376	Canada	1949
Canada	2261	Mexico	1949
South Korea	2175	Italy	1943
Mexico	2128	Korea, South	1917
France	1986	India	1844
Iran	1741	United Kingdom	1792
United Kingdom	1710	Saudi Arabia	1439
Italy	1639	Spain	1356

Exhibit 1 (Continued): Top countries for oil production, consumption and proved reserves

Country	Proved Reserves in 2008 (billions of barrels)	Country	Proved Reserves in 1998 (billions of barrels)
Saudi Arabia	267	Saudi Arabia	262
Canada	179	Iraq	113
Iran	138	United Arab Emirates	98
Iraq	115	Kuwait	97
Kuwait	104	Iran	93
United Arab Emirates	98	Venezuela	72
Venezuela	87	Russia	49
Russia	60	Mexico	40
Libya	41	Libya	30
Nigeria	36	China	24
Kazakhstan	30	United States	23
United States	21	Nigeria	17
China	16	Norway	10
Qatar	15	Algeria	9
Europe	14	Kazakhstan	5

Source: <http://tonto.eia.doe.gov/country/index.cfm>

Exhibit 2: Nigeria Profile Overview (as of 2008)

Area	923,768 sq km (356,700 sq miles)
Credit Agencies	S&P: B+ Fitch: BB-
Population	149.3 Mn
Nominal GDP	\$157.2 Bn
GNI per capita	US \$1,160 (World Bank, 2008)
Capital City	Abuja (6 million)
Other Major Cities	Lagos, Ibadan, Kano and at least 7 other cities with a population of over 1 million
Language(s)	English (official) but Hausa, Yoruba, Igbo are also used in the National Assembly
Religion(s)	Muslim, Christian and traditional
Currency	Naira (NGN)
Major political parties	Peoples Democratic Party (PDP), All Nigeria Peoples Party (ANPP), Action Congress (AC)
Head of State	President Umaru Yar'Adua (inaugurated 29 May 2007)
Vice-President	Goodluck Jonathan
Main exports	Petroleum, petroleum products, cocoa, rubber
Natural resources	Petroleum, natural gas, tin, columbite, iron ore, coal, limestone, lead, zinc.
Agriculture products	Cocoa, peanuts, palm oil, corn, rice, sorghum, millet, cassava (tapioca), yams, rubber; cattle, sheep, goats, pigs; timber; fish.
Industries	Crude oil, coal, tin, columbite, palm oil, peanuts, cotton, rubber, wood, hides and skins, textiles, cement and other construction materials, food products, footwear, chemicals, fertilizer, printing, ceramics, steel.
Exports partners	USA 38.3%, India 9.9%, Brazil 6.8%, Spain 6.2%, France 5.6%, Japan 4% (2003)
Natural resources	Petroleum, natural gas, tin, columbite, iron ore, coal, limestone, lead, zinc.
Imports partners	USA 15.6%, UK 9.6%, Germany 7.3%, China 7.2%, Italy 4.3% (2003)

Source: http://news.bbc.co.uk/2/hi/africa/country_profiles/1064557.stm

Exhibit 3: Important Economic Forecasts of Nigeria

Economic Indicators				
	03-08 avg.	2009	2010	2011
GDP (% growth, real)	7.1	4.5	5.5	5.0
Inflation (%chg, pa avg.)	11.5	12.5	10.5	9.1
Fiscal Balance (% of GDP)	0.6	-4.0	-4.8	-4.0
Exports (% comp. annual growth)	26.7	-38.7	27.3	-0.3
Imports (% comp. annual growth)	16.3	-7.8	12.5	13.3
Current Account (% of GDP)	23.5	7.4	11.1	7.1
Reserves (months of imports)	10.4	10.5	10.9	10.8
External Debt (% of GDP)	15.8	6.2	6.5	6.3
Debt Service Ratio (due)	6.4	0.5	0.5	0.7
Exchange Rate (to USD; eoy)	128.0	149.0	152.0	155.0

Source: EIU, EDC Economics

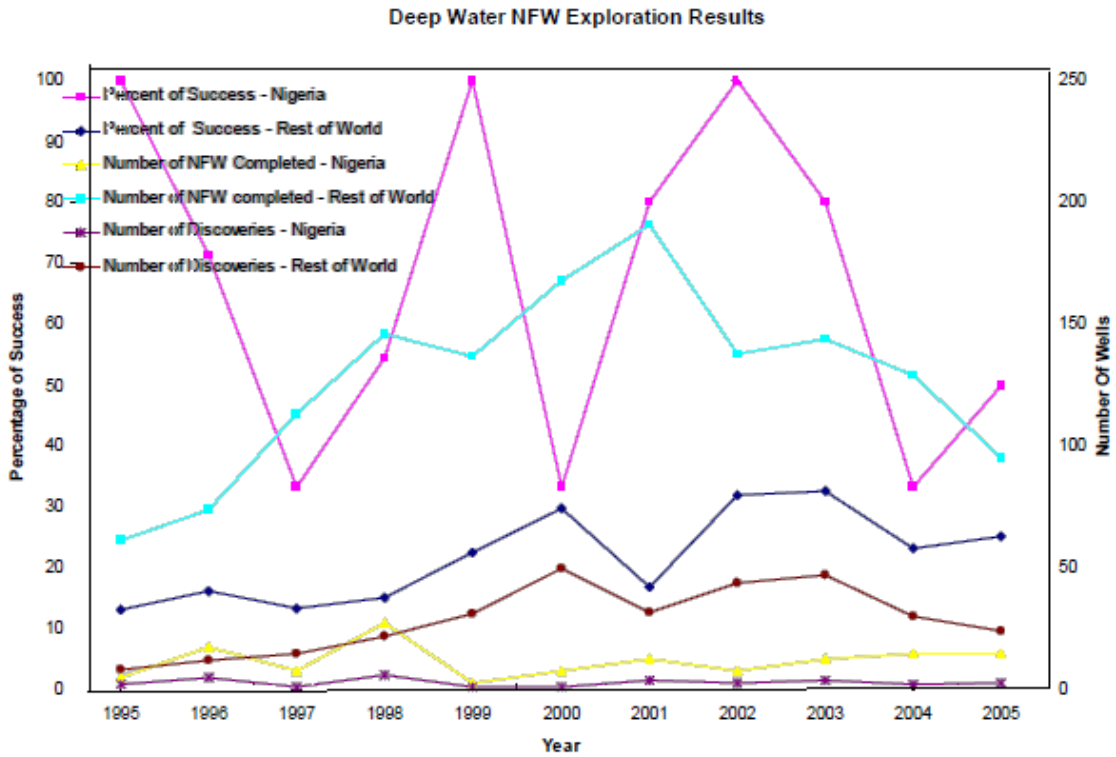
Source: www.edc.ca/english/docs/nigeria_e.pdf

Exhibit 4: Important timelines in history for Petrobras

1953	The company is created by president Getúlio Vargas.
1954-1961	The company faced opposition by the government.
1961	A report released by the government reveals pessimistic news about oil prospects in the country's terrains.
1973	The company's short period of growth was met by the first oil crisis. The crisis affected the country as a whole, as the "Brazilian miracle", fast growth in the national economy, came to a halt. The company itself almost faced bankruptcy.
1974	Petrobras discovered a huge oil field in Bacia de Campos, which oil reserves raise the company's finances, "resurrecting" its operations nationwide.
1975	The company signed "risk contracts" of partnership with private oil companies to intensify the search for new oil fields and to consolidate its influences in the country.
1979	Petrobras was affected by second oil crisis, but the effect was not as strong as it had been in the crisis of 1973.
1997	The government approved Law N. 9.478, essentially breaking the company's monopoly in Brazil and allowing competitors to develop the country's oil fields. Petrobras also reached the mark of producing one million barrels per day. The company executed agreements with other Latin American governments and began operations outside of Brazilian domains.
2000	The company reached the world record of oil exploration in deep waters, at 1,877 meters below sea level.
2001	An accident occurred at the P-36 Platform, which was the world's biggest oil platform. The platform, owing to technical failures, sank on 20 May with about 1500 tons of oil.
2003	The company acquired Argentina's largest oil company Perez Companc Energía (PECOM Energía S.A.), and its operational bases in Bolivia, Peru and Paraguay.
2006	Petrobras achieved Brazilian self-sufficiency in oil.
2007	The company recorded its highest earnings ever, with more than US\$13 billion of profit. The company announced the discovery of the giant oil field "Jupiter", in Santos. Value of the company's shares increased by about 106%, from February to December.
2008	The company discovered what could be the world's third largest oil field. The actual reserves are yet to be verified, however.

Source: <http://en.wikipedia.org/wiki/Petrobras>

Exhibit 5: Percentage of success in deep water exploration in Nigeria compared to the rest of the world.



Source: "ANGOLA – NIGERIA: TWO GIANTS OF SUB-SAHARAN AFRICA" July 2007 Andrew Hayman
<http://energy.ihs.com/NR/rdonlyres/CD6B101F-89AC-4A57-B08B-10F95D81DD52/0/AngolaNigeriaAH.pdf>



FUQ-04-2010
Original: April 10, 2010

Exhibit 6: Projected Income statement for the Agbami project

All numbers are in \$ MM

	Fiscal Year Ended December																
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Sales	4332.64	6236.03	6315.41	6404.84	6529.85	6161.48	5777.74	5385.86	4967.30	4523.19	4048.69	3550.33	3024.94	2473.86	1893.93	1286.06	655.53
Royalty at 18.5%	801.54	1153.66	1168.35	1184.89	1208.02	1139.87	1068.88	996.38	918.95	836.79	749.01	656.81	559.61	457.66	350.38	237.92	121.27
Total revenue	3531.10	5082.36	5147.06	5219.94	5321.83	5021.61	4708.86	4389.47	4048.35	3686.40	3299.68	2893.52	2465.32	2016.19	1543.55	1048.14	534.25
Production expense excl. taxes	(366.76)	(527.88)	(534.60)	(542.17)	(552.76)	(521.57)	(489.09)	(455.92)	(420.49)	(382.89)	(342.72)	(300.54)	(256.06)	(209.41)	(160.32)	(108.87)	(55.49)
Gross Profit	3164.34	4554.48	4612.46	4677.77	4769.07	4500.03	4219.77	3933.56	3627.86	3303.51	2956.96	2592.98	2209.26	1806.78	1383.23	939.28	478.76
Taxes other than on income	(20.15)	(29.00)	(29.37)	(29.78)	(30.36)	(28.65)	(26.87)	(25.04)	(23.10)	(21.03)	(18.83)	(16.51)	(14.07)	(11.50)	(8.81)	(5.98)	(3.05)
Proved producing properties																	
Depreciation & depletion	(265.61)	(382.30)	(387.17)	(392.65)	(400.31)	(377.73)	(354.21)	(330.18)	(304.52)	(277.30)	(248.21)	(217.65)	(185.44)	(151.66)	(116.11)	(78.84)	(40.19)
Accretion expense	(13.57)	(19.53)	(19.78)	(20.06)	(20.45)	(19.30)	(18.09)	(16.87)	(15.56)	(14.17)	(12.68)	(11.12)	(9.47)	(7.75)	(5.93)	(4.03)	(2.05)
Exploration expenses	(109.78)	(158.01)	(160.02)	(162.29)	(165.46)	(156.12)	(146.40)	(136.47)	(125.86)	(114.61)	(102.59)	(89.96)	(76.65)	(62.68)	(47.99)	(32.59)	(16.61)
Unproved properties valuation	(4.93)	(7.10)	(7.19)	(7.29)	(7.44)	(7.02)	(6.58)	(6.13)	(5.66)	(5.15)	(4.61)	(4.04)	(3.44)	(2.82)	(2.16)	(1.46)	(0.75)
Other income (expense)	(183.79)	(264.53)	(267.90)	(271.69)	(277.00)	(261.37)	(245.09)	(228.47)	(210.71)	(191.87)	(171.75)	(150.61)	(128.32)	(104.94)	(80.34)	(54.56)	(27.81)
Earnings before Taxes	2566.50	3694.00	3741.03	3794.00	3868.05	3649.85	3422.53	3190.39	2942.45	2679.38	2398.30	2103.09	1791.87	1465.43	1121.90	761.82	388.31
Profit Allowance (@16%)	410.64	591.04	598.56	607.04	618.89	583.98	547.60	510.46	470.79	428.70	383.73	336.49	286.70	234.47	179.50	121.89	62.13
Results before income taxes	2155.86	3102.96	3142.46	3186.96	3249.17	3065.87	2874.93	2679.93	2471.66	2250.68	2014.57	1766.59	1505.17	1230.96	942.39	639.93	326.18
Income tax expense	(1832.48)	(2637.52)	(2671.09)	(2708.92)	(2761.79)	(2605.99)	(2443.69)	(2277.94)	(2100.91)	(1913.08)	(1712.39)	(1501.61)	(1279.39)	(1046.31)	(801.03)	(543.94)	(277.25)
Additional earnings	323.38	465.44	471.37	478.04	487.37	459.88	431.24	401.99	370.75	337.60	302.19	264.99	225.78	184.64	141.36	95.99	48.93

Exhibit 7: Forecasted Oil Prices

Year	Option 1 (Texas State Government)	Option 2 (Futures Price)	Option 3 (Average Price)
1	67.83	134.61	101.22
2	68.34	136.25	102.30
3	69.21	135.23	102.22
4	70.19	135.00	102.60
5	71.56	135.24	103.40
6	73.15	135.70	104.43
7	74.83	136.40	105.62
8	76.73	137.15	106.94
9	78.63	138.00	108.32
10	80.55	140.07	110.31
11	82.40	142.17	112.29
12	84.30	144.30	114.30
13	86.19	146.47	116.33
14	88.11	148.67	118.39
15	89.94	150.90	120.42
16	91.61	153.16	122.38
17	93.39	155.46	124.42

Exhibit 8: Sample calculations on Taxes and Royalty

Gross Revenue	\$100
Royalty (@18.5%)	(\$18.50)
Depreciation (say 10%)	(\$10)
Capex (say 10%)	(\$10)
EBIT	\$61.50
Profit Allowance (@ 16%)	(\$9.84)
EBT	\$51.66
Taxes (@85%)	(\$43.91)
Net Profit	\$7.75

Note: Net Profit earned by the firm is in addition to the Profit Allowance

Exhibit 9: Production Schedule for Agbami

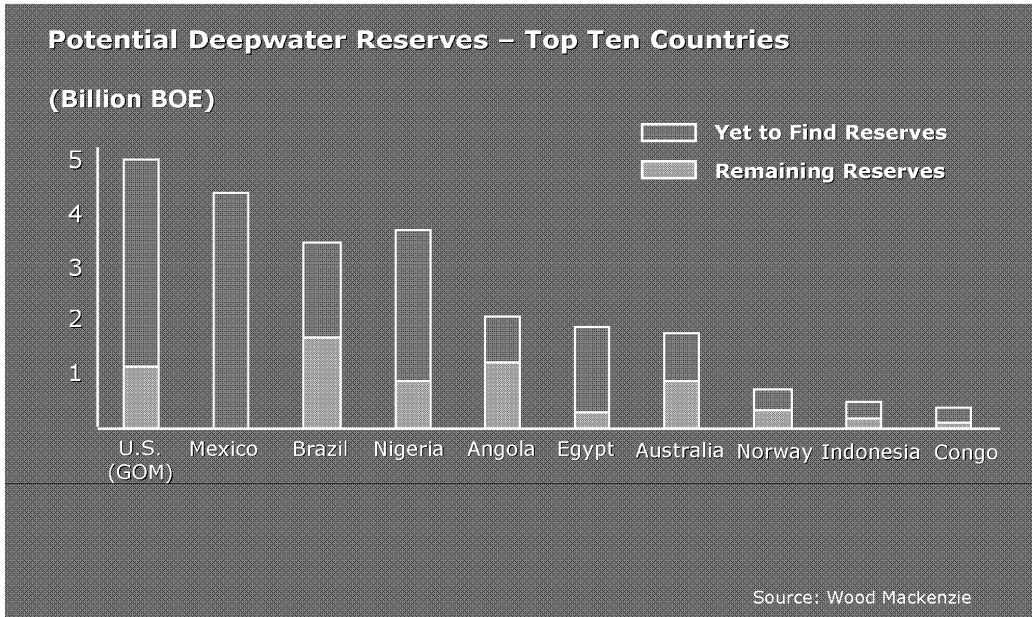
Year	Production Capacity (barrels per day)	Production Capacity (barrels per	Capacity Utilization	Actual Production	Price of Crude per barrel	Revenue (\$ MM)
1	175,000	63,875,000	100%	63,875,000	\$ 67.83	\$ 4,333
2	250,000	91,250,000	100%	91,250,000	\$ 68.34	\$ 6,236
3	250,000	91,250,000	100%	91,250,000	\$ 69.21	\$ 6,315
4	250,000	91,250,000	100%	91,250,000	\$ 70.19	\$ 6,405
5	250,000	91,250,000	100%	91,250,000	\$ 71.56	\$ 6,530
6	230,769	84,230,769	100%	84,230,769	\$ 73.15	\$ 6,161
7	211,538	77,211,538	100%	77,211,538	\$ 74.83	\$ 5,778
8	192,308	70,192,308	100%	70,192,308	\$ 76.73	\$ 5,386
9	173,077	63,173,077	100%	63,173,077	\$ 78.63	\$ 4,967
10	153,846	56,153,846	100%	56,153,846	\$ 80.55	\$ 4,523
11	134,615	49,134,615	100%	49,134,615	\$ 82.40	\$ 4,049
12	115,385	42,115,385	100%	42,115,385	\$ 84.30	\$ 3,550
13	96,154	35,096,154	100%	35,096,154	\$ 86.19	\$ 3,025
14	76,923	28,076,923	100%	28,076,923	\$ 88.11	\$ 2,474
15	57,692	21,057,692	100%	21,057,692	\$ 89.94	\$ 1,894
16	38,462	14,038,462	100%	14,038,462	\$ 91.61	\$ 1,286
17	19,231	7,019,231	100%	7,019,231	\$ 93.39	\$ 656

Exhibit 10: Key Risks to be considered while calculating the cost of capital

General Risks	Specific Risks
<i>Sovereign</i> Currency	Direct currency risk: Exchange rate and currency fluctuations can directly impact the value of goods and services sold. Indirect currency risk: Macroeconomic policies can cause the local currency to devalue which has a secondary effect. Massive devaluation can cause major unrest in the country.
Expropriation	Direct: The government can seize assets Diversion: The government can divert exports Creeping: The government can alter its taxation policies
Commercial International partners	Are any international partners involved in this project that lend credibility to the project and that could give Petrobras and Agbami a stronger hold in the region?
Involvement of Multilateral Agencies	Is any multilateral agency involved in the project which lends support to the project and benefits from the project proceeding smoothly?
Sensitivity of Project to wars, strikes, terrorism	Sensitivity of the project to civil unrest and strikes that could affect the ability of employees to carry on their daily work. One way to think about this is, is this project more sensitive to war and terrorism than other projects undertaken in Nigeria?
Sensitivity of Project to natural disasters	Natural disasters are unexpected sudden events which impacts with such severity that it is usually disastrous and uncontrollable.
<i>Operating</i> Resource	Resources include availability of inputs and raw materials required for production.
Technology	Technology refers to the technological challenges required for ongoing and sustained production.
<i>Financial</i> Probability of default	Default refers to the inability to make debt payments or to come up with adequate financing for completion of a project.
Political risk insurance	Political risk insurance is a type of insurance that can be taken out by businesses, of any size, against political risk — the risk that revolution or other political conditions will result in a loss.

Exhibit 11: World Deepwater Oil Reserves

World's Deepwater Basins Provide Attractive Opportunities



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Source: <http://www.slideshare.net/finance1/chevron-credit-suisse-2008-offshore-technology-conference>

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