

CASE 2

Petrobras in Nigeria: Valuation of the Agbami Oil Field

DESCRIPTION

The case describes a sell-out decision faced by the Vice President of Petrobras, a Brazilian multinational, in Nigeria. Petrobras had already invested \$500 m in the past ten years in the project and was yet to receive a nickel. The company had received an offer from Statoil, a partner in the project, to purchase its stake. Students are asked to value Petrobras' stake in the project.

LEARNING OBJECTIVE

To introduce issues in valuation of natural resource investments, especially in emerging markets.

SUBJECTS COVERED

Financial Management, Valuation, Natural Resource Investments.

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

INTRODUCTION

By June 2008, Petrobras (PB) had spent 10 years and nearly \$500 million in Nigeria's Agbami field and was yet to receive a nickel from the project. 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 project in the world at the time, with an estimated 1 billion barrels of oil reserves. David Passami, the VP of Strategy for Petrobras Nigera, was charged with the difficult decision of whether or not to sell their stake in the field to Statoil, which had just made an offer to buy out their 13% stake at a price tag of \$1 billion.

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 Nigerian government, Famfa, a Nigerian oil company, and Chevron, the US oil giant. The issue was how PB's decision would impact future partnerships in Nigeria and other regions. After all, "in the international arena, rocks and relationships were the foundation for successful exploration".¹

PETROBRAS

Petrobras, short for *Petróleo Brasileiro*, 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

Over the previous 55 years, the company had grown tremendously. It was one of the biggest players in the deep-water oil exploration and the eighth largest oil and gas company in the world. The Brazilian government still owned 56% of common shares.

Petrobras began international exploration in the 1980s. Discoveries throughout the decade helped the company establish its expertise in deep-water exploration and production. In 1980, Petrobras discovered an oil field in Iraq, which became an important trading partner during the period. Concurrently, the company was drilling in Angola and in the Gulf of Mexico. The mid-1980s saw production in the deep-water 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

¹"The Path to Agbami: Stalking an African Giant", Bruce S Applebaum.

²PB website – investor relations

³WSJ – "Petrobras Celebrates 50 Years, Sets Sights on Self-Sufficiency."

⁴WSJ – "Petrobras Celebrates 50 Years, Sets Sights on Self-Sufficiency."

⁵Hoovers Online Pro - PETRÓLEO BRASILEIRO S.A. - PETROBRAS.

In 1997, when the 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 reorganise 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 (in which Petrobras was becoming an expert), the “sweet” quality of the oil in the region, and lower transportation costs from the region than the Middle East, due to the shorter distance between Nigeria and Brazil.⁷

Exhibit 1 presents milestones in the history of Petrobras. Exhibits 2 and 3 present Income Statement and Balance Sheet.

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 US began producing significant quantities of oil for commercial purposes.⁸ For much of the 19th and 20th centuries, these two countries produced most of the 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 US and other Western countries. The supply shortage increased the prices of oil by nearly four times. In 1979, fuelled 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 working 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 and 2, called upstream stages, oil reserves are identified, explored and extracted. In stages 3 and 4, called downstream stages, the crude oil is refined to extract various petroleum products and then transported to end-users.

Exhibit 4 presents the list of top oil producers, consumers and potential producers in the world.

⁶<http://en.wikipedia.org/wiki/Petrobras>.

⁷Email communication with Petrobras management.

⁸This section is based on the information in “Petroleum”, Encyclopædia Britannica, Eleventh Edition.

⁹<http://tonto.eia.doe.gov/country/index.cfm>.

COUNTRY BACKGROUND

Nigeria gained its independence from the UK on 1 October 1960. 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 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 a million lives, Nigeria re-achieved democracy in 1999 when it elected Olusegun Obasanjo, the former military head of state, as the new President. Umaru Musa Yar'Adua was elected in 2007.

Exhibit 5 presents a brief profile of Nigeria. Exhibit 6 presents forecast of economic indicators.

Historic Economic Events

Nigeria's oil-rich Niger Delta had been an important resource for the country. Nigeria joined the OPEC during the oil boom of the 1970s. Billions of dollars generated by oil production flowed into the coffers of the state. The oil sector provided 95% of foreign exchange earnings and 80% of budgetary revenues. However, increasing corruption at all levels of government siphoned off most of these earnings.¹¹ The oil boom benefited the northern military faction but not the Nigerian people. The Nigerian government, similar to prior military rulers, became increasingly dependent on oil revenues and failed to promote economic stability. Following the signing of an IMF standby 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 programme 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 modernisation of the banking system, curbing inflation by blocking excessive wage demands and resolving regional disputes over the distribution of earnings from the oil industry.

OIL AND GAS INDUSTRY IN THE NIGER DELTA

In 1997, Nigeria's proven oil reserves were estimated at 16.8 billion barrels and gas reserves at 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.¹³ This phenomenal growth was being fuelled by recent large deep-water discoveries. Approximately, 65% of Nigeria's crude oil production was light and sweet (low sulphur content).

¹⁰<http://www.wikipedia.com>, "Nigeria post-independence."

¹¹<http://www.wikipedia.com>, "Military Era in Nigeria."

¹²<http://www.wikipedia.com>, "Economy of Nigeria."

¹³<http://tonto.eia.doe.gov/country/index.cfm>.

Nigeria's largest oil reserves were believed to be in the Niger Delta. Oil was first struck at Oliobiri in the Niger Delta in 1956, and oil production had increased from a modest 5100 bpd to well above 2.5 mmbpd in 2006.¹⁴ The Niger Delta was located in the Atlantic Coast of southern Nigeria where the River Niger splits into many tributaries. It was the second largest delta in the world with a coastline of around 450 km ending at the Imo River entrance. It was an area of great cultural diversity; there were more than 40 ethnic groups in the region, speaking around 250 dialects. The region was 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 favourable fiscal incentives for oil exploitation. Nigeria became a very attractive target for oil exploration and production companies because of low cost of exploration and production, the size and number of unapprised discoveries, and the preferred quality of the Nigerian oil.¹⁵ The Nigerian National Oil Corporation (NNOC) was established in 1971 to ensure 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 operated the joint ventures with a minority shareholding, these companies had 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%.¹⁶

Oil revenue had 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 as a result of a global dip in oil prices.¹⁷ Problems were exacerbated due to the existing corruption among government officials who benefited from private deals with oil companies.

Every day in southern Nigeria, almost 2 million cubic feet of natural gas was burnt during crude oil production, more than anywhere else in the world. Gas flaring not only wasted a valuable resource, but was 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".¹⁸ However, nothing has been done until today to stop gas flaring and this has led to further trouble and violence within

¹⁴Pg. 54 "The political economy of oil and gas in Africa, The case of Nigeria" Soala Ariweriokuma.

¹⁵ Pg. 21 "Oil in Nigeria, conflict and litigation between oil companies and village communities" Jędrzej Georg Frynas.

¹⁶Pg. 32 "Oil in Nigeria, conflict and litigation between oil companies and village communities" Jędrzej Georg Frynas.

¹⁷"Oil-dependence and Civil conflict in Nigeria" Aderoju Oyefusi.

¹⁸Pg. 35 "The political economy of oil and gas in Africa, The case of Nigeria", Soala Ariweriokuma.

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.¹⁹

The majority of the population of unemployed graduates, technicians, and artisans engaged in criminal activities, including armed theft of crude oil and taking hostages. It was estimated that in 2007, over 1,000 deaths had been caused by the oil dispute along with 300 other kidnapping cases. In addition to the human sacrifices, oil exports had been cut by 25% during the past few years and attacks and spillages had cost an estimated \$20.7 billion.²⁰ Border disputes were common; Nigeria was in dispute with both Cameroon and Equatorial Guinea relating to oil finds in the Gulf of Guinea. Cameroon and Nigeria each claimed the Bakassi Peninsula located in the Gulf of Guinea, which was believed to contain significant reserves of oil. As a result, local groups had sabotaged and interfered with foreign oil companies.²¹

Recently, oil exploration activities had shifted to the deep-water offshore of the Niger Delta. Offshore activities had intensified in recent years and accounted for over 50% of oil production in Nigeria. The deep-water extraction plants were less disturbed by local militant attacks, seizures due to civil conflicts, and sabotage. One significant deep-water discovery was the Agbami field that had more than 1 billion barrels of reserves and ranked among the single-largest deep-water discoveries in the world. In general, Nigeria experienced much greater success in deep-water offshore exploration compared to rest of the world (Exhibit 7).

AGBAMI

The Agbami field was located 70 miles off of the Nigerian coastline and was approximately 5000 feet in depth. It was 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.²² 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 growth²³. Petrobras and its Agbami partners took this mandate to new levels and sought a target of 50% beyond that of previous projects.²⁴ The project related to FPSO construction

¹⁹ Gas Flaring in Nigeria, http://www.foe.co.uk/resource/reports/gas_flaring_nigeria.pdf

²⁰ “Nigeria oil unrest ‘kills 1,000’”, <http://news.bbc.co.uk/2/hi/africa/7994152.stm>

²¹ <http://www.mbendi.com/indy/oilg/af/ng/p0005.htm>

²² “Sailaway of World’s Largest FPSO—Agbami from Okpo, Korea”, <http://www.pclsg.com/poshsemco.com.sg/news/02oct07.html>

²³ “Mike Oduniyi And Onyebuchi Ezigb, Daewoo Wins Contract to Build Agbami FPSO”, http://www.rigzone.com/news/article.asp?a_id=20570

²⁴ Pg. 2, “Agbami Project: People and Partnerships Delivering a World Scale Field Development”, Craig D. Bloomer.

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 as well as technical skills. Many technical employees then spent time in Korea (where the FPSO was built) training with the FPSO equipment.²⁵

PETROBRAS AT AGBAMI

Petrobras' 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) held 50 per cent; Star Deep held 32 per cent; Famfa held 10 per cent and Petrobras held 8 per cent.²⁶ In 2004, the OPL 216 was unitised 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%.²⁷ The firms were targeting first production in the field to occur by 2007.²⁸ 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 2007.²⁹ Exhibit 8 presents the projected income statement for Agbami.

Meanwhile, in 2007, Petrobras recorded its highest earnings ever, with a profit of more than \$13 billion. The company was experiencing high growth throughout the world, yet it had spent nearly \$500 million in Nigeria's Agbami field and, as of June 2008, was 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 buy its stake for \$1 billion.

THE SITUATION IN 2008

With oil prices soaring above \$100 a barrel, it seemed as though Nigeria was now economically secure (see Exhibit 9).³⁰ The country had successfully dealt with many of the political and economic issues

²⁵Pg. 8, "Agbami Project: People and Partnerships Delivering a World Scale Field Development", Craig D. Bloomer.

²⁶"ChevronTexaco Confirms Partner Agreement on Nigeria Deepwater Block OPL 216", http://investor.chevron.com/phoenix.zhtml?c=130102&p=irol-newsArticle_Print&ID=430894&highlight=

²⁷Petroleum Economist, "Statoil, a participant in the deep-water Agbami field, says the field—straddling the OPL216 and OPL217 licenses—has been unitized to give shares of ChevronTexaco (operator) 68.15%, Statoil, 18.85%, and Petrobras, 13%.(Nigeria)(Brief Article), <http://www.petroleum-economist.com/default.asp?Page=14&PUBID=46&ISS=11077&SID=437974>

²⁸ "ChevronTexaco Confirms Partner Agreement on Nigeria Deepwater Block OPL 216", http://investor.chevron.com/phoenix.zhtml?c=130102&p=irol-newsArticle_Print&ID=430894&highlight=

²⁹"Daewoo Wins Contract to Build Agbami FPSO", http://www.rigzone.com/news/article.asp?a_id=20570http://www.rigzone.com/news/article.asp?a_id=20570

³⁰ "Heady excitement dampened by doubt" by William Wallis and Matthew Green, Published: June 23 2008 17:47, www.financialtimes.com

it faced. Nigeria had written off its sizable external debt and foreign reserves had expanded more than 10 times in recent years: \$55 billion in oil earnings had flowed into the treasury in 2007 with an estimated \$76 billion expected in 2008. Though Nigeria had so far survived its own elections, the political and electoral system was still held hostage by corrupt members of the political elite. Within the economy, there existed growing resentment and discontent caused by massive regional imbalances and growing inequality between the rich and the poor. Adding to anxiety in political circles was speculation about the health of the President, Umaru Yar'Adua, who suffered 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 was still pending and there was ample reason for Nigeria's political schemers that could lead to political upheaval between different factions.³¹ Agitation for better resource control in the Niger Delta, Nigeria's main oil-producing region, had led to disruptions in oil production and currently prevented 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 Niger Delta's minority ethnic groups who felt they were being exploited. Ethnic and political unrest had continued throughout the 1990s.

Competition for oil wealth fuelled violence between innumerable ethnic groups, causing the militarisation of nearly the entire region by ethnic militia groups as well as Nigerian military and police forces. There had been many examples of corporate influence of the Nigerian military repressing protestors. On a bad day, more than 200,000 barrels of oil were stolen by militant gangs, who ferried it out to tankers plying their illegal trade on the high seas. The proceeds, which by some accounts might run beyond \$10 billion a year, had 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 was widespread fear that MEND would 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 deep-water arena would be immune to the violence plaguing operations onshore.³²

Despite billions of dollars in investment under the former government of Olusegun Obasanjo, there was hardly more electricity in 2008 than there was 10 years ago in the national grid, which by some estimates met only 5% of potential demand.³³

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

³¹ "Oil: Financing shortfall shackles output" by William Wallis; June 23 2008, www.financialtimes.com

³² "The Niger delta: Fragile strategies for a complex conflict" by Matthew Green, Published: June 23 2008 17:47 | Last updated: June 23 2008 17:47, www.financialtimes.com

³³ "Heady excitement dampened by doubt" by William Wallis and Matthew Green, Published: June 23 2008 17:47, www.financialtimes.com

DAVID'S DECISION

As Passami paced around his office in Lagos, he knew that it was crucial to get an accurate picture of valuation of this project. Several factors ran through his head—drop in oil demand from the 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 political and economic risk in the country. While the deep-water 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 deep-water 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 no 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 his 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 9) 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 likely 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 indicated that the price of oil would stay flat or increase modestly (see Exhibit 9). 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. The US Labor Department reported that American employers axed 49,000 jobs in May, the fifth straight month of job losses, an event that signalled 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, 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

³⁴ <http://news.bbc.co.uk/2/hi/7440536.stm>, Published on 7 June 2008)

However, Passami knew that a severe US 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 were calculated quite differently from other industries. Since production of oil was primarily depletion of a country's natural resources, the governments demanded a high premium. Exhibit 10 presents sample calculation of taxes and royalties. As shown in Exhibit 10, in Nigeria, the government collected an 18.5% royalty on gross oil production. In addition, the government also collected an 85% tax on profits generated by the oil projects. This tax was enforced on all profits remaining after deducting operating, capital expenditures and a 16% profit allowance for oil firms.

While Passami had a strong grasp on these calculations, he knew they were potentially subject to change in the future. Nigeria 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 was highly likely that there would be a change in either the Royalty or Tax rate, 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%. These groups strongly believed that the foreign governments and corporations were exploiting Nigeria's precious resources of high quality crude oil for a meagre 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 accounted for this risk in the discount rate. Exhibit 12 presents a checklist of risk considered in the project.

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 its investment so long as it 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 was establishing itself as a premier player in deepwater production. And particularly as a smaller player (in terms of overall assets) among its peers, this reputation was critical for Petrobras to get a piece of the action at some of the landmark locations around the world. David pored over the latest report on World Deepwater Reserves and wondered for how many new projects Exxon or other large players like BP might call on Petrobras's expertise after it had proven itself at Agbami. After all, Petrobras

had not bid for the initial concession, 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 one billion barrels of 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 11).

Drilling Costs

By the end of May 2008, the partners had used one rig to drill 16 wells. Estimates suggested 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—the daily price for a rig had risen from \$450,000 a year earlier to over \$500,000 today due to a supply shortage of deepwater drilling rigs. And this was only being pushed upward 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 8) over the current 2009 projection and a 20% growth rate over each of the subsequent three years. However, by 2013, David felt the increase 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 a slightest provocation could end the tentative peace that existed 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 oil per day. For these reasons, it was not certain if Petrobras would remain in Nigeria. Yet, this decision was far from being clear cut—since the Brazilian government was a 56% shareholder in Petrobras, Passami had to consider Brazil's foreign policy and its ties with Nigeria as a trading partner. The two countries 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

³⁵ “Cost of Offshore Drilling Rising as Fast as Oil Prices”, <http://industry.bnet.com/energy/100029/cost-of-offshore-drilling-rising-as-fast-as-oil-prices/>

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 might recommend that Petrobras consider an offer price of up to 10% below the intrinsic value of its stake in Agbami.

Exhibit 1 Important Milestones in the History of Petrobras	
1953:	The company is created by president Vargas.
1954-61:	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 <i>Law N. 9.478</i> , 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 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 gas 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#Milestones>, accessed on 12 February 2012.

Exhibit 2 Income Statements (\$ '000)		
Period Ending	Dec. 31, 2007	Dec. 31, 2005
Total Revenue	112,425,000	56,324,000
Cost of Revenue	51,212,000	30,837,000
Gross Profit	61,213,000	25,487,000

(Contd.)

³⁶ "Foreign Relations of Brazil", <http://www.wikipedia.com>

(Exhibit 2 Contd.)

Period Ending	Dec. 31, 2007	Dec. 31, 2005
Research Development	881,000	399,000
Selling General and Administrative	8,386,000	5,056,000
Non Recurring	271,000	156,000
Others	30,234,000	2,926,000
Total Operating Expenses	39,772,000	8,537,000
Operating Income or Loss	21,441,000	16,950,000
Total Other Income/Expenses Net	(2,377,000)	(1,974,000)
Earnings Before Interest And Taxes	19,299,000	15,115,000
Interest Expense	—	523,000
Income Before Tax	19,299,000	14,592,000
Income Tax Expense	5,888,000	4,441,000
Minority Interest	(273,000)	35,000
Net Income From Continuing Ops	13,138,000	10,186,000
Discontinued Operations	—	—
Extraordinary Items	—	158,000
Effect Of Accounting Changes	—	—
Other Items	—	—
Net Income	13,138,000	10,344,000

Source: Yahoo Finance

Exhibit 3 Balance Sheet (\$ '000)

Period Ending	Dec. 31, 2007	Dec. 31, 2005
Assets		
Current Assets		
Cash and Cash Equivalents	6,987,000	9,871,000
Short Term Investments	267,000	456,000
Net Receivables	11,207,000	9,396,000
Inventory	9,231,000	5,305,000
Other Current Assets	1,448,000	750,000
Total Current Assets	29,140,000	25,778,000

(Contd.)

(Exhibit 3 *Contd.*)

Period Ending	Dec. 31, 2007	Dec. 31, 2005
Long Term Investments	11,501,000	4,914,000
Property Plant and Equipment	84,575,000	45,920,000
Goodwill	313,000	237,000
Intangible Assets	—	—
Accumulated Amortization	—	—
Other Assets	4,171,000	1,776,000
Deferred Long Term Asset Charges	15,000	—
Total Assets	129,715,000	78,625,000
Liabilities		
Current Liabilities		
Accounts Payable	17,616,000	11,929,000
Short/Current Long Term Debt	2,958,000	5,030,000
Other Current Liabilities	3,894,000	1,196,000
Total Current Liabilities	24,468,000	18,155,000
Long Term Debt	12,659,000	16,147,000
Other Liabilities	20,275,000	8,029,000
Deferred Long Term Liability Charges	4,802,000	2,303,000
Minority Interest	2,332,000	1,074,000
Negative Goodwill	—	—
Total Liabilities	64,536,000	45,708,000
Stockholders' Equity		
Preferred Stock	8,620,000	4,772,000
Common Stock	12,196,000	6,929,000
Retained Earnings	41,803,000	32,578,000
Other Stockholder Equity	2,560,000	(11,362,000)
Total Stockholder Equity	65,179,000	32,917,000
Net Tangible Assets	\$64,866,000	\$32,680,000

Source: Yahoo Finance

Exhibit 4 Top Oil Producers, Consumers and Potential Producers

Top Oil Producers		Top Oil Consumers	
Country	Production Capacity (000 barrels per day)	Country	Consumption (000 barrels per day)
Saudi Arabia	10782	USA	19498
Russia	9790	Japan	7831
USA	8514	China	4785
Iran	4174	India	2962
China	3973	Russia	2916
Canada	3350	Germany	2589
Mexico	3186	Brazil	2485
UAE	3046	Saudi Arabia	2376
Kuwait	2741	Canada	2261
Venezuela	2643	South Korea	2175
Norway	2486	Mexico	2128
Brazil	2402	France	1986
Iraq	2385	Iran	1741
Algeria	2180	UK	1710
Nigeria	2169	Italy	1639

Top Countries with Proved Reserves

Country	Proved reserves (billions of barrel)
Saudi Arabia	267
Canada	179
Iran	138
Iraq	115
Kuwait	104
UAE	98
Venezuela	87
Russia	60
Libya	41
Nigeria	36
Kazakhstan	30
US	21
China	16
Qatar	15

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

Exhibit 5 Profile of Nigeria

Area: 923,768 sq km (356,669 sq miles)

Population: 154.7 million

GNI per capita: US \$1,160

Capital: Abuja

Largest city: Lagos

Major languages: English (official), Yoruba, Ibo, Hausa

Major religions: Islam, Christianity, indigenous beliefs

Life expectancy: 47 years (men), 48 years (women) (UN)

Monetary unit: Nigerian Naira; 1 Naira = 100 kobo

Major Political Parties: Peoples Democratic Party, All Nigeria Peoples Party, Action Congress

Head of State: President Umaru Yar'Adua

Vice-president: Goodluck Jonathan

Export partners: USA (38.3%), India (9.9%), Brazil (6.8%), Spain (6.2%), France (5.6%)

Main exports: Petroleum, petroleum products, cocoa, rubber

Credit Rating: B+ (S&P), BB- (Fitch)

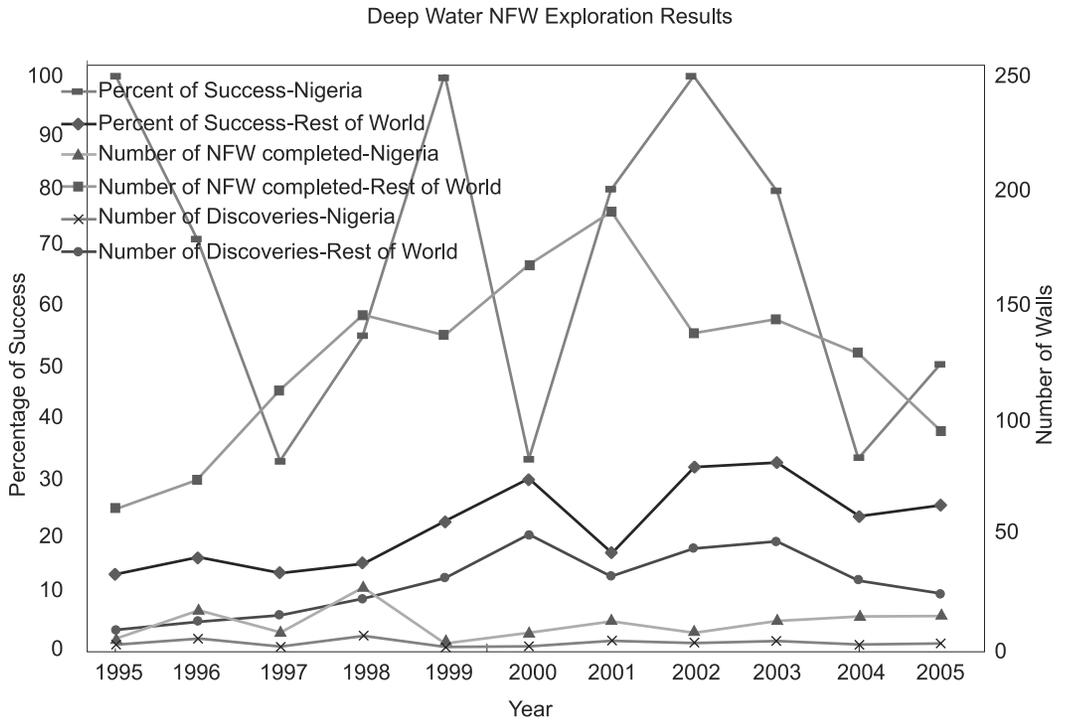
Source: http://news.bbc.co.uk/2/hi/africa/country_profiles/1064557.stm

Exhibit 6 Forecasts of Economic Indicators

	03–08 Avg.	2009	2010	2011
GDP (% growth, real)	7.1	4.5	5.5	5
Inflation (% chg, pa avg)	11.5	12.5	10.5	9.1
Fiscal Balance (% of GDP)	0.6	−4	−4.8	−4
Exports (% CAG)	26.7	−38.7	27.3	−0.3
Imports (% CAG)	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)	128	149	152	155

Source: EIU, EDC Economics

Exhibit 7 Percentage of Success in Deep-water Exploration in Nigeria Compared with the Rest of The World



Source: Andrew Hayman, "Angola-Nigeria: Two Giants of Sub Saharan Africa", IHS—KNOC Energy Conference, July 5, 2007, Seoul

Exhibit 8 Projected Income Statement for the Agbami Project (\$ m)

Fiscal Year Ended December		2010		2011		2012		2013		2014		2015		2016		2017	
Sales	4,332.64	6,236.03	6,315.41	6,404.84	6,529.85	6,161.48	5,777.74	5,385.86	4,967.30	4,523.19	4,048.69	3,550.33	3,024.94	2,473.86	1,893.93	1,286.06	665.53
Royalty at 18.5%	801.54	1,153.66	1,168.35	1,184.89	1,208.02	1,139.87	1,068.88	996.38	918.95	836.79	749.01	656.81	559.61	457.66	350.38	237.92	121.27
Total revenue	3,531.10	5,082.36	5,147.06	5,219.94	5,321.83	5,021.61	4,708.86	4,389.47	4,048.35	3,686.40	3,299.68	2,893.52	2,465.32	2,016.19	1,543.55	1,048.14	534.25
Production expense	(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)
excl. taxes																	
Gross Profit	3,164.34	4,554.48	4,612.46	4,677.77	4,769.07	4,500.03	4,219.77	3,933.56	3,627.86	3,303.51	2,956.96	2,592.98	2,209.26	1,806.78	1,383.23	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)	(5.38)	(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)	(19.73)	(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	2,566.50	3,694.00	3,741.03	3,794.00	3,868.05	3,649.85	3,422.53	3,190.39	2,942.45	2,679.38	2,358.30	2,103.09	1,791.87	1,465.43	1,121.90	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	2,155.86	3,102.96	3,142.46	3,186.96	3,249.17	3,065.87	2,874.93	2,679.93	2,471.66	2,250.68	2,014.57	1,766.60	1,505.17	1,230.96	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 9 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 10 Sample Calculation 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 11 Production Schedule for Agbami						
Year	Capacity Revenue (bls per day)	Capacity (bls per annum)	Capacity Utilization	Actual Production	Price of Crude Oil (per barrel)	\$m
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 12 Key Risks to be Considered while Calculating the Cost of Capital		
	General Risks	Specific Risks
Sovereign		
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	Are any international partners involved in this project who bring credibility to the project and give	
International Partners	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?	

(Contd.)

(Exhibit 12 *Contd.*)

General Risks	Specific Risks
Sensitivity of Project to war, strike, and terrorism	Sensitivity of the project to civil unrest and strike that could affect the ability of employees to carry on their daily work. Is this project more sensitive to war and terrorism than other projects had undertaken in Nigeria?
Sensitivity of Project to natural disasters	Natural disasters are unexpected sudden events that impacts with such severity that it is usually disastrous and uncontrollable
Operating	
Resource Production.	Resources include availability of inputs and raw materials required for production.
Technology	Technology refers to the technological challenges required for ongoing and sustained production.
Financial	
Prob. of default	Default refers to the inability to make debt payments or to come up with adequate financing for completion of a project.

