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The Fall of Petrobras and its Impact on the Brazilian Economy

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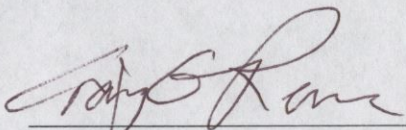
The Fall of Petrobras and its Impact on the Brazilian Economy

**An Honors Thesis submitted in partial fulfillment of the requirements for the degree
Bachelor of Science in Business Administration**

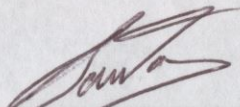
By

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University of Arkansas, Fayetteville
Bachelor of Science in Business Administration, 2016**

**May, 2016
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Abstract

This paper investigates the full scope of the poor decisions made by the Brazilian oil giant, Petroleo Brasileiro. This paper is focused on the midst of a corruption scandal that ended the hopes and dreams of an entire nation. Fundamental analysis as well as technical analysis are used to determine the intrinsic value of Petrobras. Petroleo Brasileiro is analyzed as an oil company, as a mother company for the Brazilian economy and as the disruptor of a recession that will be remembered historically.

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Introduction

One day it finally happened. Millions of Brazilians were gathered at Ipanema beach waiting for the final decision. The envelope was opened and Lula da Silva, former president, and the entire Brazilian delegation broke into tears. The dream started on October 2nd of 2009 when Rio de Janeiro was chosen to be the host city for the 2016 Olympics. With the 2014 Soccer World Cup, Brazil had two major events to make their big entrance and show the rest of the world that the next global power was stepping into the big stage. Unfortunately, things did not start in 2009, they started in 2004 when Petrobras decided to start colluding with other companies. They formed a cartel with many of the biggest construction and service work companies and they would decide who wins all the contracts to build refineries, acquire rigs or offer any type of services to the oil giant (Segal, 2015). Just like that, a culture centered in corruption began and completely faded any illusions of prosperity that every Brazilian had when awarded the Olympics in 2009.

Petrobras was powering the Brazilian economy through an expansion phase that seemed endless in 2012 when making all the preparations for the World Cup. Things drastically changed and now Brazil is suffering a recession accompanied with over 10% real adjusted inflation. What changed? How did prosperity become desperation? How a nation full of dreams and hopes became a nation full of doubts and anger? This paper will analyze the roots of the biggest scheme in Brazilian history and how Petrobras became the key to explaining the recession. This paper finds that Petrobras scandal had a major impact in the Brazilian economy. This paper is valuable to the literature of energy finance since it analyzes one of the most important energy companies from emerging markets. The valuation and financial analysis of Petrobras also suggest major problems in the future as the company tries to rebuild their reputation and financial stability.

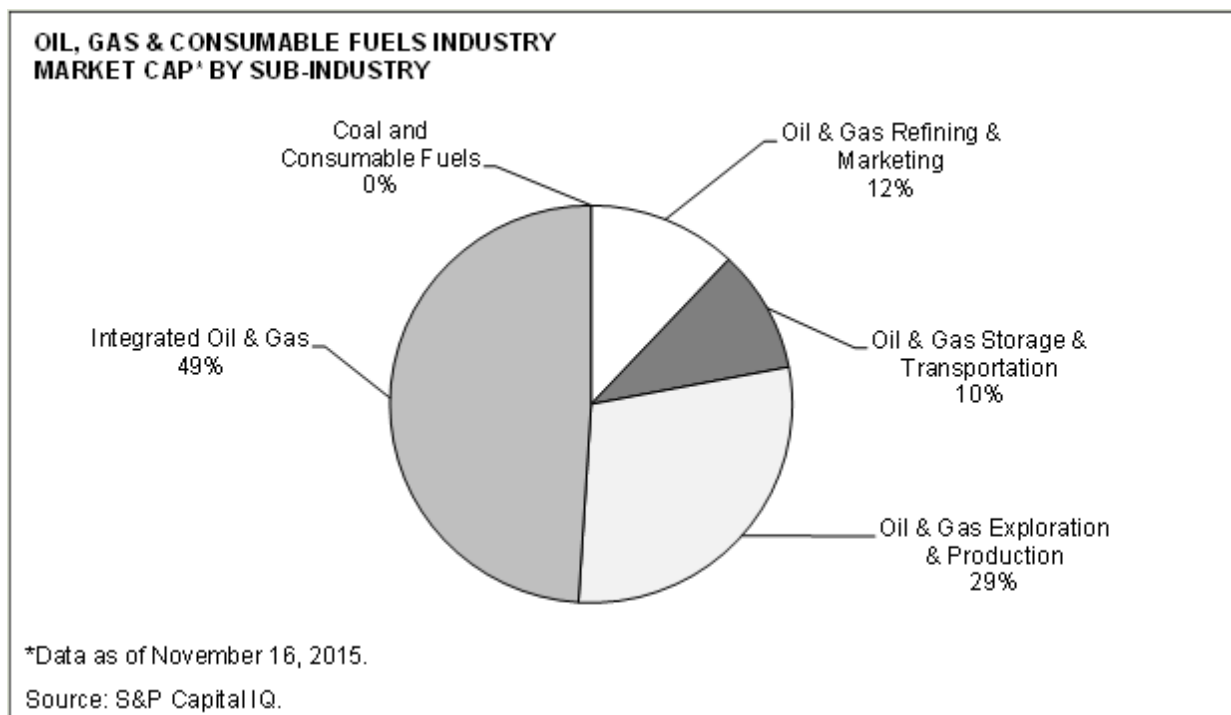
The paper is structured as follows: Section 2 discusses relevant literature in industry features. Section 3 introduces the company profile that includes a general description, revenue breakdown and the analysis of current price targets. Section 4 summarizes the Petrobras scandal and gives key participants and characteristics of the scheme. Section 5 presents a financial analysis in terms of liquidity, leverage, activity, profitability and price. Section 6 presents a valuation of Petrobras in terms of discounted cash flow and a comps model. Section 7 focuses on technical analysis with a candlestick chart and a point and figure chart. Section 8 summarizes the effect of Petrobras scandal on the Brazilian economy and section 9 lists the conclusions of my findings.

Industry Features

Petroleo Brasileiro is part of the oil, gas and consumable fuels industry and the integrated oil and gas sub-industry. The rapid decline in oil prices since the end of 2014 has had a tremendous impact in the energy sector. According to S&P Capital IQ, “the 11.3% drop for the energy sector in 2014 underperformed against the 11.4% increase in the S&P 500 and in the first 11 months of 2015, the sector declined 15.6% compared with a 1.0% increase for the S&P 1500 index” (S&P Capital IQ, 2015b). As for the outlook of the next quarters, the views in the industry are starting to change from negative to neutral mainly due to a global projection made by the International Energy Agency, which estimates an increase in demand for oil approximate to 1.2 million barrels per day (S&P Capital IQ, 2015e).

Figure 1 shows the breakdown of the industry in terms of market capitalization. Close to 78% of this industry is comprised of the oil & gas exploration & production sub-industry and the integrated oil & gas sub-industry, both of which can be considered as upstream operations. Midstream and downstream operations comprise the remaining 22% market capitalization of the industry.

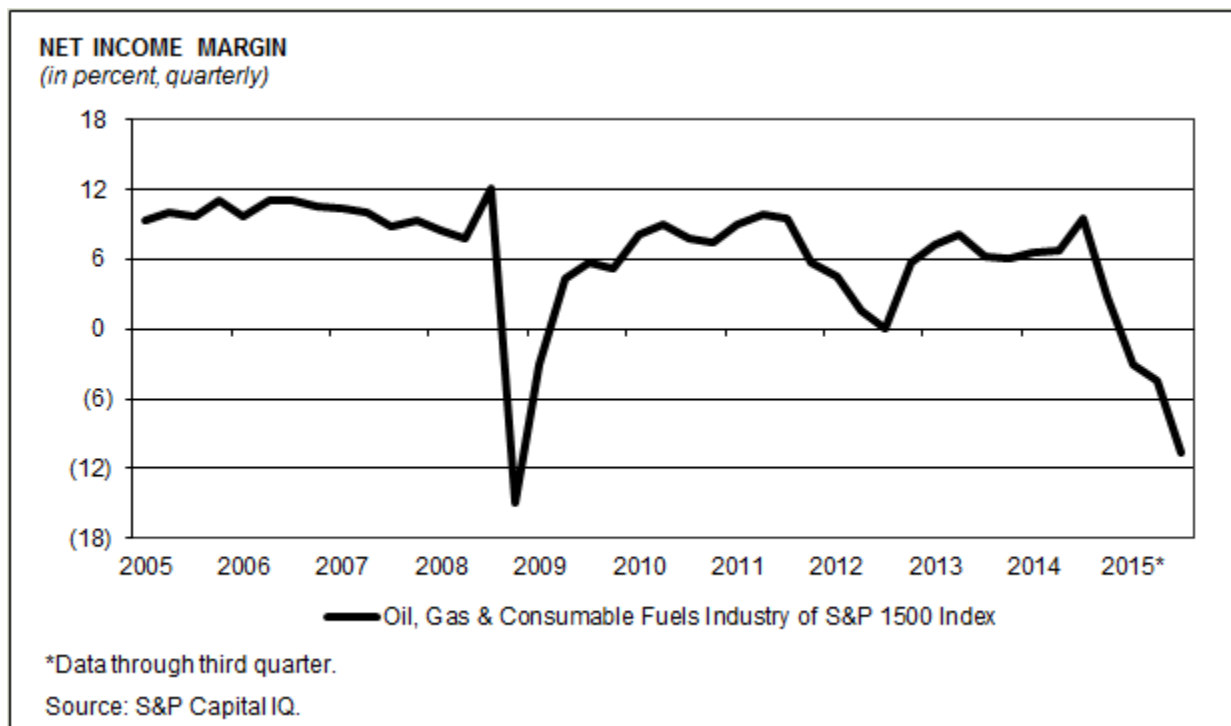
Figure 1: Breakdown of the Oil, Gas & Consumable Fuels Industry



*Source: S&P Capital IQ (2015c)

Figure 2 displays a ten-year net income margins volatile trend with some key features. In 2015, the net margin plummeted for three consecutive quarters, going from -3.1% to -10.6% by the end of the third quarter and this marks the first time going back to 2005 that the oil, gas & consumable fuels industry registered consecutive negative net income margin quarters within the same year (S&P Capital IQ, 2015d).

Figure 2: Oil, Gas & Consumable Fuels Net Income Margin



*Source: S&P Capital IQ (2015d)

The plummet in both earnings and revenues for the industry throughout 2015 have had many oil companies like Petroleo Brasileiro struggle tremendously, even more so with the lack of growth in GDP in Brazil. Even though the stage tumbled in 2015, the industry is expected to experience a modest recovery by the end of 2016. This recovery will be dependent upon reducing completion costs and drilling as well as increasing efficiency gains. It is imperative that exploration & production lower their levels of activity to aid in the fight against this prolonged decline of the sector (S&P Capital IQ, 2015a). As I take a top-down approach for the quantitative and qualitative analysis of Petroleo Brasileiro, it is important to take into account the recent industry activity discussed above.

Company Profile

Petroleo Brasileiro S.A. is a Brazilian based company that explores, produces, refines, and supplies oil and natural gas. Short named Petrobras owns and operates petrochemical units, oil tankers, river and lake terminals, fertilizer plants, thermal power plants and distribution pipelines across the vast Brazilian territory with main operations in South America (Bloomberg, 2016h). With a market capitalization above \$30 billion, Petrobras is the biggest company in South America and one of the biggest producers of oil in the world. Aldemir Bendine has been recently selected as the new Chief Executive Officer and the company employs over 80 thousand people (Bloomberg, 2016h). It is important to note that Petrobras is a mixed joint stock corporation and the more than half of the voting rights are controlled by the government of Brazil (Standard & Poor's, 2016a).

Table 1 displays the revenue breakdown from different operations incurred by Petrobras. Their largest portion of revenue comes from refining & marketing.

Table 1: Revenue Breakdown

Petroleo Brasileiro S.A. Revenue Breakdown	
Refining & Marketing	50.85%
Midstream - Oil & Gas	28.28%
Oil & Gas Services & Equipment	11.28%
Exploration & Production	9.57%
Biofuels	0.02%

**Source: Bloomberg L.P. (2016i)*

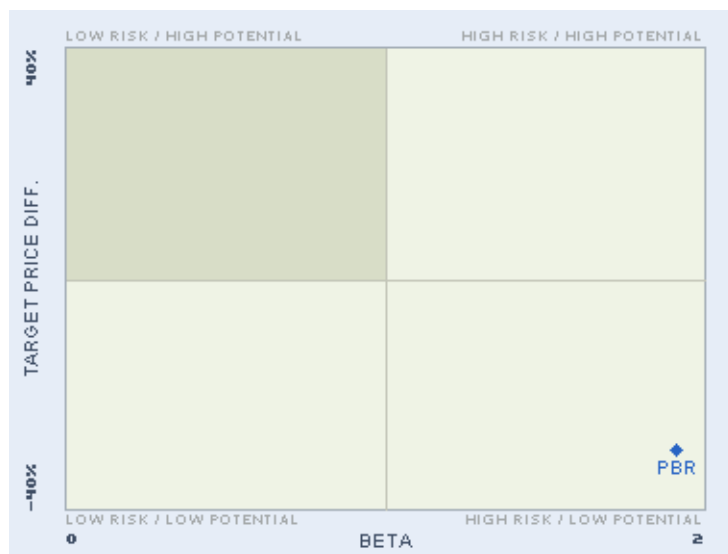
Across 61 years of operations, Petrobras has been portrayed as the heart and soul of the Brazilian economy. Its presence and reputation were always valued highly. This company contributed to the Brazilian culture as the main sponsor of multiple local productions and its image was that of security, transparency and joy. Unfortunately, in 2014 everything changed and now Petroleo Brasileiro is struggling like never before.

In April of 2015, Petrobras had astonishing \$17 billion write-downs in the fourth quarter all associated with the ongoing corruption scandal, which we will discuss in the next section. The legal battle is not the only concern for Petrobras. The company holds a great amount of its debt in U.S. dollars and the continued currency devaluation of the Brazilian real has reached 15% against the USD year over year (Standard & Poor's, 2016a). Debt ratios need to be analyzed closely as by this time they are above the industry averages. A positive sign is shown by Petrobras' tremendous production potential for the long term that is explained by pre-salt blocks located outside of Brazil. However, the short term still involves a lot of risk due to potential

declines in oil prices, increased levels of inflation in Brazil and legal accusations that are causing political unrest (Standard & Poor's, 2016a).

Figure 3 shows Petrobras' target price differential against beta in a four quadrant matrix. As the matrix shows, Petrobras falls under the lower right quadrant that is classified as high risk and low potential. With a beta close to 2, Petrobras shows greater volatility compared to the overall market and the low price target differential targets the stock with low potential expectations. According to Standard & Poor's independent equity research, "PBR is expected to grow production by about 1.3% on a barrel of oil equivalent basis in 2016, below the average for supermajor oils, and the company also has a considerably higher net debt-to-capital ratio (51% versus a peer group average of 13%)" (Standard & Poor's, 2016a). The decline in earnings and the increased uncertainty regarding the future of the company has its roots set in 2014, which I will categorize as the Petrobras scandal in the following section.

Figure 3: Risk vs Reward Matrix



**Source: Standard & Poor's (2016b)*

Petrobras Scandal

Brazil's rise was empowered by the oil giant Petroleo Brasileiro with some of the biggest oil discoveries in the past decade. The surge was so tremendous that government officials started making claims regarding near future energy independence. As of April, 2014 things changed drastically. The oil giant faced a boiling scandal over the acquisition of a Houston refinery, which began in 2006 and was completed years later, because Petrobras acquired it at an estimated cost of \$1.19 billion from Astra, an oil trading company from Belgium, who only paid \$42.4 million the year before. (Romero & Thomas, 2014). That is where the legal battle took off as more accusations of bribery and wrongdoing emerged. Paulo Roberto Costa, one of Petrobras's high ranked former executives who led operations in refinery until 2012, was arrested because of his supposed involvement in a straggling money-laundering arrangement where he might have received bribes in order to increase the cost in the constructions of a

refinery from \$2.5 billion to \$18.5 billion (Romero & Thomas, 2014). If you think this is troubling, they were just getting started.

Petrobras also faces inspection over many claims that some employees received bribes totaling \$139 million from SBM Offshore, an oil rigs supplier from Germany (Romero & Thomas, 2014). This matter is still under further investigation from federal officials. A different investigation is focusing its efforts on a specific contract with Odebrecht, which is one of Brazil's biggest construction and oil services providers. This \$825 million contract is claimed to be gross overbilled (Romero & Thomas, 2014).

According to Bloomberg, "a team of dedicated federal prosecutors and police has conducted 1,114 inquiries, carried out 133 arrests and is pursuing \$4 billion in stolen assets, with care and little drama" (Margolis, 2016a). Sergio Moro is the man who has the power to take down giants as he is the federal judge in charge of these cases. One of the giants taken down was nonetheless Odebrecht ex-CEO, Marcelo Odebrecht. The company that was founded by his grandfather is the biggest construction company in South America. Marcelo was sentenced to 19 years in prison because of his involvement in this never ending scandal. The billionaire was convicted of organized crime, corruption and money laundering (Dickerson, Magalhaes & Lewis, 2016). If this were a fishing contest, we could say that Sergio Moro is catching whales. Prosecutors also allege that "some of Brazil's largest construction firms, including Odebrecht, skimmed billions of dollars from Petrobras through inflated contracts, then channeled some of the funds to the ruling Workers' Party and its allies as part of a year's long pay-to-play scheme" (Dickerson, Magalhaes & Lewis, 2016).

The bottom of the iceberg was saved for ex-president Luiz Inacio Lula da Silva. On March 3rd, 2016, claims were made that the former President, most commonly known as Lula, arranged a scheme to buy off a witness that was involved in the Petrobras scandal (Margolis, 2016a). On March 4th, Lula was interrogated by the federal police on the belief that he profited from the scandal. Weeks later, in a separate case, prosecutors from the city of Sao Paulo were seeking the ex-president's arrest with charges of false declarations and money laundering. A trial could cause Lula a long sentence up to 13 years in prison (Margolis, 2016a). We are talking about a man that was beloved by the people of Brazil. An ex-president that left after 8 years of prosperity and economic growth. The man that orchestrated the obtention of the Soccer World Cup and the Olympic Games.

Despite the astonishing pile of cases, investigations and allegations, it is still very early to determine the final conclusion regarding the scandal, but it is certain that the government is now on the defensive. On the outside, millions of protesters are flooding the streets of Brazil demanding current president Dilma Rousseff to resign while congress starts an impeachment drive from the inside (Margolis, 2016a).

Another difficult challenge for Petrobras is that their role as a powerful energy company is not the only one they have to take. There is a heated debate over the degree to which the Brazilian government uses Petrobras's strength and wealth to achieve economic and political goals. For example, President Dilma Rousseff did not allow Petrobras to raise prices in order for them to meet the cost of refined diesel and gasoline in an attempt to decelerate inflation during

an election year. The results were dramatic as Petrobras lost an approximate \$8 billion in 2013 on their transportation, refining and marketing operations (Romero & Thomas, 2014). Not only Petrobras is fighting against corruption, bribery, and bad leadership, but they are also fighting against unlimited government power that controls their operations and possibly their future. As we learned more about some of the external factors that have led Petrobras into the wrong direction, now we will focus on the financial analysis of the company to have a clear picture of the damage, stagnation and decline of the Brazilian oil giant.

Financial Analysis

Petroleo Brasileiro was characterized for having incremental revenues from 2005 until 2011 growing by almost 160% over the course of 7 years. That trend reversed since 2012 when the midst of the scandal started to unveil. From 2011 to 2014, gross profit has fallen by 26% and net income hit negative \$10.9 billion by the end of 2014. I used a compounded annual growth rate of negative 4.61% to project gross profit until 2019. The reason I used gross profit instead of revenues is because it reflects the incremental cost of revenues that the company has experienced since 2012 and has driven gross profit into a negative trend. Earnings per share have fallen from 2.03 in 2010 to negative 0.71 in 2014. My projections for EBITDA also have a declining trend of 59% up to 2019. In terms of the balance sheet, I expect a decrease in net fixed assets, which have been a key investment target for Petrobras with over \$219 billion in 2014. For 2019, my target is close to \$184 billion. Petrobras has failed in the control of their expenses so they have to cut capital expenditures as more and more legal write-downs continue to affect the profitability of the company. Petrobras has seen a tremendous increase of 470% in long term liabilities since 2005, but I expect this to normalize in the following years due to the high cost of debt due to current downgrades and increased speculation regarding the future of the Brazilian oil giant. In terms of cash flow, cash from operations continues to decline and put pressure on future free cash flow. I expect the company to continue to struggle with negative free cash flow in 2016 close to negative 9.8 billion. To continue our analysis, I will focus on five different categories of comparative ratios between Petrobras and five other competitors that we have identified by market capitalization.

Table 2 shows four different measures of liquidity to compare Petrobras against its peers. Petrobras shows stronger cash, current, and quick ratios mainly because most of their liabilities are long term. This is a positive sign in terms of liquidity even though they have among the lowest cash to total assets ratio with 5.58%.

Table 2: Comparative Ratios of Liquidity

Liquidity Ratios				
Company Name	Cash Ratio	Current Ratio	Quick Ratio	Cash/Total Assets
PETROLEO BRASILEIRO	0.83	1.63	1.09	5.58%
TOTAL SA	0.57	1.38	0.93	10.37%
CHEVRON CORP	0.43	1.34	0.91	4.14%
ECOPETROL SA	0.43	1.15	0.62	5.33%
CHINA PETROLEUM & CHEMICAL	0.02	0.60	0.19	6.96%
BP PLC	0.49	1.29	0.74	10.08%

**Source: Bloomberg L.P. (2016d)*

Table 3 shows five different measures of leverage to compare Petrobras against its peers. Petrobras has the lowest S&P credit rating classified as highly speculative and very close to substantial risks. Total debt to total equity ratios shows that Petrobras is the company that uses the greatest amount of debt to finance its assets relative to stockholder's equity. Total debt to EBITDA is another bad indicator of leverage for Petrobras since they also have the highest among its peers. This suggests that the company may have troubles servicing their debt and if they want to continue to take on more debt it is going to be difficult to convince creditors as they see this metrics.

Table 3: Comparative Ratios of Leverage

Leverage Ratios					
Company Name	S&P Rating	Total Debt/Total Equity	Total Debt/EBITDA	Total Debt/Capital	Financial Leverage
PETROLEO BRASILEIRO	B+	112.97%	6.75	53.05%	2.35
TOTAL SA	A+	56.66%	2.36	36.17%	2.48
CHEVRON CORP	AA-	25.08%	1.92	20.05%	1.73
ECOPETROL SA	BBB	117.67%	6.47	54.06%	2.37
CHINA PETROLEUM & CHEMICAL	N/A	51.63%	1.81	34.05%	2.44
BP PLC	A-	54.05%	2.54	35.08%	2.62

**Source: Bloomberg L.P. (2016c)*

Table 4 shows three different measures of activity to compare Petrobras against its peers. In terms of activity, Petrobras falls closely with the industry average except on the cash conversion cycle. This is a very important metric that measures the effectiveness of management to employ liabilities and short term assets in order to generate cash for the company. Petrobras has the highest among its peers, which shows the constant problem we have detected all along this analysis, which is poor management.

Table 4: Comparative Ratios of Activity

Activity Ratios			
Company Name	Inventory Turnover	Cash Conversion Cycle	Accounts Payable Turnover
PETROLEO BRASILEIRO	8.05	28.51	9.65
TOTAL SA	N/A	N/A	5.61
CHEVRON CORP	18.46	13.86	7.30
ECOPETROL SA	12.17	-26.03	4.43
CHINA PETROLEUM & CHEMICAL	11.85	14.25	11.94
BP PLC	12.41	19.85	9.90

**Source: Bloomberg L.P. (2016b)*

Table 5 shows five different measures of profitability to compare Petrobras against its peers. Petrobras has the second lowest ROE and ROA among its peers. This shows the inability of the company to generate returns and the negative return on assets simply add more concern towards the future of the company. Return on invested capital is higher than ROE, but it is still below industry average. However, Petrobras has the highest EBIT and EBITDAX margins, which shows better cost management even when we add exploration expenses.

Table 5: Comparative Ratios of Profitability

Profitability Ratios					
Company Name	Return on Equity	Return on Assets	Return on Invested Capital	EBIT Margin	EBITDAX Margin
PETROLEO BRASILEIRO	1.55%	-2.80%	2.46%	12.21%	17.38%
TOTAL SA	9.13%	3.75%	1.92%	7.27%	11.52%
CHEVRON CORP	4.13%	2.38%	-1.63%	-0.79%	14.14%
ECOPETROL SA	-7.13%	-3.01%	7.95%	2.79%	15.79%
CHINA PETROLEUM & CHEMICAL	3.86%	1.53%	5.70%	2.08%	6.26%
BP PLC	3.80%	1.45%	-3.80%	1.76%	3.01%

**Source: Bloomberg L.P. (2016f)*

Table 6 shows four different measures of price to compare Petrobras against its peers. P/E suggests lower earnings growth for Petrobras as the 2 year forward is 16.88. The enterprise multiple is in line with its peers and Petrobras is the only company that does not pay dividends.

Table 6: Comparative Ratios of Price

Price Ratios				
Company Name	Est P/E Current Yr.	P/E - FY2	EV/EBITDAX	Dvd 12M Yld
PETROLEO BRASILEIRO	26.88	16.88	6.30	N/A
TOTAL SA	15.89	11.43	7.80	5.69
CHEVRON CORP	64.69	19.31	8.56	4.38
ECOPETROL SA	17.32	6.57	4.55	10.04
CHINA PETROLEUM & CHEMICAL	15.38	14.98	N/A	5.06
BP PLC	26.38	12.36	4.80	7.49

**Source: Bloomberg L.P. (2016e)*

Company Valuation

In order to find the intrinsic value of Petroleo Brasileiro, I developed a discounted cash flow model and a comps model based on price to earnings and enterprise value to EBITDA. The following figures illustrates my analysis.

Figure 4 shows the discounted cash flow model for Petroleo Brasileiro. I used the fair value multiple method to determine the share price of Petrobras. The market risk premium was found by subtracting the expected market return by the 10-year treasury. To find the CAPM cost of equity I multiplied beta times the market risk premium and added the 10-year treasury. The after tax cost of debt was calculated using a 10% tax rate. With this information and the percentages of debt and equity of the company I calculated a weighted average cost of capital of 31.2%. The perpetual growth of the firm's cash flow was not utilized since I chose a fair value method instead of a perpetuity method in order to reduce the number of assumptions in the model. With the weighted average cost of capital, I was able to calculate the discount factor. With the discount factor, we found the present value free cash flows to the firm. Terminal value was calculated by multiplying the EBITDA multiple at the last forecast of EBITDA. By discounting the terminal value to the present, I was able to calculate an enterprise value of \$87.4 billion when I added the present value of the terminal value and the present value of the forecast free cash flows. By subtracting long term borrowings and adding cash, net debt equaled \$56.5 billion and an equity value of \$30.8 billion. When dividing the equity value by the shares outstanding, we concluded that the fair value share price of Petrobras equals \$2.36

Figure 4: Discounted Cash Flow Model

Discounted Cash Flow Model - Valuation Assumptions		FCFF Fair Value Multiple Method	
		EBITDA Multiple	6.3x
10 Year US Treasury	1.95%	Last forecast EBITDA	21,225
Expected market return	9.03%	Terminal Value	132,655
Market risk premium	7.1%	Present Value of Terminal Value	34,089
Beta	2.09	<i>Terminal Value as % of Total Value</i>	39.0%
CAPM cost of equity	16.7%	Present Value of Forecast FCF	53,387
Cost of debt	37.7%	<i>Forecast Period as % of Total Value</i>	61.0%
Tax rate	10.0%	Enterprise Value	87,476
After tax cost of debt	33.9%	- Long Term Borrowings	80,444
Equity %	15.70%	+ Cash	23,861
Debt %	84.30%	Net Debt	56,582
WACC	31.2%	Equity Value (Market Cap)	30,894
Perpetual growth of firm cash flows (post year 5)	2.50%	Shares outstanding	13,044
Valuation date	15-Mar-16	Fair value share price	2.36833

Projected Fiscal Years Ending December 31					
Free Cash Flows	2015	2016	2017	2018	2019
EBIT	16,282	15,532	14,817	14,134	13,483
EBIT * (1-tax rate)	14,654	13,979	13,335	12,721	12,135
Depreciation And Amortization	9,348	8,918	8,507	8,115	7,741
EBITDA	25,630	24,450	23,324	22,250	21,225
Free cash flows to the firm (FCFF)	24,002	22,897	21,842	20,836	19,877
<i>Years to Discount</i>	1.00	2.00	3.00	4.00	5.00
<i>Cost of Capital</i>	31.2%	31.2%	31.2%	31.2%	31.2%
<i>Discount Factor</i>	1.31	1.72	2.26	2.97	3.89
PV Free cash flows to the firm (FCFF)	18,291	13,296	9,666	7,026	5,108

*All the numbers highlighted in blue have been retrieved from Bloomberg L.P as of March 15th, 2016

*Perpetual growth of firm cash flows is tied to 10 year US GDP outlook

* This model is prepared for educational purposes only. It is in no way a solicitation to buy/sell securities, and no guarantees or warranties about the accuracy of information contained in it are implied.

Figure 5 shows the COMPS model for Petroleo Brasileiro. I pulled the price to earnings and enterprise value to EBITDA for Petroleo Brasileiro and their direct competitors to compute price from P/E and price from EV/EBITDA. In order to find the share price from P/E I multiplied basic earnings per share by the average P/E of all the companies included in the analysis. This gives us a fair value price from P/E of \$4.94. For the EV/EBITDA setup, I pulled the estimated enterprise value from the income statement, subtracted cash and cash equivalents and added total debt and minority interest to find an estimated market cap of \$29.9 billion. I divided basic weighted shares by the estimated market cap to find a fair value price from EV/EBITDA of \$4.35.

Figure 5: COMPS Model

COMPS Model - Valuation			
Prices Based on Most Recent Annual Report			
Name	P/E	EV/EBITDA	
PETROLEO BRASILEIRO	26.881	6.250	
STATOIL ASA	32.609	3.567	
SUNCOR ENERGY INC	-	11.921	PETROLEO BRASILEIRO
HUSKY ENERGY INC	-	8.292	EPS Basic
MOL HUNGARIAN OIL AND GAS P	9.627	4.334	Basic Weighted Shares
TOTAL SA	15.895	6.970	Estimated EV
CHEVRON CORP	64.695	8.235	Estimated Market Cap
EXXON MOBIL CORP	33.830	10.920	
ECOPETROL SA	17.319	6.538	
PETROCHINA CO LTD-H	22.062	7.356	EV/EBITDA Setup:
CHINA PETROLEUM & CHEMICAL	15.379	5.575	Estimated EV
ROYAL DUTCH SHELL PLC-A SHS	20.320	5.827	- Cash and Equivalents
REPSOL SA	20.543	5.782	+ Total Debt (st debt + lt de
BP PLC	26.376	5.365	+ Preferred Stock
OMV AG	20.036	4.948	+ minority interest
YPF S.A.-D	8.498	2.971	Estimated Market Cap
GALP ENERGIA SGPS SA	21.255	9.183	
ENI SPA	61.290	5.340	
Average	26.038	6.632	Price from P/E
Median	20.543	6.039	Price EV/EBITDA
Standard Deviation	12.970	2.350	
Standard Error	3.0571	0.5539	

*All the numbers pertained within sky-blue cells have been retrieved from Bloomberg L.P as of March 15th, 2016

*Basic EPS have been retrieved from Bloomberg L.P. from the 3rd quarter of 2015

* This model is prepared for educational purposes only. It is in no way a solicitation to buy/sell securities, and no guarantees or warranties about the accuracy of information contained in it are implied.

Table 7 shows the computation for the intrinsic value of Petroleo Brasileiro. Since the discounted cash flow method relies on many different assumptions, I decided to weight the price from this valuation method at 20%. The weights for the price of P/E and EV/EBITDA both equal to 40%. The weighted average of these three different valuations method give us a valuation price of \$4.19. As of April, 8th of 2016, Petrobras is trading at \$5.68. Based on this analysis, we can conclude that Petrobras is overvalued by 26%. The following figures show other key indicators when analyzing the intrinsic value of a company.

Table 7: Valuation Price for Petrobras

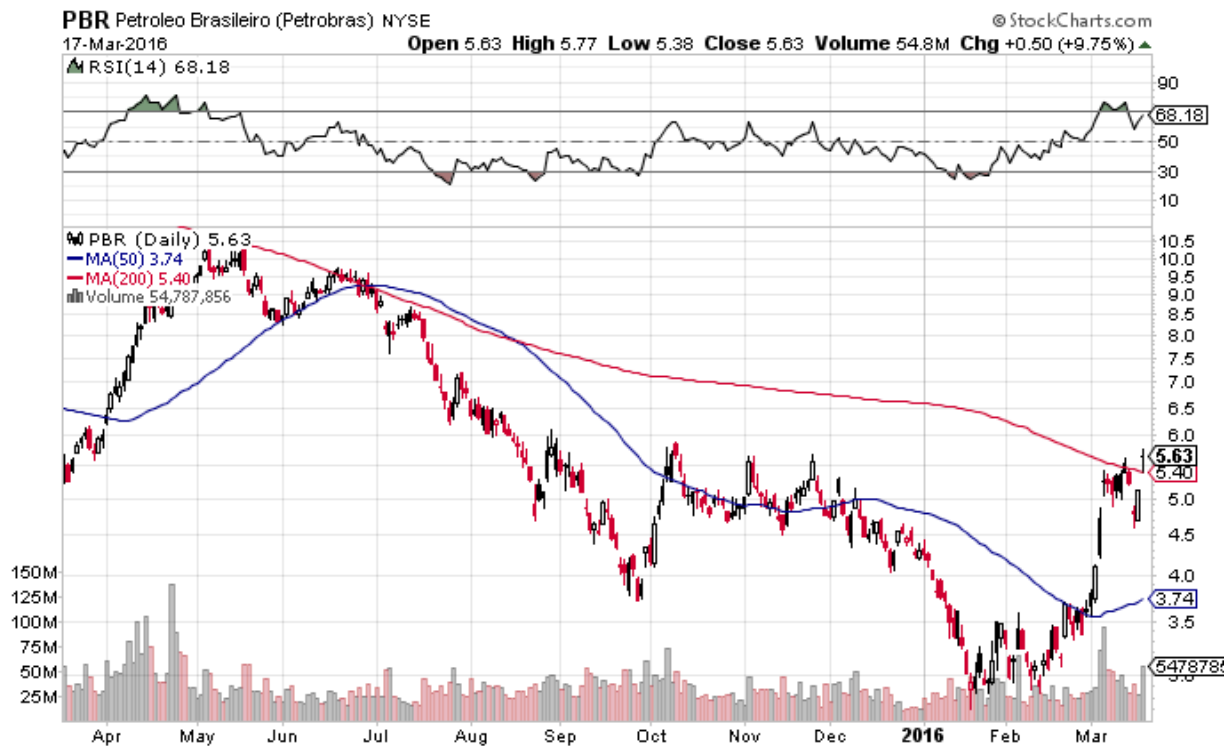
Intrinsic Value of Petroleo Brasileiro	
Price from P/E	4.947
Weighting for Price from P/E	40.0%
Price EV/EBITDA	4.352
Weighting for Price EV/EBITDA	40.0%
Price from Discounted Cash Flow	2.368
Weighting for Price DCF	20.0%
Valuation Price	4.193

Technical Analysis

This next section will evaluate Petrobras on a technical analysis basis in order to identify trends, resistance levels, support levels and signals of overbought or oversold prices. This analysis will help provide a clear picture of how Petrobras is viewed by the market. A candlestick chart and a point and figure chart are explained as follows.

Figure 6 shows a candle stick chart from April 2015 to March 2016. We can see a strong resistance line forming around \$5.50 because we have multiple tests around that line area in October, November, December of 2015 and since March of 2016. Petrobras has not been able to break above this resistance line showing strong levels of supply at that point. The red line shows a 200 day moving average and the blue line shows a 50 day moving average. Since the red line is a long term signal and the blue line is a medium term signal, the temporary cross over in June of 2015 proved to be a false positive signal as the blue line started its decline after the cross over. The current price has surpassed the 200 day moving average, which traditionally is a strong positive long term signal. However, in this case, because the 50 day moving average is still below the 200 day moving average this points towards a short term positive trend. The top part of Figure 16 shows a relative strength index for 14 days. With this index we can identify overbought and oversold areas within the price movement. The small uptrend since January of 2016 started with oversold levels of the relative strength index. Currently, Petrobras is approaching significantly overbought levels which indicate that the short term positive trend can reverse.

Figure 6: Candlestick chart of Petrobras



*Source: Stockcharts.com (2016a)

Figure 7 shows a point and figure chart since 2012 where the X represents demand and the O represents supply for the stock. Supply and demand are shown because the point and figure methodology assumes that stock prices are governed by the laws of supply and demand. The small numbers in red within the graph represent the months within the year in the horizontal axis and the months of October, November and December are represented by the letters A, B and C, respectively. The red line represents the bearish resistance level and the blue line represents the bullish support level. The resistance line clearly reflects and overall downtrend in the price of the stock that pronounces at its greatest at the end of 2014. Since then supply has taken over driving the price down below support levels. No other support level has been identified which suggests that the downtrend will continue. As you can see in figure 7, since September of 2015 a triple top buy signal has been formed and if it is completed, this could signal a short term trend reversal.

Figure 7: Point and Figure Chart



*Source: Stockcharts.com (2016b)

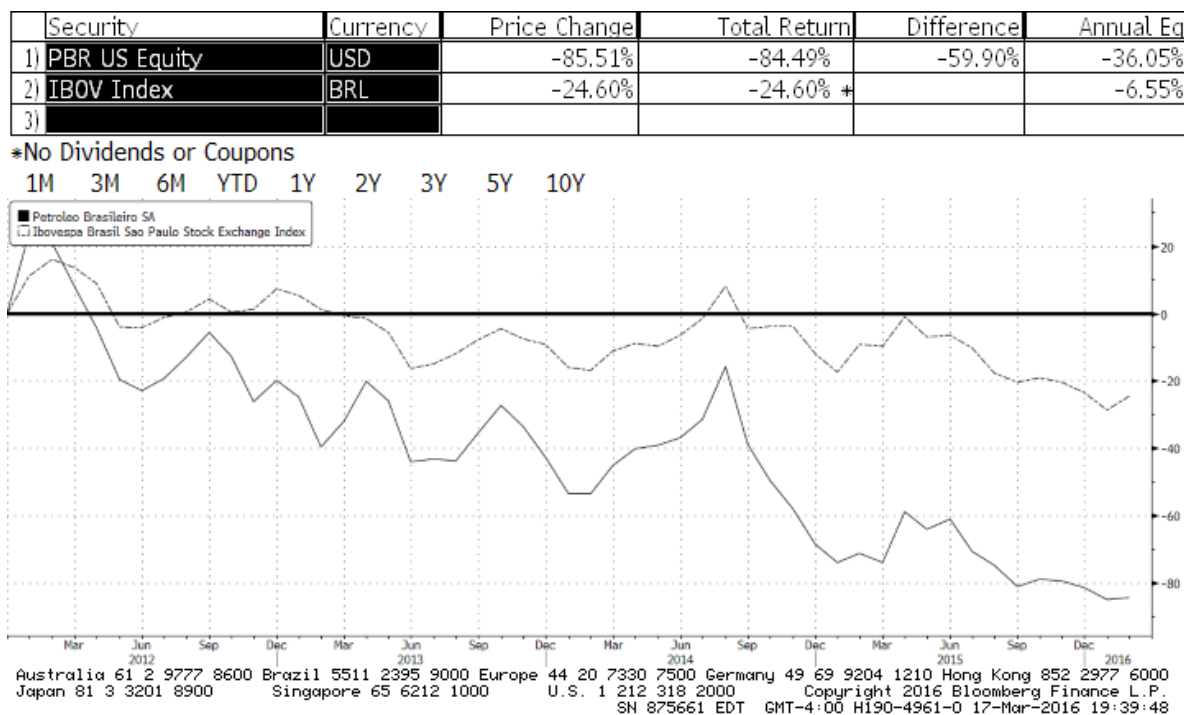
After analyzing the candle stick chart and the point and figure chart we can conclude that the overall long term trend is bearish for the stock as we cannot identify new support levels or identify an established long term upward trend. This is significant because as traders act on this signals it could influence the stock price of Petrobras in a way that differs from the underlying fundamentals of the company.

Impact on Brazil's Economy

Corruption is not something new and it does not surprise Brazilians when they hear about it in the news. Uniqueness is not a synonym for corruption in a country that has experienced it and suffered it for decades. What was not a novelty in this particular Petrobras case was the impressive scale and stunning sums. A \$3 billion scandal of bribes since 2004 makes other corruption cases around the world look like amateur work. If you do not live in Brazil, it is hard to understand the enormity of the scandal and the sense of fury and betrayal from its people. Petrobras was supposed to play a major role in the future growth of Brazil. According to the New York Times, “at one time it was the sixth-largest company in the world by market capitalization and accounted for roughly 10 percent of Brazil’s gross domestic product” (Segal, 2015). Unfortunately, in 2014 Petrobras lost \$70 billion in market cap, which is more than half of its value (Segal, 2015).

Figure 8 shows a comparative returns graph since 2012 with Petrobras against IBOVESPA. The dotted line represents the return of the Index and the dark line represents the return of Petrobras. Since 2012, Petrobras’ stock price has fallen by 84.49% while the index has fallen by 24.60%. Comparing Petrobras against the most representative index of the Brazilian stock market gives us a better picture in our attempt to correlate the downtrend of Petrobras with the recession currently experienced in Brazil. If compared to an oil and gas index, we will not be able to see Petrobras’ overall effect on the economy. According to Bloomberg, IBOVESPA is comprised of 61 members and Petrobras has the second largest weight in the index with 7.3% (Bloomberg, 2016). Figure X shows a clear correlation in both downtrends, which demonstrates Petroleo Brasileiro’s importance for the Brazilian economy.

Figure 8: Comparative Returns Between Petroleo Brasileiro and IBOVESPA



*Source: Bloomberg L.P. (2016a)

A study published in Forbes estimated that “R\$87 billion (\$27.1 billion) was expected to have been lost in GDP this year [2015] because of Petrobras’ corrupt, little ways” (Rapoza, 2015). This equals to 1% of total GDP, Brazil’s GDP is close to \$2.2 trillion, that was simply burned by the greediness and self-indulgence uncovered throughout this scandal. Getulio Vargas Foundation’s Environmental Solutions and Infrastructure Group estimates that engineering, consumer spending, construction and oil and gas service firms will all suffer Petrobras’s reduction in investments to cover the costs of the scandal. Federal funds will need at least R13.6 billion to cover layoffs in construction. OAS and Galvao, important construction companies that were involved with Petrobras, did not have another alternative other than filing for bankruptcy (Rapoza, 2015). The negative effect on GDP in 2015 does not fully account for all the economic losses that this scandal continues to unveil.

The concern is raised even more when you see millions of people taking the streets asking for the president to step down. If this happens, regime change will not change the fact that the recession is closer to a depression than a recovery. Aécio Neves, one of the leaders of the opposition was also insulted by the crowd. Even the president’s impeachment could raise the uncertainty because all the government officials that are in line for replacement are also being investigated. “Vice President Michel Temer, who will fall with Rousseff if the court rules their campaign was illegally financed; House Speaker Eduardo Cunha, facing trail for bribe-taking; and Senate President Renan Calheiros, suspected of money laundering, accepting bribes and tax evasion” (Margolis, 2016b). This has gotten to a point where corruption has not only caused the recession, but is also stopping the recovery.

Conclusion

Taking aside the economic implications of this scandal, an identity crisis has burst among the people. Among those taxpayers that have a sense of humiliation, disgrace and outrage. Mauricio Santoro, a political science professor at Rio de Janeiro State University said the following: “I’ve never seen my countrymen so angry [and] we have this sense that the dream is over” (Segal, 2015). The same dream that began on October 2nd of 2009 when Rio de Janeiro was chosen as the host city for the 2016 Olympics. That dream has been crashed, but if one good thing can come out of all of this is the fact that the cockroaches are coming out sooner or later. Our quantitative and qualitative analysis defend our theory that Petrobras had a major impact on the current Brazilian recession and our valuation and ratio analysis suggest major problems for the future of the company. It is hard to quantify the aftermath because every day new arrests are being made and more companies are being implicated. Even though the operation carwash is underway to reform the values of the company, cockroach theory suggests that this is far from over and we could look as high as the presidential seat for people implicated in this scandal. Because as we said from the start, everything in life has consequences.

Bibliography

Bloomberg. L.P (2016a). Comparative Performance Graph between Petroleo Brasileiro and IBOVESPA from 2012 to 2016. Retrieved March 17, 2016 from Bloomberg Database

Bloomberg L.P (2016b). Comparative Ratios of Activity. Retrieved March 24, 2016 from Bloomberg Database.

Bloomberg L.P. (2016c). Comparative Ratios of Leverage. Retrieved March 24, 2016 from Bloomberg Database.

Bloomberg L.P. (2016d) Comparative Ratios of Liquidity. Retrieved March 24, 2016 from Bloomberg Database.

Bloomberg L.P. (2016e) Comparative Ratios of Price. Retrieved March 24, 2016 from Bloomberg Database.

Bloomberg L.P. (2016f) Comparative Ratios of Profitability. Retrieved March 24, 2016 from Bloomberg Database.

Bloomberg L.P. (2016g) Member Weightings of IBOVESPA Members. Retrieved March 17, 2016 from Bloomberg Database.

Bloomberg L.P. (2016h) Petroleo Brasileiro General Description. Retrieved March 17, 2016 from Bloomberg Database.

Bloomberg L.P. (2016i) Petroleo Brasileiro Revenue Breakdown. Retrieved March 17, 2016 from Bloomberg Database.

Dickerson, M., Magalhaes, L., & Lewis, J. T. (2016). Odebrecht Ex-CEO Sentenced to 19 Years in Prison in Petrobras Scandal. *Wall Street Journal*. Retrieved March 20, 2016, from <http://www.wsj.com/articles/odebrecht-ex-ceo-sentenced-to-19-years-in-prison-1457449835>

Margolis, M. (2016a). Lula Is the Big Test for Petrobras Prosecutors. *Bloomberg View*. Retrieved March 15, 2016, from <http://www.bloombergtview.com/articles/2016-03-12/lula-is-the-big-test-for-petrobras-prosecutors>

Margolis, M. (2016b). 'Regime Change' Alone Won't Cure What Ails Brazil. *Bloomberg View*. Retrieved March 15, 2016, from <http://www.bloombergtview.com/articles/2016-03-15/-regime-change-alone-won-t-fix-brazil>

Rapoza, K. (2015). How Much Of Brazil's Economy Got Lost In Petrobras Scandal? *Forbes*. Retrieved March 15, 2016, from <http://www.forbes.com/sites/kenrapoza/2015/04/04/how-much-of-brazils-economy-got-lost-in-petrobras-scandal/#4b1fee38432c>

Romero, S., & Thomas, L. (2014). Brazil's Star, Petrobras, Is Hobbled by Scandal and Stagnation. *New York Times*. Retrieved March 15, 2016, from http://www.nytimes.com/2014/04/16/business/international/brazils-star-petrobras-is-hobbled-by-scandal-and-stagnation.html?_r=1

Segal, D. (2015). Petrobras Oil Scandal Leaves Brazilians Lamenting a Lost Dream. *New York Times* Retrieved March 15, 2016, from <http://www.nytimes.com/2015/08/09/business/international/effects-of-petrobras-scandal-leave-brazilians-lamenting-a-lost-dream.html>

Standard & Poor's (2016a). Petroleo Brasileiro Company Value, Investments Rationale and Analyst's Highlights. Retrieved March 17, 2016 from <http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/sr/showInteractiveStockReport.do>

Standard & Poor's (2016b). Petroleo Brasileiro Risk vs Reward Matrix. Retrieved March 17, 2016 from <http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/sr/showInteractiveStockReport.do>

StockCharts.com (2016a). PBR Candle Stick Chart. Retrieved March 17, 2016 from <http://stockcharts.com/h-sc/ui>

StockCharts.com (2016b). PBR Point and Figure Chart. Retrieved March 17, 2016 from <http://stockcharts.com/freecharts/pnf.php?c=PBR,P>

S&P Capital IQ (2015a). Industry Expectations and Executive Summary. Retrieved March 17, 2016 from <http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/cp/companyIndustrySurvey.do?task=showIndustrySurveyBySppwId>

S&P Capital IQ (2015b). Oil, Energy Sector Stock Price Performance in 2014 and 2015. Retrieved March 17, 2016 from <http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/cp/companyIndustrySurvey.do?task=showIndustrySurveyBySppwId>

S&P Capital IQ (2015c). Oil, Gas and Consumable Fuels Industry Market Cap by Sub-Industry Chart. Retrieved March 17, 2016 from <http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/cp/companyIndustrySurvey.do?task=showIndustrySurveyBySppwId>

S&P Capital IQ (2015d). Oil, Gas and Consumable Fuels Industry Net Income Margin Graph. Retrieved March 17, 2016 from <http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/cp/companyIndustrySurvey.do?task=showIndustrySurveyBySppwId>

S&P Capital IQ (2015e). Oil, Global Projections in Demand for Oil. Retrieved March 17, 2016 from <http://www.netadvantage.standardandpoors.com/NASApp/NetAdvantage/cp/companyIndustryPage.do>