T.C.
ISTANBUL AYDIN UNIVERSITY
INSTITUTE OF SOCIAL SCIENCES

PERFORMANCE EVALUATION OF MAJOR INTEGRATED OIL & GAS COMPANIES

THESIS

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Department of Business

Business Management Program

Thesis Advisor: Assist.Prof. Dr. Nurgün Komşuoğlu Yılmaz

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ABBREVIATIONS

BOE: Barrel of oil equivalent
CVX: Chevron Corporation
DEA: Data Envelopment Analysis
DMU: Decision Making Unit
E&P: Exploration and Production
EIA:Energy Information Administration
FASB: Financial Accounting Standard Board
FDI: Foreign Direct Investment
FY: Financial Year
IOC: Integrated Oil and Gas Company
IEA: International Energy Agency
IASB: International Accounting and Standards
NOC: National Oil Company
OECD: Organization for Economic Co-operation and Development
OPEC: Organization of Petroleum Exporting Countries
PLC: British Petroleum Corporation
RDS: Royal Dutch Shell Corporation
R&D: Research and Development
ROA: Return on Asset
ROE: Return on Equity
SEC: Securities and Exchange Commission
XOM: Exxon Mobil Corporation

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ÖZET

Günümüzde, kuşkusuz başlıca enerji kaynaklarından olan petrol sektörü; hükûmet prosedürleri, fiyatlar, arz-talep durumları ve jeolojik koşullar başta olmak üzere birçok olumsuz durumla karşı karşıyadır. Dünya üzerinde, zorlu ekonomik ve jeopolitik koşulların hakim olması, bizi şüphesiz küresel petrol şirketlerinin enerji pazarında verimliliklerini sürdürüp sürdürmeyeceklerini düşünmeye sevk eder. Dünyanın önde gelen petrol şirketleri, sektörün zorlu çalışma ortamına ayak uydurabilmek için performans analizine önem vermektedir. Bu çalışmada, küresel dört büyük petrol şirketinin (BP,Exxon Mobil, Chevron, Royal Dutch Shell) finansal ve enerji oranları sunulmuştur. Ayrıca bu dört büyük firmanın 2009-2014 yılları arası seçilen bazı finansal rasyoları kullanılarak veri zarflama analizi yapılmıştır. VZA ile göreceli etkinlikler saptanmış ve firmaların verimlilikleri açıklanmıştır. Araştırma sonucu elde edilen bulgular, incelenen dört şirketten üçünün yeterli performansa sahip olduğunu göstermiştir. Sonuçlara göre bu üç şirketin içinde de Exxon Mobil entkinlik sıralamasında (seçilen input ve outputlar kullanılarak yapılan analizde) ilk sıradadır.

Anahtar Kelimeler: Petrol Endüstrisi, Rekabet Ortamı, Finansal ve Enerji Oranlar Analizi, Veri Zarflama Analizi(VZA), Performans Değerlendirmesi, Uluslararası Petrol Şirketleri.

ABSTRACT

Admittedly, being as prime resource of energy, today oil sector in the grip of numerous negative factors, among which most influential are price, government regulation, supply & demand and geological conditions. With given cruel economic and geopolitical condition prevailed in the world, it is no doubt, gives a premise to wonder of whether global petroleum companies are able to sustain their performance efficiencies in the energy market. The central aim of the study is performance evaluation of major high ranked oil companies in volatile environment. The primary objective was achieved through insightful analysis of four major oil companies (BP, Exxon Mobil, Chevron, and Royal Dutch Shell). Research included Financial, Energy ratios analysis and Data Envelopment Analysis (DEA), in which non-parametric method evaluated the performance efficiencies of related companies. Findings of research has revealed that out of four analyzed companies, three of them has shown satisfactory level of performance. However, among all given corporations, results verified that Exxon Mobil found to be the most outstanding one. Because, notwithstanding to Global tough economic condition, followed by low crude oil price, according to study's selected inputs and outputs, it has shown the excellence from both its financial and operational aspects.

Keywords: Oil & Gas Industry, Competitive environment, Financial & Energy ratio analysis, Data Envelopment Analysis (DEA), performance evaluation, International Oil Companies.

1. INTRODUCTION

The need for resources in the history of humankind has always been the most important factor for political, technological, economic, social evolutions. In modern times, necessity for energy sources became more substantial than the industries in the past like production of ships, wood, constructions and even gold production. Among these energy sources, there is no vital source such as oil and as James Buchan, famous British novelist quoted; today oil is almost as vital to human existence as water.

It is not known when exactly petroleum was first used but today, everyone probably knows that oil industry has been around for millennia now. Because, history often evidenced that oil industry has been used by many nations for different purposes; weapon, medicating, painting etc. However, in 1800's the importance of oil to humankind took a great leap, where it replaced coal as the primary fuel for the machines of industrial revolution. In today's industrial civilization, petroleum (oil) industry represents one of the crucial components of the energy industry just like as the circulatory system of the human body to the modern economy and means power who prevails it. The oil axiom has never been truer "as flows the oil, so flows the prosperity". Today everything from countries' economy and currency exchange rate to countries overall population's security and countries stability seems to hinge precariously on what has come to be known as "Black liquid gold".

Petroleum industry is one of the largest and multifaceted sector that divided into certain segments (upstream, midstream, downstream) and includes the global processes of exploration, extraction, refining, transporting and marketing. Compared with previous century, presently the industry changed dramatically because of significant transformations in the last 150 years. These major changes was vast expansion of national companies and their dominance over the global oil market that once had been prevailed by international oil producers. Among the reasons for such shift in power, the most influential turned to be the unrest in Middle East in 70s, which triggered huge price shocks in main commodity. During that time it became clear how world is dependent on major industrial product as well as its economic well-being. In addition, the industry has shown to be very sensitive to global economic and social instability to which today world is highly vulnerable as escalation of financial crisis.

In the 2008, global economic crisis has been the most serious one after the Great Depression. Worldwide economies underwent close to complete crash shaking the core financial system and world experienced its worst economic condition where many industries bursting at seams. Virtually no country, developing or developed, has avoided from the impact of economic recession. Unprecedented scale of economic downturn has also led to significant reductions in energy investment worldwide. The reason is drop in fuel price, due to weakened demand that resulted in less attractiveness of energy investments. However, the very crisis effect became obvious especially for oil and gas sector followed by price collapses that led companies to starve for cash flows. In addition, with emerging global finance crisis, it seems that today most countries are in pressure to nationalize their resources in attempt to secure and support public finance thus leaving public to think of negative consequences on the international oil and gas market.

In contrast to financial crisis, the latest development in the energy sector has shown that oil and gas industry thus far has been involved in numerous issues that had the great long-term impact on both countries and on the world at large. Among the examples are the recent conflicts risen in Middle East and Ukraine, which led public to be worried about possible supply disruptions in oil and gas outputs. Considering world condition, it appears that today global geopolitical environment is becoming more violent. Moreover, assuming the uncertainties of future oil and gas availability, today such questions rise even more tensions among the public. Even though today most countries are seeking for renewable energy sources, it seems to be certain is that oil and gas will remain as a major source in the following decades. Taking into account of today's geological condition, where companies have only 10% percent of success in finding oil, it gives additional premise to wonder on the future sustainability of oil and gas industry.

Therefore, reviewing all above trends and developments in oil and gas industry, the following study attempts to analyze the international oil and gas companies in the current global environment. That is, study will try to assess the last six-year financial, operational performance of global super major oil companies and thereby will try to give an assumption on the business sustainability.

1.1 Purpose of thesis

The main purpose of this study is to provide a comprehensive information on performances of integrated oil and gas super majors through analyzing their financial, operational data. One of the underlying reason to write this thesis is that with given importance to the global economy and to daily life, there is still lack of knowledge about the energy industry, especially in oil and gas industry. According to recent survey conducted by University of Texas, it has shown, in general, public had been misinformed about of what influences the prices of energy in our community (Simkins, 2013). This indeed unfortunate because learning basics is crucial in making important decisions regarding energy consumption. However, such misunderstanding in some sense can be justified since most of books written are contains only technical guideline for narrow audience. Therefore, the purpose of this study is to give nontechnical character and convey the only basic knowledge about the industry.

Taking into account of the industry's straightforward relationship with the world economy, the recent evolution in the oil price and uncertainty in the global economy have raised numerous questions about the competitiveness of oil and gas industry, especially among the public. Moreover, considering of today's economy, for the industry to go ahead is questionable unless it get ability to convert today's challenges into opportunities. Hence, this current study is encouraged to determine of whether Oil & Gas industry continue to be enabler of economic growth or become constrained in the near future.

Finally, the more general desire for writing this thesis is to be able to analyze an existing theoretical and practical framework for evaluating Integrated Oil and Gas companies' performances and to improve the scope of accurate evaluation by applying the industry specific metrics along with best practices in valuation method such as Data Envelopment Analysis (DEA).

1.2 Research Methodology

Since the main objective of this study is to make an analysis of Integrated Oil and Gas companies' performances, this thesis found it necessary to conduct quantitative research methods along with comprehensive theoretical background on the global oil and gas industry. Theoretical part takes most of this study. Since the industry is very complex to analyze, acquiring key industry concepts is essential and used to be as a background for the following final - quantitative part of the research (Financial, Energy Ratio and Data Envelopment Analysis). In general, the theoretical section will cover different areas with implication on strategic management, economies and even on accounting.

First, study starts with industry prime where its business structure, working process are discussed. In this direction, study will also try to address the challenges today global industry face, by predominately analyzing secondary data from different published articles and financial agencies reports. Then, according to "Porter's Five Forces", industry's competitive environment analysis will be implemented. It will help to evaluate how the competitive situation in the industry influences the ability of companies to sustain profitability. After, the rest of discussion will focus on evaluation methods - Financial, Energy Ratio analysis and Data Evaluation Analysis (DEA) - where applications and limitations are described.

In the final, quantitative section, the emphasis will be made on computing Financial and Operational ratios finalizing with DEA. Section will reflect about twenty-three types of ratios where companies' financial and operational performance will be assessed by comparing between peers and industry benchmarks, relative to each year. As for study, there are four international oil companies have been chosen. They are Exxon Mobil, Chevron, British Petroleum and Royal Dutch Shell. For conducting study, the information borrowed from companies' annual reports and from additional accounting disclosures of 10-k and 20-f report that are required by the FASB (Financial Accounting Standard Board), SEC (Securities and Exchange Commission) and IASB (International Accounting Standards). All reports are from companies' official web sites and reflects data relative to six-year period, from 2009 to 2014 year.

2. LITERATURE REVIEW

Since the beginning of global financial recession from the second half of 2008, worldwide oil companies has been facing tougher financial environment, which had shown plunging energy investment, weakening final demand and falling cash flows. At the same time, along with crisis the oil and gas industry had undergone through series of events associated with many environmental, social and political issues such as oil spills in gulf, civil unrest in some regions as Middle East and Russia etc. To this day, in consequences of such instability in the world, overall the oil and gas industry has been increasingly popular subject to study.

After a search for previous literature concerning to the industry, it seems that the most prevalent topic was "Crude oil price". The main subjects for discussions are Effect of the Crude oil prices on the macroeconomics, the impact of the stock return on market return. The reason for studying oil price is indeed justified because dependency on oil has left global to be vulnerable to macroeconomic economic side effects. The dependency became clear with the Major oil Shock; the oil crisis in 70s, which period had serious influence on the worldwide economy and especially on the economy of the USA, Western Europe and Asian Pacific countries. Therefore, an interest into oil and gas industry as well as the commodities effect on the economy and finance started just after the crisis with Chen (1986) being one of the first to look into the effect of crude oil price on stock prices of oil producers. Hamilton (1983) looked into the effect of crisis on oil prices and discovered that oil price surged after almost every crisis since the Second World War.

Today the impact of crude oil price on the economy known by numerous studies each developing a special relationship between prices, economic and financial factor. It found that increase of 10% per barrel in price of crude oil affect the world GDP negatively by at least 0.5 % (IEA.2004). Similar studies has also been implemented by Jean (2009) and Zoheir (2014) in their analytical reviews and in analysis of the behavioral responses of macroeconomic agents to price volatility where it reveals that volatility has several damaging and destabilizing macroeconomic impacts that build fundamental barrier to future economic growth if left unchecked.

On the other hand, concerning to oil producers, it was noticed that limited studies are devoted to the integrated oil companies' performance and their relative valuations,

especially for crisis period. In performance evaluation of integrated oil companies Lameira (2012) and Olivier (2014) conducted studies by applying standard financial ratios and multiple regression analysis in relation to the price volatility in which study it has shown a negative effect of financial crisis on the international oil companies in Eurozone. As concerning to valuation of super major oil companies, it also found that studies are mostly relied on commonly used valuation methods. For example, one of such studies would be analysis by Pirog (2012) and Irakli (2008). Where in evaluation of companies performance, the quantitative approach is emphasized mostly by common financial metrics (Weighted Average Cost of Capital, Discounted Cash Flow, financial ratios), which according to Einav E (2014) the performance of Integrated oil and gas companies should not be relied solely by statistical, economic or by financial tools. The same prospects shares also Simkins B.J (2013) where he believes that "any other analysis in the oil and gas industry is grossly inadequate unless the energy ratio analysis is implemented". The reason is that the crucial component in Exploration and Production companies' is their reserves and, therefore, measuring their reserves is of great importance in assessing the corporate performance. Therefore, research would gain more sense if both financial and Energy ratio analysis applied and backed up by DEA method, nonparametric technique, to measure relative efficiency of all E&P companies by encompassing their financial and operational aspects. The reason to include DEA comes from the fact that this method also found to be critical in analyzing different industries across different counties to uncover the core efficiencies of entities. In addition reviewing the previous literature, the application of this method to energy economics is however, cited by few authors (Ferreira R.P, Luiz E.F, 2010; Bastos R.C, 2014) where research was not much gave an emphasis to recent economic downturn and its impact on major oil and gas producers.

Based on overall reviews, following study found interesting to investigate international oil and gas companies' financial and operational performance along with their efficiencies in crisis period since previous studies organized much on the effect of financial crisis around companies on specific area with common valuation methods. Hence, study came up with the following research questions:

RQ 1: What is the performance efficiency of major oil and gas companies?

RQ 2: How recent global crisis affected the global integrated oil and gas companies?

2.1 Petroleum Industry

Petroleum industry is one of largest and most complex industry around the globe since it reflects a peculiar model of business incorporating itself politics, technology, experienced personnel and environmental protection. This model imposes major challenges on oil-producing companies' profitability and sustainability because they must assure that newly discovered resources used in economical and sustainable manner where technologies are and cost efficiencies are key aspects (Dejan. T, 2009). The industry essential for everyone and provides with outputs like transportation, heating and electricity fuels, asphalt, lubricants, propane and many other common commodities from carpets to clothing. The most crucial factor to mention is that oil and gas plays important role in maintenance of industrial civilization therefore it is a big concern for all nations. Since the energy is the central factor of continuance of daily life, it is not surprising that energy security has become a central focus of nations' foreign policies around the globe. The supply and demand of oil and gas is a constant concern of the administrations of both oil importing and exporting nations. In global petroleum industry, the term of "energy security" today is the focal point in the international energy market since today's conflicts, instabilities and poverties within the world's resource-rich countries causes concerns over reliable resource availabilities (Marta T, 2009).

Accounting for a large percentage of the world's energy consumption, ranging from a low of 32% for Europe and Asia, to a high of 53% for the Middle East, the industry has also great influences on the national security, geopolitics, elections and national conflicts (Moffett , 2011). The very political success or failure of any ruling regime and the very survival of its citizens are dramatically affected, not simply by the mere possession of oil, but by effectively controlling the price of the industry's main outputs. One thing that nearly all governments seem to agree upon is the importance of maintaining stability in both the market and ability of oil to reach those energy thirsty nations that it serves. As far as concerned, oil price and natural gas today are the most watched commodity in the global economy. Since the oil and gas are major industry driven commodities, thus far numerous in empirical results suggest on direct detrimental effects on economies. Among the perfect examples, are studies implemented by International Energy Agency; suggesting on 10 percent increase would negatively affect by 0.5% percent in country's GDP (IEA, 2004). In addition,

recent study shows that fluctuations over price represents fundamental barriers to economic growth, as a result of its damaging and destabilizing effects on macro economy. Through causing economic uncertainty, price fluctuations has adverse aggregate impact in consumption, investment and industrial production, resulting in an indirect impact on aggregate unemployment and inflation (Zoheir, 2014). For the last six years, the industry has seen numerous tumultuous events including political, financial, technological and environmental issues. As of today, with the escalating global crisis, the sustainability of the industry is under the question. For that reason, the industry continues to be the subject for numerous studies.

Overall sector is considered the most difficult to analyze because there are numerous companies competing for scares resources around the globe including state based companies and still they are represents entities with different focus and with different sizes. Given the importance of huge market capitalization of oil exploration companies, they are the much subject analysis of researchers. Even though, several valuation methods evolved, it appears that it still has a gap in studies. Because oil and gas companies are burdened by host of sector specific-problems; high exploration investments with uncertain returns and long turnaround times, a very diverse tax environment and volatile of oil price which underlines most assets' values (Anton. H, 2011). Moreover, it is hard to one to make the accurate quantitative estimations of global oil resource base and industry's ability to produce and supply the commodity. Because the underlying reason is due to the factors such as secrecy policies on oil reserves and production data that national companies have adopted, impressions over the amount of recoverable energy sources, large fluctuations in annual key producing countries, technological progress in production (Kjarstad and Johnson, 2008). In addition, it may be challenging for any interested party who does not have experience in energy industry. Because industry is teeming with different terms with in its working process and, therefore, while analyzing them it is important to gain at least the basic knowledge about its working process, structure of the industry, risks it faces and competitive environment where it operates.

2.2 Historical background of the industry

From historical perspective, oil industry considered as the industry with millennial history. For a long time fire was the primary source of energy, but as people grew more intelligent, they began to search for a new ways of lightening and energy. Actually, the first using oil started more than thousands of years back. Sipping out from the ground oil were used to make boats waterproof in the Middle East and also used as medicating and painting tool in different cultures (Alphonsus F, 1991). The history of oil also mention the Greeks, who also mastered oil to make an awesome weapons in 673 A.D, which famously known as "Greek Fire". They used compressed oil to shoot enemies' vessels, which caused great damages to ships, making them to be immensely powerful in waging wars.

However, the modern history and the early stages of development of the industry quite often refers to the Colonel Edwin Drake, when in 1859 he struck oil in Northwestern Pennsylvania. During that time oil would began to be used as an alternative for whale oil as lightening source for lams and scientists began examine oil other possible uses. In 1850, Samuel M. Kier developed the first method in distilling crude oil into the product "carbon oil", the new products that did not give off the black smoke, which began replacing whale's oil. However, in this period, developing crude oil would be expensive and no one knew how to extract it in large quantities. But in April 1859, coming up with his "engine house" Colonel was the first pioneer who could extract crude oil in a large quantities, giving 10-40 barrels per day in which time the first modern petroleum industry was born (Denis C, 2011).

Soon after successful efforts by Colonel, the oil rush began throughout the Western Pennsylvania. Within 15 month there were created about 75 oil wells. However, during that early stages industry was disorganized and moderately successful. Because most companies were unsure and had limited knowledge in production and still, it would take a year to build refineries to cope with the first flow of oil (Moffett, 2011). However, this situation would change with coming of John D. Rockefeller, a successful businessman who also invented a way to refine oil more efficiently and with lower cost of production. By combining 39 affiliated company companies into "Standard Oil Trust" in 1882, he also considered as person who laid the first brick in the industrial organization. His actual goal was not to form a monopoly, because these companies already were controlling 90% percent of kerosene market.

The real aim was the economy of scale, incorporation of all companies into one management structure. In doing so, Rockefeller set the first stage for what today most historians believe as “dynamic logic” of growth and competition what drives modern capitalization.

In 1901, the new phase of industry began with discovery of oil in Spindletop, East Texas. Crude oil, which previously had been used as mainly for lamps and lubrication, after huge oil reserve discoveries in Texas, it would became as the major fuel for new inventions such as airplane and automobiles. In the first year alone, Spindletop produced approximately 4 million barrels of oil equivalent; in its second, production would rouse up to 17.4 million. In addition to driving the price of oil down and destroying the previous monopoly held by John D. Rockefeller and Standard Oil, Spindletop brought a new era in Texas-based industry, and was very influential in the modern history of petroleum industry. The Spindletop was the earliest beginnings of new companies such as Texaco, Amoco and Humble oil.

2.3 Formation of crude oil and natural gas

Geological studies indicate that oil and gas are originated from organic materials such as plants, animals and microorganisms together with sands, slit and other sediments, which formed the rocks among the earth crusts. During the formation of layers of rock, decaying organic matters are build up among the rocks through specific conditions, such as high pressure and temperature, and they are converted into hydrocarbon composition. In creation of oil and gas, high temperature is by far the most crucial factor. Because heat within the earth layers increases with depth and for creation of crude oil the minimum temperature is 15 ºF with approximately 7000 feet below the surface of the earth. As for natural gas, the heat level is about 300 ºF (Moffett, 2011). Since the oil and natural gas are organic substances formed in the rock beds, they also tend to mitigate in upward direction. This takes place from the source bedrocks through permeable porous rocks. The upward movements of substances continues, until the oil and gas are trapped under cap rock (or impermeable layer) which prohibits the substances from raising further. Within this trap, oil and natural gas flow to the top, above any water, separating according to density. Since gas is the lightest substance, it rises above the oil by forming the gas cap. Oil, in turn, finds itself in the middle position because of less density than water (Hilyard J.F, 2012).

2.4 Exploration and Production (E&P)

Companies involved in oil and gas exploration and development are engaged in a high risk-risk game, with 10 % percent of success in finding oil reserve (Ian L.1997). Because drilling a single well may reflect a huge cost for entity. For example, the capital investment needed to develop a medium-sized offshore field can cost up to $1 billion dollars, depending on depth of water, well and other geologic parameters. In addition to geological parameters and related technical assessments, companies also have to deal with obtaining right to explore and produce oil and gas.

The ownership or control of an area interest often rest with government. Therefore, in order to start exploration, companies have to enter to business arrangements, defining the rights and obligations of all parties. In terms of risks involved in operations, generally, companies establish joint ventures or joint operating agreements, with one entity in the partnership assigned for supervising the major operations. Actually, explorations of offshores and remote areas often implemented by large corporations or national governments. In most nations, the government often gives a license to explore, develop and produce its oil and gas resources, where license controlled by the oil ministry. The license on Exploration and Production generally awarded in competitive bid rounds. There are three licenses are commonly used: production sharing agreement, service and production contract. Production-sharing agreement is the term where company takes financial, technical risk in exploration and development. In case of successful efforts, company takes profit from the sale of produced oil. Service contract, in turn, represent a business agreement where company is paid only for producing oil and natural gas by host government. Lastly, production contract, the agreement in which company takes existing field and paid upon production improvements (Hilyard J.F, 2013).

Once, rights for exploration are obtained and all business agreements are settled, exploration activities begin on oil and gas promising area. If in the past companies did exploration according to seepage the surface but today, they employing numerous valuation methods in determining reserves. Among them are Geologic method (sampling and mapping of formation of rocks), Geochemical method (sampling the earth surface), Geophysical method (analysis of subsurface of strata depths).

As long as potential reserve is found, drilling process starts. Actually, drilling process represents similar process as hand drilling, where drilling pipes are attached to each other and entire construction rotated to make oil and gas well in cap rock. Once drills reached the deposits, pumping process comes to start. In case of not finding a valuable quantity in resource, the well would be considered as a "Dry Hole", term that is more commonly used in the industry.

Hence, it is important to know that for oil and gas industry, finding and replacing reserves means a bottom line and entails great risks for the business to measure market value reserves. In addition, finding reserves involves complex combination of not only technology but also the price because of possibilities of economy to develop them. The best example of how it is difficult to measure would be oil sands in Alberta, Canada, where sands are deposits of bitumen in which area oil can only flow provided it heated by light hydrocarbons. Although, the reserves considered as the second biggest in the world, after Saudi Arabia, before it had been considered as none economic to develop. The region had valuable only in 2000, with new technology innovations and price raise. It was estimated that in region production can reach 3 million barrels per day by 2020 and probably can reach up to 5 million barrels per day in 2030 (Moffett, 2011). As of today, oil industry moves more and more difficult oil and gas deposits today decisions related to exploration and production are still very complex because of high number of issues involved around the exploration process. While geological process represents uncertainties with respect to structure, reservoir seal and resource charge, the economic process is implied by related costs, probability of finding and developing economically valuable reserves, technology and crude oil price (Saul B.S, 2009).

2.5 The industry segments

Just like as any other businesses, oil and gas industry has various activities, which are divided into three distinctive segments. They are upstream, midstream and downstream segments.

The Upstream level mainly involved in exploration, development and production of renewable energy. That is, the main activities include the searching for crude oil and natural gas, drilling wells and consequently producing of that wells. This level reflects the very core of the industry since it determines supply of energy resource. Moreover, unlike the midstream and downstream segment, upstream divisions reflect a long-term

process and exposed to numerous governmental regulations. The Basic reason is that, exploration and development take place where resources are located and oil ownership regimes are based on state sovereignty. Therefore, companies have to deal with complex government policies and regulations. The private oil and gas companies are often granted "developments rights" either through negotiations or bidding. The objectives here for oil companies is maximizing profit whereas for government is revenue maximizing.

The midstream division, in turn, refers to activities such as storing, trading and transporting of produced crude oil and natural gas. As long as resources produced, crude oil transported from wells to refineries whereas natural gas transported through pipelines. Since the crude oil only has value when its refined, transporting it to refineries is major task for midstream level. Transporting oil and gas generally implemented through seaways, railroads, tank trucks and pipelines. However, among the complex terms, the most difficult tasks involved in construction and management of pipelines. Because it coupled with geopolitical issues and involves a process which takes many years or even decades to develop. Pipelines that cross national borders are enormously complex to negotiate and build. The foremost reason is that countries with crossing pipelines over their territory use them as bargaining chips. Moreover, along with constructing complexity, pipelines are often the subject of sabotage from terrorists. The countries such as Nigeria and Iraq are would be an illustration of oil and gas theft from pipelines and associated environmental and safety problems, which no longer surprise for daily news.

The downstream division, mainly deals with refining of crude oil and natural gas, converting raw products into the final products and it touches the customer by providing products such as petroleum, diesel, lubricants and other petrochemical products. Generally, downstream level in the industry has always been volatile and complex in financial terms. Since the primary measure of industry's profitability is refining margin, which represents difference in price of oil and end - product, instability in oil price often entails difficulties for downstream segment's profitability. In practice, these fluctuations in oil price has not always been matched with to changes in price of finished products. Thus, it inferred that downstream represents a segment with low profit margin.

2.6 Players in Oil and Gas Market

Apart from divisions classified above, there is also another important thing is to mention-players in the industry market. The reason comes from that the global oil and gas industry are made-up of thousands of firms of all shapes, sizes, capabilities and recognizing them is important while analyzing global energy market.

Taking into account of today's different structure of the industry, compared to previous century, it is important to understand organizations-in who they are, what they do and what they want. The following chart shows a list of top 10 largest oil and gas companies by market capitalization. The list both includes International Oil Companies (IOCs) and National Oil Companies (NOCs) and shows a global nature of the industry, especially in terms of production and ownership

Figure 1: National & International oil companies based on market value in 2014

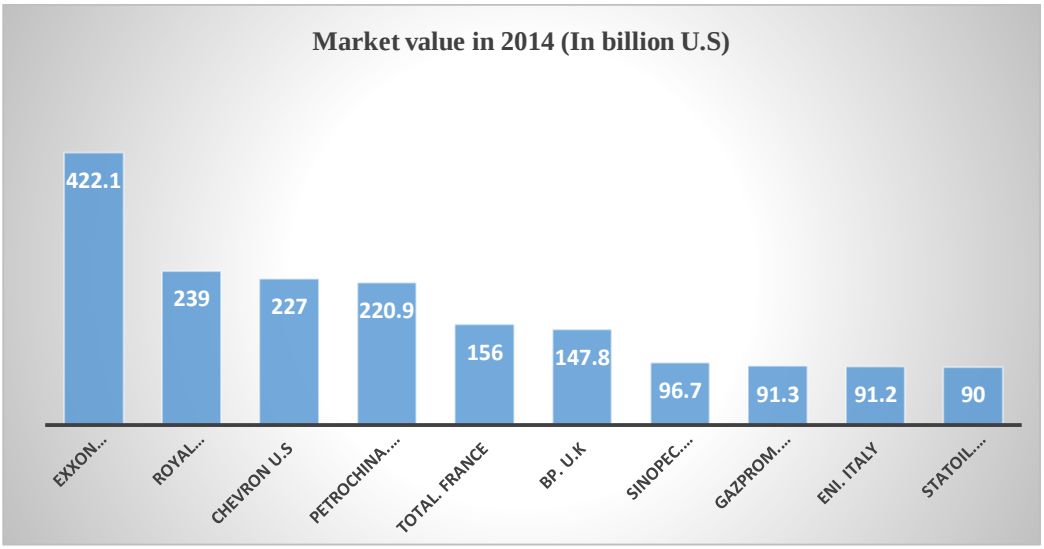


Table 1: NOCs & IOCs market values in 2014

Companies	Exxon Mobil1	Royal Dutch Shell1	Chevron1	PetroChina2	Total2	BP1	Sinopec2	Gazprom2	Eni2	Statoil2
Market value (billion $)	422.1	239	227	220.9	156	147.8	96.7	91.3	91.2	90
NOC/IOC	IOC	IOC	IOC	NOC	IOC	IOC	NOC	NOC	NOC	NOC

1. IOC: International Oil Companies

2. NOC: National Oil Companies

Source: Statistics portal (http://www.statista.com/statistics/272709/top-10-oil-and-gas-companies-worldwide-based-on-market-value/

IOCs-Companies that compete around the globe and defines the largest oil and gas segments. More generally, they often referred to the largest oil and gas companies that compete globally and often cooperate with national oil companies in the host country.

In the mid-1960 and 1970, IOC's had been dominating global oil and gas market. Based in U.S, U.K and Netherlands there were only seven international publicly traded oil and gas companies, which group famously were known as "seven sisters". They were Standard Oil of New Jersey (Esso), Standard Oil Company of New York (Socony), Standard Oil of California (Socal), Gulf Oil, Texaco, Royal Dutch Shell (Netherlands), Anglo-Persian Oil Company (UK).

However, over the next half century as consequences of acquisitions and mergers "seven sisters" have been transformed into today's known companies as Exxon Mobil, Chevron, Royal Dutch Shell and BP;

- Esso became Exxon, which renamed as Exxon Mobil after acquiring Mobil, formerly known as Socony.
- Having acquired Gulf Oil in 1985 and Texaco in 2001 Socal became as Chevron

In 1935 Anglo Persian Oil became Anglo-Iranian and then British petroleum in 1954. And, 1998 after acquiring Amoco (Formerly known as Standard Oil) it took its final name BP.

Once dominated over 85% percent of global oil and gas market, today, however, "seven sisters" and their successors are challenged by OPEC cartel and national companies.

NOCs- National oil companies are entities that owned and controlled by Government. Many of them are owned by state and partially owned by investors. NOCs are usually an arm of a government industry, such as ministry of industry or industry of national resources. Generally, NOSs operate in the home country. However, companies like Gazprom and Statoil operate globally across multiple sectors much like IOCs.

Initially, as a response to the power of the International oil companies and concerns over energy resources, the National Oil Companies came to exist by countries who took actions to create or sponsor new entities in the beginning of 1960. However, in 1973 because of Arab oil embargo, which shocked global oil market, the initiative had gained additional momentum, which initiated creation of OPEC and vast

nationalization of national resources. Since then, the growing trend of national companies has been gaining significant concerns for IOCs. Because, upon analyzed of today's energy industry, even though, companies like BP, Chevron, Exxon and Shell are among the largest in the world, they do not rank among the top 10 of the world's largest oil and gas firms measured by reserves and represent a small group in overall energy market. The role of NOCs in the future is unclear. The reason is that, according to the analysts, some see national oil companies as inefficient and corrupt arms of government that will never compete in true economic sense. While other argue that NOCs are in transition period and would become competitive forces to be reckoned with. However, regardless to what happens, as of today, national oil companies and their sovereign owners control about 90% percent of the world's oil and gas reserves (Simkins, 2013).

2.7 Major Differences between IOC and NOC

Apart from different structures among oil and gas companies, there is also crucial to understand the main differences between them. The only way to do so is consider their strategic goals.

As publicly traded, the integrated oil companies must be responsive to the expectations and demands of their private shareholders. This expectation comes from "wealth creation" which means the IOC must be concerned of the cost control and financial performance. Being ran and owned by private individuals, they are private industry concerns not a government. On the other hand, national oil companies represent entities with public policy goals oriented which assumes objectives maintaining competitive market helping to sustain an economic growth etc.

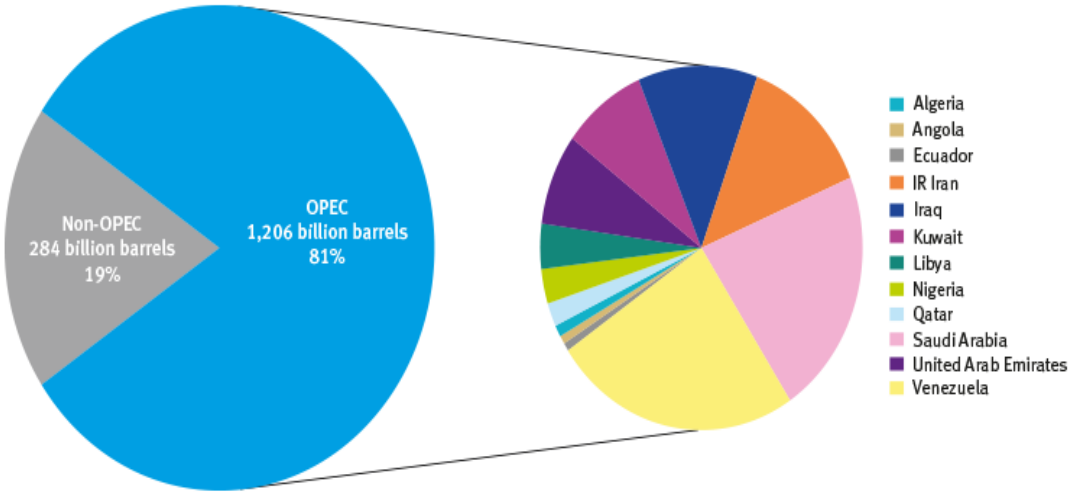
In general, view of difference between IOC and NOC is that IOC are in search of upstream opportunities and access whereas NOCs need technology, expertise and access to intellectual properties. Thus, it can be inferred that the objectives of International oil companies are clearly narrower and more focused than those of National companies (Zanoyan, 2002)

2.8 Organization of Petroleum Exporting Countries

Since the current study is devoted to analyzing the performance of major Integrated Oil and Gas companies, it is also essential to understand OPEC. Especially, the most worth here to consider is their power and influence in today's global energy industry and to which extend they can be challenging for today's International Oil Companies.

Founded in 1960s with the objective of shifting bargaining power to producing countries and away from the large oil companies, Organization of Petroleum Exporting Countries is the major force in the global trade of oil and represents governmental global scale. OPEC is an intergovernmental entity initially created by countries; Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. Today, organization consist about 12 countries. According to oil reserves estimations, its member countries are said to be the biggest countries with significant reserve bases, especially Middle East. The estimation has shown that OPEC today prevails more than half of world oil reserves amounting 1.206 billion barrels, which is 81% percent of total reserves (Hylyard, 2012).

Figure 2: OPEC share of world crude oil reserves in 2013



OPEC proven crude oil reserves, at end of 2013 *(billion barrels, OPEC share)*

Venezuela	298.4	24.7%	Iraq	144.2	12.0%	Libya	48.4	4.0%	Algeria	12.2	1.0%
Saudi Arabia	265.8	22.0%	Kuwait	101.5	8.4%	Nigeria	37.1	3.1%	Angola	9.0	0.7%
IR Iran	157.8	13.1%	UAE	97.8	8.1%	Qatar	25.2	2.1%	Ecuador	8.8	0.7%

Source: OPEC annual statistical bulletin

The aim of OPEC is "to coordinate and unify the petroleum policies of Member Countries and ensure the stabilization of oil prices in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital to those investing in the petroleum industry".

However, despite of their responsibilities in the major oil exporting countries business, OPEC often has been criticized because of their ability to determine the price and production in global oil commodity. One of the main criticism is that their Oligopoly structure which is similar to Monopoly. This means that there are few sellers in the market. In regards to OPEC, it means there are not many oil producing countries. Hence, of such power prevailing over main energy market it brings a lot of debate about dishonesty and manipulation on crude oil prices and production. For example, for keeping prices from falling down OPEC must decline production and has to set ceiling quotas for each country. However, this may go against some members because they need increase revenues and consequently, they may cheat on production by producing more outputs. Maintaining the discipline is quite difficult in OPEC. In case with Venezuela would be the best illustration of biggest cheating on quotas in 1990s.

In general perception, OPEC is an organization with the biggest producing capacity for which today many oil importing countries are dependent on because of prevailing enormously big share of reserves. It often viewed as cartel of oil exporting countries, which has an absolute influence over global crude oil price, through adjusting supplies of oil. The organization is one of the factors in global energy market that defines the oil price in the long-run, production cost and availability of petroleum supplies (EIA, 2008). As organization has the ability to create artificial shortages in oil, by cutting quotas, it may use this mechanism to influence global oil price. Its power is obvious even referring historical event, the Arab-Israel conflict which triggered energy crisis in 1973. During that period OPEC imposed an embargo against the West for supporting Israel and this situation lead world oil price to raise almost fourfold. Moreover, being operated as cartel it sets formidable barriers of entry; exclusive financial requirements, control over resources, patent rights, which impose challenge for Independent publicly traded oil companies to cooperate with.

2.9 Risks Faced by Oil Companies

The oil and gas industry quite complex industry in the world. While analyzing of oil and gas companies, it is critical to know for both investors and analysts the risks industry faces throughout its business life and how they influence on their sustainability and how they ultimately influence their value. It is clear that general business risks applied to every type of stock. However, there are always nonconventional risks existing around the business, which are specific and requires analysts to exert a greater attention while assessing oil companies' performances.

2.9.1 Political risk

Politics is the risk that affects overall industry in regulatory terms. This risk is interpreted when oil and gas companies are covered by regulations, which constrains where, when and how extractions are done. Regulations are actually differ from state from state and mostly arises when a company operates in abroad. In terms of political risk, it is important to know that this type of risk is of exceptional importance in oil and gas industry, which is detrimental for overall business infrastructure, and its uncertainty is determined not only by the government, political institutions but also determined by minority groups and separatists movements. Political risk includes currency convertibility, expropriation, breach of contract, civil unrest, war, terrorism and not honoring of sovereign financial obligations.

Generally, companies most prefer countries with more stable political condition and history of long-term leases, which may turn to be less risky. However, in current global condition there is not much choices are given for oil companies to choose from and sometimes companies are just have to operate in non-OECD countries where the rule of law and the sanctity of contracts not as well developed as in OECD countries. Consequently, numerous issues might raise such as nationalization or shift in political condition, changing previous regulations. Even in the case if the company has chosen the country with more stable situation it might turn in the future to be the object of many regulations because government might change his mind in order to make more revenues from abroad investments. According to recent survey among the political risks factors, today the risk of resource nationalization has been heightened since as of today's difficult economic condition, the most of countries are pressured to nationalize their resources in attempt to secure and support public finance. Among those counties

of high risk nationalization of resources are Venezuela, Libya, Iraq, Kazakhstan, Uzbekistan, Russia and includes even countries which historically been most attractive for FDI (Foreign Direct Investment) such as Indonesia (Ingham, 2013).

Figure 3: Political violence index 2015 year

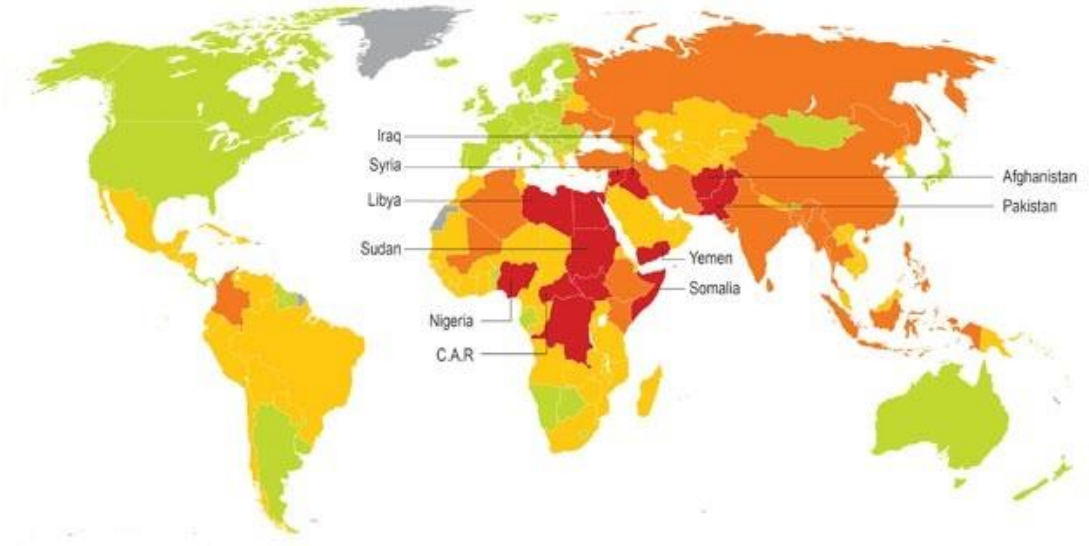


Table 2: Countries with extremely high political violence in 2015 year

Rank	Country	Category	Rank2	Country2	Category2	Legend
1	Irag	Exteme	6	Nigeria	Exteme	Extreme risk
2	Syria	Exteme	7	Pakistan	Exteme	High risk
3	Afganistan	Exteme	8	Sudan	Exteme	Medium risk
4	Yemen	Exteme	9	C.A.R	Exteme	Low risk
5	Somalia	Exteme	10	Lybia	Exteme	No data

Source: Verisk Maple croft, Political risk Atlas (www.maplecroft.com)

Apart from issues of nationalization, with increasing trend in instability in global economy, recent news and articles suggest that political risks in most of oil and gas countries are intensifying. According to survey by "Maplecroft", strategic forecasting company, in its annual edition of "Political Risk Atlas" has shown that in 2015 the escalating level of political violence increased by 25% percent. Today looking at global news, the political risk with unstable government is obvious in some countries, especially for the last few years. One of the example is security concern in the Middle East, especially, concerning Iraq and Syria. In spite of predictions of larger oil equivalents output the region is still stand out of production possibilities and one of the problematic region for many investors and even for local government (Batovic, 2014).

2.9.2 Geological risk

It is true that there were the times when it was easy to get oil and companies had not been worrying about their production. However, today there is a time of great challenges for oil and gas-producing companies since that nowadays many of easy-to-get oil and gas reserves has been depleted and consequently many exploration activities has moved to the most difficult exploration regions with less friendly environment. The case with Royal Dutch Shell Corporation can be the best illustration of geological risk that influenced on overall entity's condition for FY 2012 and when the U.S government blocked the company from drilling in The Arctic region before it provide convincing estimates and plan for exploring and extraction activities.

However, geological risk not only assumes the difficult exploration in harsh environment but also capture an assumption on assessable reserves that might turned up to be less efficient with small deposit in it. As the production moves on to more and more "Difficult" resource deposits, the pace of technological progress is of great importance for overall oil and gas industry sustainability since it means to maintain the production level. Therefore, the decision is the most complex one when it comes to exploration activities in production area where it would have been previously thought as "too impossible" to extract. This situation, of course, places companies to be heavily dependent on the new methods in assessing resource base and in order to mitigate geological risk, experts are now assigned to come up with new software in solution of risk (Chianelli, 2011).

2.9.3 Price risk

However, beside the geological risks, there is another risk exist such as price that goes hand-in-hand with extraction activities. Actually, the price of oil and gas is considered primary factor in decision on whether reserve is economically feasible. Because due to the price volatility in the market some projects cannot go further since it entails e great risks for a business. Moreover, being as prime commodity in the global economy, fluctuation in the price of oil have significant effect not only on industry but also on economic growth and well fare around the world.

Admittedly, the level of oil dependency of industrial economies became clear in 1970 and 1980s, when the series of political events in the Middle East disrupted the security of supply and had detrimental effect on the global oil price (Figure 4). It was a period

where many countries in the world- United States, Canada, Western Europe, Australia, Japan and New Zeeland-, which were heavily relied upon The Middle East resources, had suddenly experienced supply shortage due to Iranian Revolution (Rentscheller, 2014). Since then, due to such exogenous events oil price shocks have been in size and frequency.

Figure 4: Historical oil price volatility

Source: Energy Information Administration (http://www.macrotrends.net/1369/crude-oil-price-history-chart)

As to the situation today's oil and gas industry, sharp decline in price it's obvious compared to past four decades. Since the price respond is quite rapid to surprises in the news, even before actual change occurs, recent trends in economy has impacted oil prices dramatically. In 2014, as consequences of events such as geopolitical conflicts in some producing regions and appreciation of U.S dollar had long-term effects not only on the industry but on macroeconomic condition as well (World Bank, 2015).

It became obvious when Iraq and Ukraine crisis occurred, most of us believed that situation would adversely affect the global oil and gas prices. However, regardless of big tensions in geopolitical situations, according to "World Bank 2014 Report", it became apparent that supply disruptions from conflicts had not been materialized as expected. Because, report states; as advance of ISIS has stalled it became clear that output of oil can be maintained and, moreover, it believed that due to sanctions and counter-sanctions imposed in June 2014, Ukraine crisis had little effect on oil and gas prices.

However, the most destructive factor in oil price was dollar appreciation in the second half of 2014 when U.S dollar appreciated 10 percent against major currencies. This situation tends to have adverse impact on oil prices since the demand can decline as in result of erosion of power in many countries. In addition, empirical estimations, conducted by World Bank, suggest that 10% percent of appreciation can be associated with 10% percent decline in oil price (World Bank, 2015).

In general, according to analysts, if such oil price decline is sustained, it would support activity and reduce inflationary and fiscal pressure in oil importing countries such as Brazil, Indonesia, South Africa and Turkey, to which economic factors they are vulnerable. On the other hand, it would affect oil-exporting countries by reducing economic activity (World Bank, 2015).

Thus through analyzing current condition prevailed in global oil and gas industry, it becomes clear that while oil demands are slow, mainly driven by current economic condition and to some extend of climate policies, the future of oil supply is still uncertain-not least taking into account political unrest uncertainty of discovery new reserves. Consequently, because of such uncertainties the price of oil will continue to be volatile and represents a major risk for the industry (Rentscheller, 2014).

2.9.4 Supply and demand risk

Among the risks discussed before, supply and demand risks said to be very risk for all oil and gas industry. Since the global economy is highly dependent on the energy industry such as oil and gas, the supply and demand issues often rise concerns over "peak production" especially for coming decades. The foremost reason is that making an accurate estimation about global oil reserves almost impossible and more contributive factor might be secrecy policy of many OPEC countries (Bilgiani, 2013).

However, despite of secrecy policy and constrained view on resources, according to International Energy Agencies' report it was estimated that the amount of global oil reserves were 1.638 billion barrels. And, notwithstanding to hard production period in the energy industry, relying on the survey, conducted by US Energy Information Administration, public may in some sense can be assured of future oil production since report suggests that the hydrocarbons expected to be last for at least 25 years (EIA, 2014). However, even though of this fact, it cannot be said that this situation can release the tension in the supply and demand. Because in today's energy industry,

companies are more concerned with other far more crucial aspects of supply and demand than the resource base itself. The majority of them are geopolitical aspects, production cost and new technologies.

Geopolitical aspects is one of the most important aspects in supply and has more influence on oil and gas prices. Because, it is widely known that if the regions, where large resources located, has some kind of conflict, it will definitely disturb production rate and, in turn, affect the supply rate of products. The perfect example is the Middle East region of which continuous conflicts already lasted six years and has been constrained oil supply and contributed to price fluctuations in the energy market.

Production costs is another significant aspect of disturbing supply chain in the oil and gas industry. As of today, according to the World Energy Outlook's recent report the production costs are increasing sharply. Also given the fact that world oil consumption will rise by 56 % percent between now and 2040, the supply is of great concern for many oil-exporting countries (Sarkar, 2014). This all comes from the fact that from year to year newly discovered resources are usually concentrated in areas of difficult to access with challenging prospects of production as well as the increase in environmental regulations (IEA.2013). In addition, taking into account all above issues, this might cut investment rates, to which the industry is very dependent, and, consequently, it may fraught with constraint in major exploration process.

New technologies. The oil and gas industry is extremely technology driven industry and technological advances are of great importance in addressing the world's oil and gas needs. Because innovations and improvements in technologies in upstream segment make possible to extract bigger volumes in reserves which were previously considered exhausted. This, in turn, allows for increase in cash flows from existing oil fields (BP Annual Report, 2009). Overall impression is that technology has significant impact on future development of the oil industry and especially on its sustainability. Because, the world reserves are increasingly depleted and its left industry to be highly dependent on new technologies in exploration and development. Moreover, from the other side, the environmental restrictions, especially today, also entails a great challenges for E&P companies to come up in advanced technologies to reduce harmful impact on environment (IEA, 2013).

2.10 Competitive Environment of Industry (Porter's five forces)

Admittedly, while analyzing a particular business industry it is worth also to know the competitive environment because profitability of any other industry is heavily dependent on its competitive structure. According to Porter's framework, competition emerges not only from established producers who produce similar or same product but also occurs from suppliers of substitutes and from potential entrants into the market. High profitability only is possible if there are powerful barriers and if the company prevails a significant advantages among its competitors. The following investigation defines how competitive structure impacts on ability of oil and gas companies' to sustain profitability now and in the coming future.

2.10.1 Thread of new entrants

Although the oil and gas industry known to be attractive, the thread of entering new competitors is insignificant because of high barriers. The first and foremost reason is that industry involves enormous capital investment which costs cannot be carried by any other potential entrant. Because, enormous fixed up investments needed for developing pol fields or establishing production facilities. For instance, developing new oil fields can cost couple of billion dollars. Moreover, according to international Energy agency, for the last five-year period, due to the global crisis the overall expenditures in industry has surged about 11% percent (IEA, 2013).

Apart from the unit costs, the industry also reflects another barrier known as Economies of scale. With given condition in today's energy industry it can be said that only big companies can take advantage of economies of scale and survive. Therefore, for potential entrants there is almost no chance the industry because entering would mean entailing a great risks.

Third reason is access to a distribution channel, which also creates a huge barrier for entrants in that it requires sufficient investments and time in order to establish a distribution channel. To establish channel, in turn, it involves in construction of pipelines, stations and stores. Therefore, such conditions creates huge barriers of entry.

The ultimate reason rises with different government policies that quite often favor only national companies. Since oil and gas resources owned by state government, they tend to give access only to national companies.

2.10.2 Bargaining power of buyers

Generally buyers are forces that influences the profitability of an industry since they have an ability to bid down the prices or demand by bargaining among the competitors. However, the price in the industry is fixed and determined by global supply and demand relationships. Thus, in the global oil and gas market, sufficient bargaining power can prevail only consuming countries with significant demand rather than individual buyers in the market. These countries are might be U.S, China, E.U and Japan because consuming more than half of the world oil and gas commodities. Even though most recently countries are adopting policies to switch from their heavy dependence from crude oil to renewable energy, the world is seems to be continue to heavily rely on major fossil fuels in satisfying their needs in the years and decades to come and, moreover its demand is in fact expected to raise (IEA, 2009).

2.10.3 Bargaining power of suppliers

Just like as bargaining power of buyers, suppliers also can act as detrimental factor for the industry profitability by raising prices or loosening the quality of products and services they provide. In the case with oil industry, however, the power distribution between companies and suppliers depend on the type of supplier. Form conventional supply of materials and services, it is obvious that oil and gas companies prevail the power. However, when it comes to other type of suppliers, like OPEC countries, who supplies a resource major world resource fields, the bargaining power no doubt belongs to them. Because OPEC countries today prevails most of the world resources and found to be major suppliers of industry ingredient. They are the ones who nationalized oil production in their countries and took advantage of today's global oil market by taking most of international companies business.

2.10.4 Thread of substitute products and services

Typically, among the most influential factors of profitability in any other industry is substitute products and services. Because substitute products and services limit the potential of firms in generating the profit and their source of value creation. However, in oil and gas industry the thread of substitute products is not so high. Because according to International Energy Agency today the most world consumed energy products is still oil, gas and they going to stay as most consumed ones for the following

decades as of today's industry mainly run by oil and gas. Moreover, developing new energy sources for now is still expensive compared to oil and gas.

2.10.5 Intensity of rivalry in the industry

Rivalry, generally emerge when competitors sense pressure or when they the find opportunity to improve their position in the market. However, in the oil and gas market there are different condition to explain rivalry in the industry.

First, the competitive environment can defined as having few oil majors who reflects strong players and several small companies with less power. Today in the market, one can see that bigger competitors often represent international companies with constrained resource but with strong know how in technology perspective. Meanwhile, national companies represent entities that prevail sufficient resource but have shortage in technology. Since, most of national companies are today under OPEC umbrella, they represent a cartel and does not seems to be present significant rivalry. However, with given scarce resource the rivalry is most prevalent among the biggest companies, forcing them to acquisitions and mergers to evade major competitive constrains.

The second condition is industry growth. According to survey, it shows that oil and gas industry is slowly growing industry in the world in which suppliers barely meet the demand. This condition in the industry, in turn, intensifies the competition between producers.

Thus, it can be concluded that overall trend of companies profit sustainability is negative. Because of current global condition, the competition among the oil and gas companies is very high because of depleting resources. Finding reserves getting more and more difficult and require a great technological advances. Moreover, the OPEC countries can be another detrimental factor imposed on the industry, because of prevailing most of resources and restrictive policies upon oil and gas companies.

3. EMPIRICAL STUDY AND FINDINGS

Generally, for performance evaluation of companies there are different assessing tools are exist and each of them might produce different results with different level of credibility. To pick up right and reliable ones is crucial for any conducted study. With all given complexness and eccentricities of the industry, current research found it necessary to conduct financial and operational analysis backed up with nonparametric method in performance evaluation for integrated oil and gas companies. For analysis, study used Financial, Energy ratio analysis and Data Envelopment Analysis.

The following empirical study organized around three section. First section is devoted to disclosure of key studied companies' profiles. Then, the rest three sections are arranged around theoretical and practical framework of given companies performance analysis. In this direction study hopes to bridge theory and practice.

3.1 Companies Selected For Study

Table 3: Companies' key financials for 2014 year ($ millions)

Company	Revenue	Profits	Assets	Market Capitalization
BP	396217	23451	305690	147.8
Chevron	220356	214223	253753	227
Exxon Mobil	407666	32580	346808	422.1
Royal Dutch Shell	459599	16371	357512	239

Source: www. Fortune.com/global500

British petroleum (PLC) is one of the world's biggest integrated super major. The company ranked as the sixth biggest company by market capitalization and fifth largest by revenue. First incorporated as Anglo-Persian Company in 1954, operating mainly in Iran, its expansion begin since 1959 when its operations had spread from The Middle East to Alaska. As of today, the company has been involving in all aspects of oil and gas operations in more than 80 countries with approximately 17800 service stations around the world. Being as integrated oil and Gas Company, its business organized around Upstream and Downstream segments, which are mainly involved in exploration, production, refining, distribution, marketing and trading of oil, gas and petrochemical products. Its main operations located in United Kingdom, Ireland, United States, Africa, Asia and Australia. Today company is listed as sixth largest

major by production level of 3.2 million BOE with total proved reserves of 17.9 billion barrels of oil equivalent (Journal Forbes, 2013).

Chevron Corporation (CVX) an American multinational integrated oil and gas company founded in 1926 as "Standard Oil", which then in 2005 took its current name. Being as a successor of Standard Oil, today company operates in more than 180 countries. Companies operations are divided into two segments; Upstream and Downstream. Upstream operations are involves explorations and productions of crude oil and natural gas: processing, transporting and marketing. Downstream operations whereas consist of marketing, refining and transporting; manufacturing and selling petrochemical products such as lubricants. According to "Fortune Global 500" was ranked as the third largest company in the World. Its operations today organized in regions such as North America, South America, Africa and Asia. Today in U.S company is known under "Texas" and "Chevron" branded names and owned 8050 service stations in U.S and 8600 stations internationally. Top rated and competing among the biggest oil majors, including state owned oil companies, the company production in 2010 has reached 3.1 million barrels per day of refined products such as gasoline, jet fuel and natural gas. Along with its upstream and downstream operations Chevron in recent years has also engaged in other of energy operations including solar, wind, geothermal, hydrocarbon and bio fuels. Today Chevron considered as the second largest geothermal energy producer.

Exxon Mobil Corporation (XOM). Formed by merger of Exxon and Mobil companies, The Company is known as one of the U.S multinational oil and gas companies. The company is considered to be direct descendant of John Rockefeller's "Standard Oil" company which was incorporated in 1870. The company has been divided into several divisions and prevails hundreds of affiliates operating with different brand names such as "Exxon", "Esso", "Exxon Mobil" and "XTO". According to Journal Forbes, it ranked as fifth biggest Oil and Gas Company and the second publicly traded company. Exxon's major activities are involved in all aspects of industry and actually divided into three segments; Upstream, Downstream and Chemicals. Where main operations organized around exploration, production, manufacturing, transportation, marketing of oil and gas production including commodity petrochemicals (olefins, aromatics, polyethylene and polypropylene products). As of now, corporation considered as the company who owns the largest

refineries in the world, with 37 refineries in 21 countries. Also in 2013, the company's reserves were proved approximately 25.5 billion BOE, which production was estimated for over 14 years (Journal Forbes, 2013).

Royal Dutch Shell (RDS) is one of the world's biggest integrated oil and gas company incorporated through merger of "Royal Dutch Petroleum" and British transport trading company "Shell" in 1907. Currently corporation operates in over 90 countries and owns 44000 service stations around the world. The corporation's business activities are organized into four major segments; Upstream International, Upstream Americas, Downstream and Projects technologies. Upstream International units involved in exploration, production and transportation of oil and gas outside the country whereas upstream Americas involved in searching for and recovering oil and natural gas in the North and South parts of America. Its downstream segments engaged in operations at manufacturing, distribution, marketing of oil and gas production. Project Technology ensures major projects and runs research, which drives its innovations in technology solutions, covering all level of business operations. It also helps to sustain its top position among the competitors by ensuring functional leadership in environmental safety across the organization (Journal Forbes, 2013).

3.2 Financial Ratios

When it comes to evaluate financial performance of a company there is a lot to be said since there are numerous financial tools exist and it is not down to earth task for any other interested party. However, the most fundamental and commonly used tools is financial ratios. Financial ratio analysis reflects simply accounting numbers translated into relative numbers and involves an interaction of different financial statements within a company and its peer competitors. These financial statements are Income Statement (summary of revenues and expenses), Balance Sheet (summary of assets, liabilities and equity) and, finally, Statement of Cash Flow (summary of cash inflows and outflows for FY). The basic goal of financial analysis is to obtain the information, which highlights how well the company is running its business as it goes concern. However, while analyzing financial statements, there is also one important thing to mention is limitations of analysis. Since the inputs are from accounting information, there might be some distortions due to some elements involved such as historical cost on inflation. To this topic, however, study will revert later in the following part of

discussion and as for the next part of the study, it first dedicate it for defining about 15 types of financial ratios that will be used in the empirical part of research.

(Example of Income Statement, Balance Sheet and Cash Flow given in Appendixes: A, B, C)

3.2.1 Liquidity ratios

Liquidity ratios are set of ratios that provides information on company's ability to pay off its short time obligations, which are considered to be paid within 12 month. They are good measure of weather a company will be able to comfortably honor its debts as it going concern. When performing basic financial analysis, concerned parties such as creditors or investors, before taking decisions, carefully scrutinize liquidity of company since it defines business risk because of incessant trouble of today's insolvency and bankruptcy problems related to financial crisis.

Generally, liquidity ratios show relationship of a firm's cash and often current assets to its current liabilities and can be measured by dividing cash and other liquid assets by the short-term borrowings and current liabilities. According to generally accepted terms, liquidity ratios should not be less than 1, which would mean that company will face financial difficulties. Therefore, ratios greater than 1 would indicate greater margin of safety that the company prevail to meet its current liabilities when it is due.

In addition to the points listed above, it is important to maintain solvency and liquidity of business in order to sustain growth. Because liquidity affected by profitability of business as its relation with cash flow cycle. According to recent study conclusions, it is found to be that liquidity ratios have strong correlation coefficients concerning a profitability of business. Taking into account of diverse industry, sizes and policies, a liquidity of company's assets can be enhanced through different ways – specific balance sheet, pay off current debt immediately before the balance sheet date, appraising your year-end inventory at high value etc. (Salem, 2011). In the following sections, study will try to put liquidity ratios in more detailed and more accurate fashion.

Current Ratio gives a good view on a company's ability of weather it prevails enough current assets to meet the payment schedule of its short-term debts with the margin of safety for possible losses in current assets. Generally, current asset ratio believed to be the standard measure of any business financial health and expressed as current assets divided by current liabilities. Typically, results, in most cases, expected to be equal to one, which means short-term assets equal to the short-term liabilities.

Acceptable range of values is often between 1.5 and 2 but industry has different criterions according to intensity level of capital of business. Besides, towards the assumptions different analyst might hold different views. Some might say that high ratio values indicate more liquidity and greater ability to cover short-term disruptions while other can argue that high values may show that funds are tied-up and a company may not be earning high returns. That is, a company is not efficiently using its current assets, holding large amount of cash not invested (Clauss, 2010).

Quick ratio, sometimes called as an acid test ratio, takes current ratio one-step further for companies with significant level of inventory and reflects how well they are able to cover short term obligations with current level of assets with less inventory. This is done because inventories are the least liquid asset and for liquidation of such assets takes time (Clauss, 2010).

Cash ratio is thought to be the most stringent ratio. Even though applying the quick ratio, the firm still has to liquidate accounts receivables in order to cover short-term obligation. By leaving out amount inventories and receivables, it goes into more strict view of a firm's most liquid short-term asset-cash and cash equivalents-which is easily used to pay off current obligations. However, the ratio is not so popular in financial analysis because of its conservativeness. Creditors might use it since for them it is important to know of weather an entity has an adequate amount of money to settle its liabilities when they fell due (Ehrhart, 2009). The ratio has no strict norms values and, therefore, in the following calculations study will follow the industry benchmarks specific to researched industry.

Figure 5: Liquidity ratios

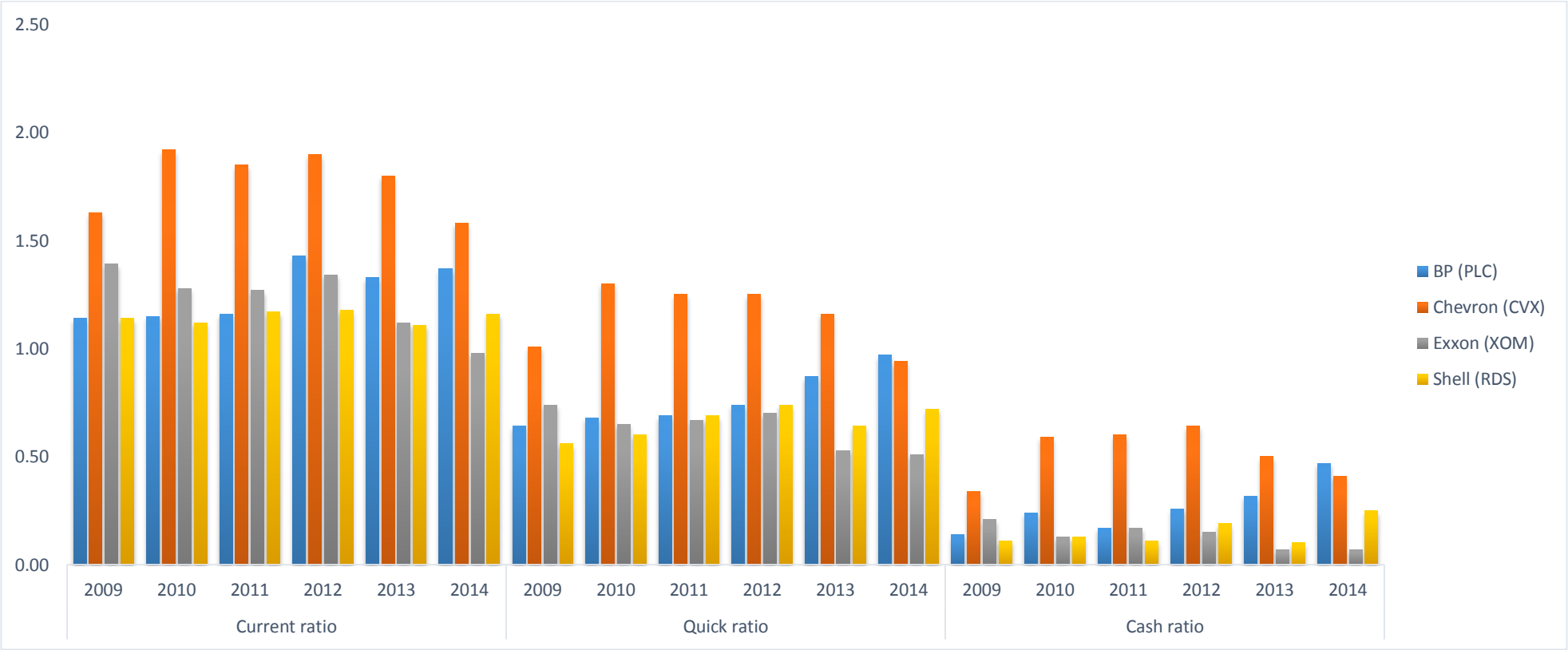


Table 4: Liquidity Ratios: Competitive Benchmark Analysis

RATIOS	CURRENT RATIO							QUICK RATIO							CASH RATIO						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
SECTOR BENCHMARK	1.13	1.16	1.15	1.27	1.15	1.15	1.17	0.67	0.73	0.75	0.79	0.75	0.77	0.74	0.15	0.23	0.20	0.26	0.21	0.29	0.22
BP (PLC)	1.14	1.15	1.16	1.43	1.33	1.37	1.26	0.64	0.68	0.69	0.74	0.87	0.97	0.77	0.14	0.24	0.17	0.26	0.32	0.47	0.27
CHEVRON (CVX)	1.63	1.92	1.85	1.90	1.80	1.58	1.78	1.01	1.30	1.25	1.25	1.16	0.94	1.15	0.34	0.59	0.60	0.64	0.50	0.41	0.51
EXXON MOBIL (XOM)	1.39	1.28	1.27	1.34	1.12	0.98	1.23	0.74	0.65	0.67	0.70	0.53	0.51	0.63	0.21	0.13	0.17	0.15	0.07	0.07	0.13
SHELL (RDS)	1.14	1.12	1.17	1.18	1.11	1.16	1.15	0.56	0.60	0.69	0.74	0.64	0.72	0.66	0.11	0.13	0.11	0.19	0.10	0.25	0.15

3.2.2 Liquidity ratio analysis

As it previously discussed, liquidity ratio analysis is the way of measuring of a company's liquidity position by linking the level of cash and other current assets to the company's current liabilities. Here, study will try to analyze three commonly used liquidity ratios in order to obtain the best view of liquidity position of listed integrated oil and gas majors.

According to the table above, all listed companies has shown relatively good results toward their liquidity positions. All listed above companies has been showing indexes above "1", which indicate the ability of covering short-term liabilities when they fall due. However, for capital-intensive industry indexes of liquidity generally tend to vary significantly from one financial year to another. If rely upon the industry sector benchmark, for given six-year period the best result can be observed form Chevron Corporation with high average current ratio of 1.78 against the industry sector benchmark of 1.17. The lowest current ratio for a company of 1.63 is seen in 2009, which is coincides with first wave of global financial crisis. However, the company has been able to sustain the adequate level of liquidity and, therefore, is likely to enjoy lower cost of capital due to lower liquidity risk. Similarly, the same indexes also can be said about its quick and cash ratios with deterioration for the 2009 same year.

The same prospects can be said about British Petroleum, who also has been able to improve its liquidity position relatively to its peers of like Royal Dutch Shell and Exxon Mobil but slightly below of Chevron Corporation with the average of 1.26 in current ratio. Hence, it can also assigned to its level as a good rate of liquidity.

As for Exxon Mobil Corporation's condition, for the six financial year period company has been showing a negative trend for quick and cash ratio averages of 0.63 and 0.13 which are below the sector levels of 0.74 and 0.22. However, its current liquidity position can be said as good because it is above the sector's benchmark and moreover better than Shell's position and slightly above of British petroleum's value.

When it comes to Shell's liquidity, for the six-year period company's liquidity averages are fairly below the sector norms and, thus, showing negative trend over liquidity position concerning its all above competitors like Chevron, British Petroleum and even from Exxon Mobil Corporation.

3.2.3 Leverage ratios

Leverage ratios (sometimes called as solvency ratios) is useful tool in financial management since it measures how well a company effectively manage long-term debts in order to generate profit. They are metrics used by financials in order to get a view on a company's long-term debt coverage ability and its financing structure. The greater use of debt financing, the greater risk on impending troubles of falling behind or defaults on payments. Stockholders are the first party who are the most interested in this balance since in case of trouble, generally all borrowings from debtors are should be paid first and only after that, anything left is belong to them. Hence, every party desire a company to sustain adequate level of risk (Vause, 2009).

Debt-to-equity ratio. In the leverage ratios, the first and foremost used ratio is debt-to-equity ratio which is used by financials to determine the leverage (gearing) of a company. That is, to which a company financing controlled by which party, weather by creditors or shareholders. It shows the percentage of debt funding for per dollar of shareholders' equity.

Debt-to-capital ratio. Among the different leverage metrics there is another tool for measuring the gearing of a company is debt-to-capital ratio. Typically, debt-to-capital ratio gives an analyst an idea of a company's financial structure, along with insight over a company's financial strength. In other words, it shows the percentage of the company's total capital investments contain of debts. Unlike debt to equity ratio, debt-to-capital ratio makes a comparison of total financing of the firm rather than the equity element.

Figure 6: Leverage Ratios

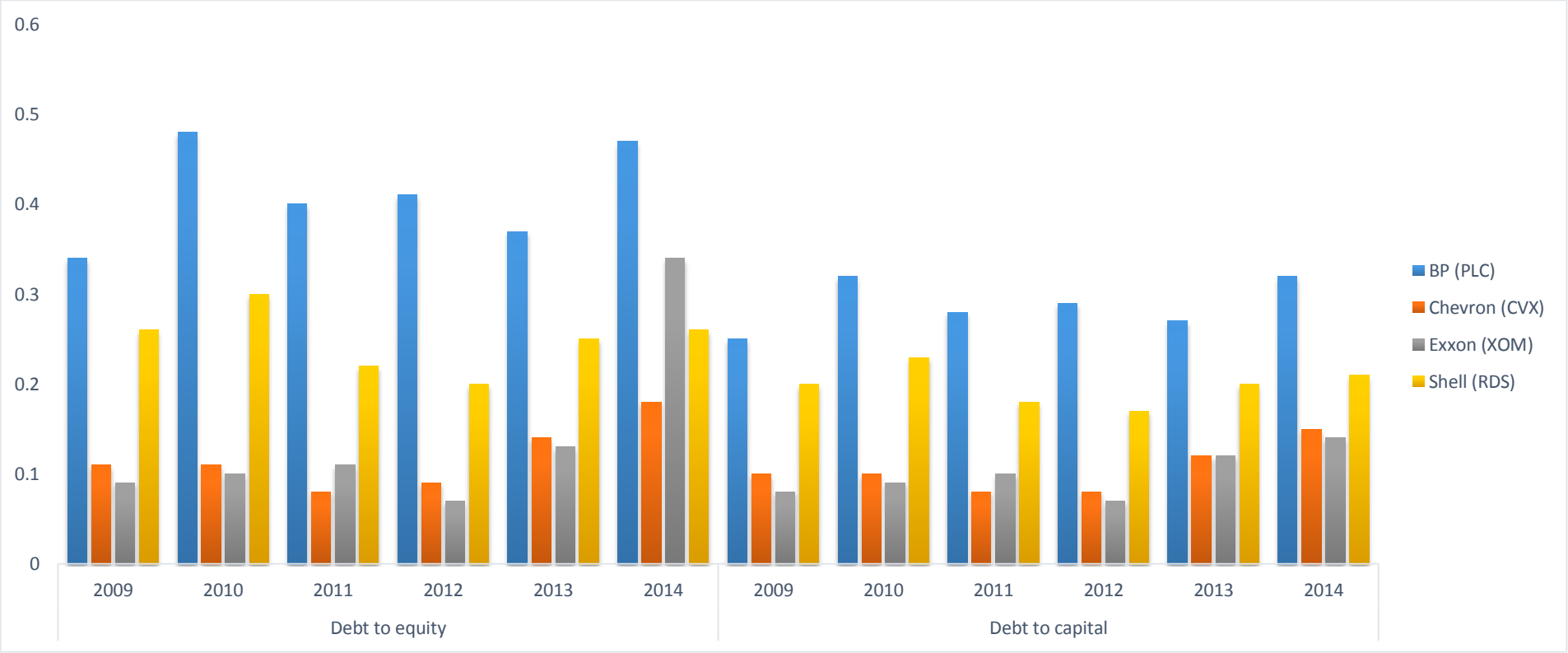


Table 5: Leverage Ratios: Competitive Benchmark Analysis

RATIOS	DEBT-TO-EQUITY							DEBT-TO-CAPITAL						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
SECTOR BENCHMARK	0.24	0.25	0.21	0.20	0.23	0.27	0.23	0.19	0.20	0.17	0.17	0.19	0.21	0.19
BP (PLC)	0.34	0.48	0.40	0.41	0.37	0.47	0.41	0.25	0.32	0.28	0.29	0.27	0.32	0.29
CHEVRON (CVX)	0.11	0.11	0.08	0.09	0.14	0.18	0.12	0.10	0.10	0.08	0.08	0.12	0.15	0.11
EXXON MOBIL (XOM)	0.09	0.10	0.11	0.07	0.13	0.17	0.11	0.08	0.09	0.10	0.07	0.12	0.14	0.10
SHELL (RDS)	0.26	0.30	0.22	0.20	0.25	0.26	0.25	0.20	0.23	0.18	0.17	0.20	0.21	0.20

3.2.4 Leverage ratios analysis

Among the listed above companies, the most outstanding result has shown the Exxon Mobile Corporation. The company has been able to achieve the lowest ratio series; 0.9, 0.10, 0.11, 0.07, 0.13 and 0.17 of debt-to-equity ratio for the years 2009, 2010, 2011, 2012, 2013 and 2014 respectively. Although for the 2014 financial year slight exposure of 0.17 debt is seen, it has been able to sustain the excellent balance of debt relative to equity. Its overall debt-to-equity average is 0.11, which is double less than sector's average of 0.23. Similarly, as to measure of debt financing to overall company's capital structure, Exxon's condition can be said healthy as well. The table shows that for the six-year period the average of debt-to-capital ratio is 0.09 which is above all peers; Chevron = 0.11, Shell = 0.20 and BP = 0.29.

The second best position can be assigned to Chevron Corporation. Table suggest that throughout six-year period, company has also been demonstrating the best results; 0.11, 011, 0.08, 0.09 before 2013 and 2014 year where its debt-to-equities have reached 0.14 and 0.18. This sudden expansion of debt percentage period can be very associated with capital spending of $39.2 Billion, which exceeded total operating cash flow of $35 Billion, indicating of borrowing fund in order to pay dividends and buy off shares back (Chevron, Annual Report, 2013).

In comparison with Exxon and Chevron, however, Royall Dutch Shell Corporation has shown relatively negative trend development of leverage. The results suggest that the leverage of the company has been fluctuating and has shown rather expanding signs. with average debt-to-equity ratio of 0.25 and debt-to-capital ratio of 0.20. From analysis of leverage ratio of Shell, it can be inferred that financial crisis might be the main factor of its performance. However, the very factor of increasing level of l leverage might be explained as net capital investment of over $30 Billion through issuing more long term debts. As company's core activities require heavy investments in PP&E, its capital investments also can be observed even by looking its annual statements where its investments in PP&E constantly rising with 10.6% percent. (Harsh Srivastava, 2012)

Finally, when it comes to valuation of BP Corporation, Table report not so promising results of leverage. According to six-year period, it can be seen that corporation has been struggling with its debt financing. Its debt-to-capital average shows 0.29 percent

relative to the sector's average of 0.19 percent. The average ratio tells us that creditors are providing on average 29 cents for every $1 dollar provided by shareholders. The most high debt ratio of 0.48 can be observed for 2010 year, outnumbering its peers and sector norm. The negative performance can only be explained by recent disaster, associated with corporation that took place in 2010 dramatically changing its financial condition.

The 20 April 2010, explosion on BP's offshore drilling rig in Gulf of Mexico, which today estimated as second biggest disaster after Gulf War in 1991, resulted in death of eleven people and caused accidental marine oil spill in the history of petroleum industry. Consequently, U.S government has named BP responsible for damages (BP Annual Report, 2010). From the balance sheet, according to that period, it also can be seen that the level of liability rose sharply from average 137 Billion to 176 billion. It is obvious what caused such increase in liability- oil spill. Because company had to deal with all cost associated with disaster.

3.2.5 Asset management ratios

Asset management ratios sometimes referred as efficiency or turnover ratios are group of ratios that used to measure how efficiently management is employing its assets, entrusted by owners, in generating revenues. Asset management ratios deal with turnover relationship and express the relative amount of capital used to support the volume of business transaction. The crucial role of ratios is to evaluate strength and weaknesses of a company. If a company prevails enormous investments in assets, then its operating capital will be excessively high, which, in turn, will result in low cash flow and, consequently, its stock price. In vice versa, if the company has not prevail sufficient level of assets it fraught with loosing sales volume. Thus, it is important for management to sustain the efficient level of assets in order to maintain the level of revenues.

Inventory turnover. Admittedly, for most firms inventories are major issues that entails significant expenses. Because funds tied-up in inventories of raw material. Generally, 20-50 percent of manufacturing companies' total asset often relates to inventories. Besides this cost, inventory level, entails additional costs such as purchasing, receiving, storing and inspecting, which treated as administrative or

assumed as the part of general cost. For that reason, to sustain an adequate cost in business process, maintaining inventory turnover is crucial (Ehrhart, 2009).

In measuring and assessing efficiency in selling inventory, inventory turnover ratio is commonly used ratio for management. By gauging a company's inventory liquidity, it also gives an idea of how to increase the sales level. The computation can achieved through dividing cost of goods sold by inventory. Generally, low inventory turnover ratio might imply on inefficiency; obsolescence, overstocking or low sales rate. High inventory, vice versa, signals significant level of sales and high liquidity turnover. When analyzing the indexes of ratio it is crucial to make comparison with main competitors since values tend to vary between industries.

Accounts receivable ratio, defines how well a company using its assets in generating income. In other words, it delivers an understanding of the velocity of company in collecting its credit sales from its customers. The ratio can obtained by dividing receivables into annual sales. As long as, equation calculated, it will reveal the information on how many times account receivables have been turned into cash in a given accounting period. High ratio is favorable since it would be an indication of the efficient execution of credit policies and expeditious turning account receivables into cash. In case with low ratio incurred, it may be assumed that a company has issues or lax in collecting receivables and soon it might struggle to find cash to pay its bills. However, too high ratio is also said to be detrimental indicators in evaluating financial performance. For example, if a company has too high ratio then it might imply on harming its customers by imposing strict and competitive payment terms. Thus, it is important to find balance between too low and too high ratio in order to reach the bottom line of profitability (Horne, 2008).

Accounts payable turnover ratio is also a useful liquidity metric that shows relative measure of net credit sales to accounts payables. In other words, it measures how often a company pays off to all its creditors during the accounting period (typically one year). The formula for ratio expressed as dividing cost of operating revenues by accounts payable. Since the ratio implies on how regularly a company pays off its vendors, it is the most commonly used by creditors and suppliers to decide on whether to grant a company a credit or not. High ratio index is desired in that it implies on timely payment and, thus, showing creditworthiness whereas low index may led to conclusion that firm has difficulties in paying to its suppliers (Gitman, 2014).

Figure 7: Short-term Asset Management Ratios

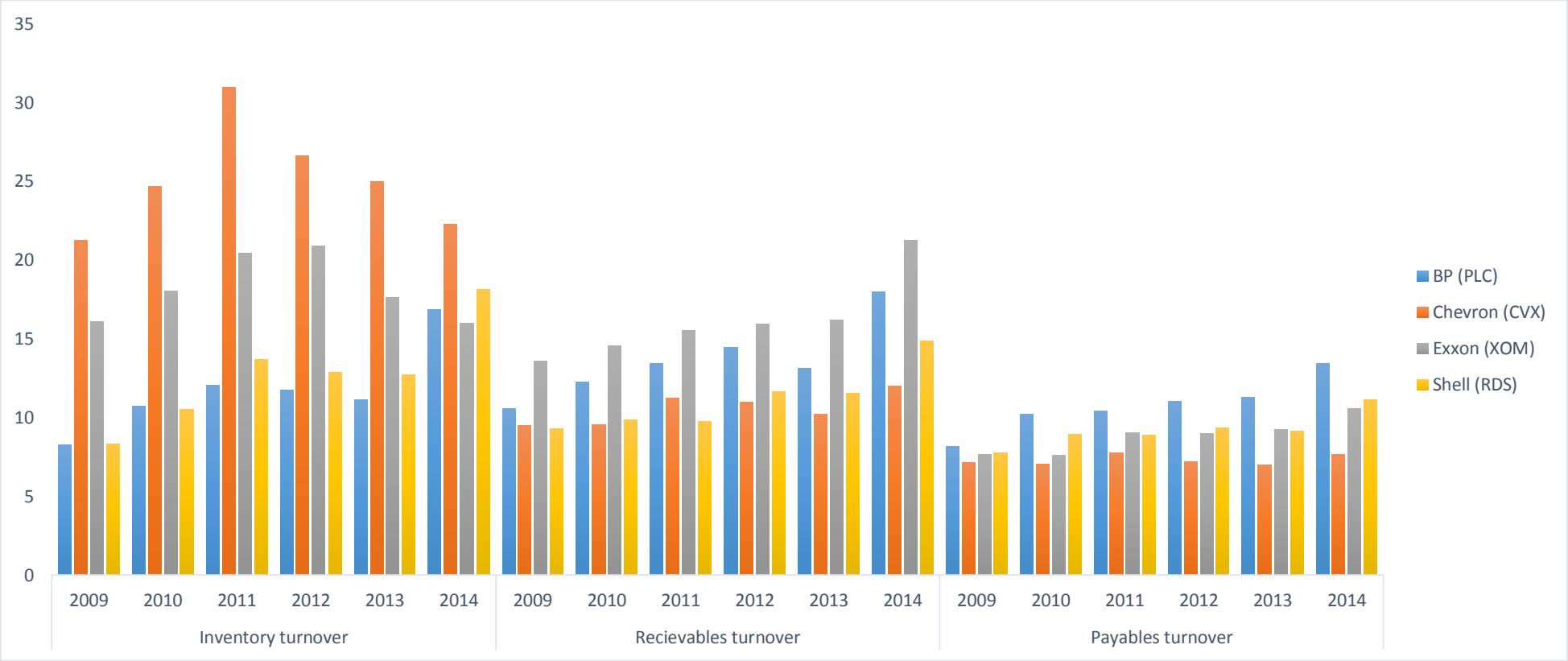


Table 6: Short-Term Asset Management Ratios: Competitive Benchmark Analysis

RATIOS	INVENTORY TURNOVER							ACCOUNT RECEIVABLE TURNOVER							ACCOUNT PAYABLE TURNOVER						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
SECTOR BENCHMARK	11.54	13.94	17.30	15.22	14.24	17.73	15.00	10.90	11.69	12.63	12.73	12.32	15.79	12.68	7.76	8.58	9.29	8.86	8.83	10.32	8.94
BP (PLC)	8.27	10.71	12.07	11.74	11.15	16.83	11.80	10.59	12.25	13.45	14.46	13.13	17.97	13.64	8.17	10.21	10.38	11.01	11.27	13.40	10.74
CHEVRON (CVX)	21.25	24.70	30.95	26.58	24.97	22.28	25.12	9.46	9.55	11.21	10.98	10.18	11.98	10.56	7.15	7.04	7.75	7.17	6.98	7.63	7.29
EXXON MOBIL (XOM)	16.09	18.01	20.42	20.88	17.64	16.00	18.17	13.59	14.55	15.54	15.97	16.19	21.26	16.18	7.67	7.59	9.03	8.99	9.21	10.55	8.84
SHELL (RDS)	8.33	10.48	13.68	12.87	12.72	18.14	12.70	9.31	9.83	9.73	11.62	11.54	14.83	11.14	7.77	8.92	8.84	9.33	9.10	11.12	9.18

3.2.5 Asset management ratio analysis

The most healthy turnover asset management is observed from Exxon Mobil Corporation. It demonstrates that over six-year period, the company has been able to sustain an adequate level of inventory, well velocity of collecting and receiving payments. Even though its inventory level falls behind of Chevron, all three-turnover ratio averages considered a positive. Inventory turnover ratio average suggest that corporation's selling and replenishing its inventory is about 3.17 times faster than that of sector's, indicating it turns its inventory roughly about every 20 days in a year. As concerned to its receivables and payables turnover ratios, corporation can be said as in good position as well, except for 2009 and 2010. However, despite the good performance from overall analysis, there is noted negative trend over inventory management for the last two years. According to recent report for 2013 year, it was stated that despite of relatively good performance over 6 year, Exxon Mobile's worldwide production for both crude oil and gas in the quarter was lower year-over-year. That is, global liquid production in the first quarter of 2013 plunged from 2.192 million BOE a day to 2.148 million BOE. Thus, it may be an answer to the question of why its inventory turnover has decreased in 2013. (Fortune, 2014).

Concerning to BP Corporation, values demonstrated quite an interesting results for given six-year period. Even though, the inventory ratio average is well below the sector average of 14.45 it can be inferred that a company has been able to raise its inventory turnover by 8.56 times more from 2009 to 2014. As to account receivables ratio, BP has been showing relatively good results in processing receivables. The average of 13.64 against sector level shows that company has been able to retain its competitive position and was able to execute efficiently its credit policies. Similar to its account receivable ratio, almost the same trend can be seen in payables turnover. The average of 10.74 suggest that from overall table BP has the highest ratio in contrast to its peers; Chevron 7.29, Exxon 8.84 and Shell 9.18. From comparison, it can be concluded that in average assumption BP pays off 15 earlier than Chevron (50 days), 7 days earlier than Exxon (41 days) and 2 days earlier than Shell (39 days), meaning more creditworthiness over competitors.

In case with Chevron, company has been managing its inventories very successful, with average of 25.12, than its peer competitors: Exxon Mobil, Shell and BP whose averages are 18.17, 12.70 and 11.80 respectively. From the chart above, it can also be

noted that inventory turnover has been increasing before 2011 and then stared to deteriorate up to 2013 year. Because, reportedly, 2013 year has begun challenging for all corporations in which period the energy majors has been suffering from oil and gas lowered prices (Fortune 500, 2013) However, the most challenging situation of such decrease might also serve the fact with prolonged lawsuits associated with environmental contamination in Ecuador region. Throughout that period 2012-2013, chevron had been defending itself from false accusations for environmental and social harms in The Amazon area, in which case Ecuador court had charged $ 18 Billion. (Annual Report, 2013).

As for Chevron's account receivables and payables turnover ratios, company's values can be said as contrasted to sector averages of 12.68 and 8.94. By examining turnover ratios from average basis, one can say that it collect debts 2.12 times less than industry sector, which means it turns its receivables cash once every 34 days in a year whereas for sector it is about every 28 days in a fiscal period. The similar terms observed in its payables turnover. Chevron has been paying off to its suppliers every 50 days in a year while for the sector it takes approximately 40 days, which means less frequent compared to its peers. Overall, by analyzing its payables and receivables, Chevron has shown, however, slightly negative trend. In spite of slightly difference in payables and receivables terms, the company can be assessed as good because of significant development in inventory management.

Lastly, as to Shell Corporation, its results are be contrasted to its rivals. Its inventory turnover ratio of 12.70, it can be measured it takes longer for a company to turn its inventories into sales. Similar to inventory turnover rate, its receivable turnover level is also has shown low recovery rate. It can be concluded that it takes for Shell, along with it competitor Chevron, about 32 days to collect receivables meanwhile for sector, it takes on average 28 days of collecting during the period, which is 1.54 times longer than overall sector's collecting terms. However, as looking to its average payables ratio of 9.18 against sector's average of 8.94, company has shown positive trend in efficiency of paying terms. In spite of having difficulties in turning inventory and lax on collecting debts, Shell's performance, cannot be said as bad. Because it has shown at least, its creditworthiness and timely paying organization, which is a good sign for investors to think that company prevails enough cash at hand.

Net fixed asset turnover. Upon the question of how well a company is utilizing its fixed assets, the fixed asset turnover ratios gives the best answer. The equation obtained through dividing total revenue by the net fixed asset (property, plant and equipment). Financial ratio as net fixed asset turnover is useful financial tool for both investors and managers in making critical decisions and gives objective view of how well a company is running its business in terms of generating revenues relative to its fixed assets. Similar to financial ratios, net fixed asset turnover ratio has various assumptions of too low and too high indexes. For example, high ratio often indicate to assumptions as effective utilization of fixed assets, outsourcing work or selling off some fixed assets whereas low ratio may indicate to overinvestment on fixed assets or obsolescence of plants etc. (Gitman, 2014).

Total asset turnover. In order to extend the general analysis on assets turnover of a company, total asset turnover ratio is also found to be useful for evaluation of a firm's efficiency in utilizing its assets. Unlike the previous ratio, this ratio shows the relative measure of total asset (inventories, receivables and fixed assets) to net sales. The only reason of using both ratios is to pinpoint the bottom line of efficiency. However, the issues can be found in any of above mentioned asset type. Hence, in order to make the more credible decision, it is expedient to make judgments in help with other ratios such as liquidity ratios. (Gitman, 2014).

Figure 8: Long-term Asset Management Ratios

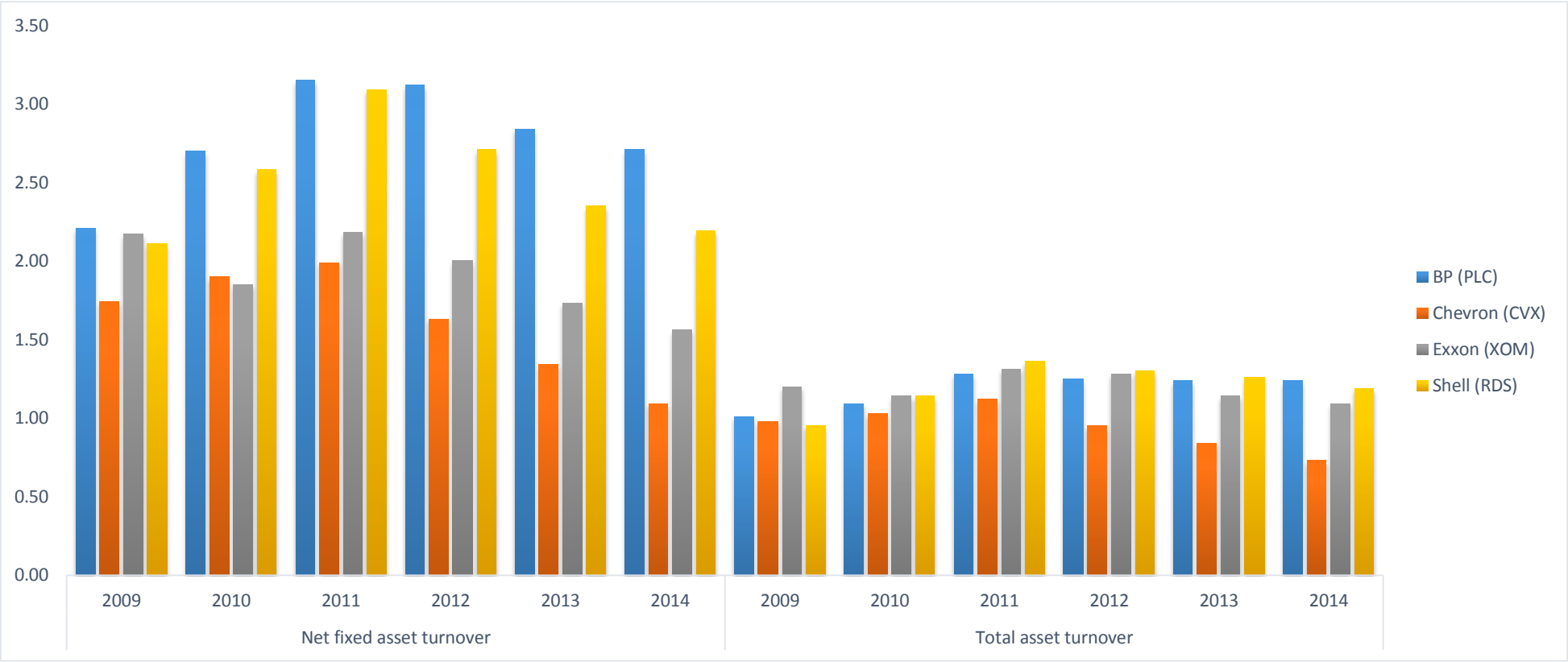


Table 7: Long-Term Asset Management Ratios: Competitive Benchmark Analysis

RATIOS	NET FIXED ASSET TURNOVER							TOTAL ASSET TURNOVER						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
SECTOR BENCHMARK	2.02	2.23	2.60	2.18	1.89	1.70	2.10	1.05	1.15	1.35	1.18	1.10	1.04	1.15
BP (PLC)	2.21	2.70	3.15	3.12	2.84	2.71	2.79	1.01	1.09	1.28	1.25	1.24	1.24	1.19
CHEVRON (CVX)	1.74	1.90	1.99	1.63	1.34	1.09	1.62	0.98	1.03	1.12	0.95	0.84	0.73	0.94
EXXON MOBIL (XOM)	2.17	1.85	2.18	2.00	1.73	1.56	1.92	1.20	1.14	1.31	1.28	1.14	1.09	1.19
SHELL (RDS)	2.11	2.58	3.09	2.71	2.35	2.19	2.51	0.95	1.14	1.36	1.30	1.26	1.19	1.20

3.2.6 Asset management ratio analysis (continued)

First, by looking at the table above, one can notice that BP's net fixed asset turnover has dramatically high value with average of 2.79 over sector average of 2.10. In this case, however, high ratio of fixed asset turnover does not necessarily suggest that corporation has been running its business at peak efficiency. Therefore, it the object of close analysis.

Generally, having a high value in fixed asset turnover might imply on different reasons such as overinvestments in fixed assets, outsourcing work or selling off excess fixed assets. However, in case with BP Corporation the reason of such sudden increase in net fixed turnover value might serve the oil spill disaster in Mexico, the best known as "Macondo Case", which result in numerous environmental, legitimate and financial issues for a company. In consequence of such disaster, the company has been forced to dispose many of its assets in order to raise enough cash to deal with its issues, which one of them is clean up the region (Annual Report, 2012)

The second highest turnover ratio in table, study can say is attributed to Shell's Corporation with net fixed asset turnover average of 2.51 and total asset turnover average of 1.20. The highest point is especially observed for 2011 year with value of 3.09, which is also close to BP's value of 3.15 to that period. Upon wondering the reasons of such increase in turnover rate, it can be found out similar scenario as like as BP Corporation. According to annual report for the 2011 period, corporation's revenue has increased nearly to 28% percent in comparing to previous financial period, which is most likely let one to think of possible disposing of net fixed assets worth to $ 457 million dollars in different regions; Cameron, Nigeria, Norway and U.S.A. (Annual report 2011). Therefore, upon considering this fact, one cannot be sure of true reason and it only let us to think of two possible outcomes such as decline in production, diminishing margins or even negative impacts of global financial crisis.

As in regards to Exxon Mobil Corporation, table demonstrates overall values are less efficient compared to peer competitors and to the sector's benchmark, except to total asset turnover ratio average. The average value of net fixed asset turnover implies that every dollar investment Exxon spends on fixed asset would help to generate only $1.92 dollar of sales whereas sector suggest that dollar of investment at least should help to generate about $ 2.10 dollar of sales. However, by analyzing all six-year values, it can

also be noticed sudden high values attributed to 2011, which does not makes to wonder of progressive development in process. If one see the annual report for 2011, it can be found that most proceeds are associated with selling off subsidiaries, plants and equipment worth of $ 11.133 million dollars, which in some reasons might be diminishing refining, and decline in production. Hence, it can be inferred that such spring in net fixed asset turnover probably the results of numerous divesting activities.

Finally, in comparison with all above mentioned corporations' utility efficiencies, Chevron has shown the lowest ones with fixed asset turnover average of 1.62 and total asset turnover average of 0.94, indicating that corporations assets has been utilized with less efficiently compared not only to sector's performance but also among its peer competitors. Its values have been close to efficiency for over three-year period before they started to deteriorate in 2012, 2013 and 2014 year. However, there are many factors may be contributed to such decline. According to financial analysts, there has been sufficient decline in Chevron's revenues from 2011 to 2013 year. Where in 2012, it was 4.65% percent and in 2013, it has dropped to -5.4% percent due to rise in production costs and inflation. Moreover according to Chief Executive John Watson results for 2014 year were hurt by lower crude oil price, lower refining margins and expenses (Fortune, 2014).

3.2.7 Profitability ratios

Profitability ratios are set of ratios that deliver crucial information about a company's overall performance relative to its sales, equity and assets. In financial analysis, profitability ratios are the most common and frequently used ratios to obtain a relevant data relative to a company. The necessary data generally obtained from annual reports, which is provided on regular basis, where income statements provide information on its revenues and expenditures for a specific period. (Bob Vause, 2009). In measuring profit, it is important to note that profitability ratios often divided into two categories: margins and returns. Margins indicate the ability of a company to convert sales dollars into profit whereas returns provide a useful information on the overall efficiency of organization in generating returns for its shareholders. High ratio indications are desired because they communicate that a company is in well financial position in generating its life-blood profits.

Gross profit margin is a good measure of company's manufacturing, distribution efficiency and shows implies on how much profit it earns from its cost sold. That is, the percentage of revenue after accounting the cost of goods sold. Here, cost of sales relates to labor, raw materials and overheads concerned to production cycle. Generally, high ratio means that company gained reasonable profit and is able to control overhead costs, whereas low values would mean vice versa scenario. As long as sufficient level has been achieved, a company uses its profit for funding R&D and marketing, which is, in turn, crucial for future earnings. Sometimes, however, it happens to be prolonged decline for in which case would mean "red flag", pressure on sales and earnings. According to global practice the level of ratio values are prone to be stable, but sometimes it might fluctuate in which case analyst should look hard and consider for different possible factors such as possible accounting fraud on dissimilarities. However, fluctuations also might result in change of product line, which, in turn, affect price of the products (Vause, 2009).

Net profit margin. Another fundamental key metric in financial analysis is net profit margin that shows the percentage of revenues after accounting of all expenses; operating expense, interest, taxes. Just like, as previous metric, net profit margin analysis can only be credible if competitors in the same industry compared against each other.

Net profit margin, basically, defines how much dollars of after-tax profit an entity earns on per dollar of sales. For example, if a company generated 1 dollar of revenue and shows 5 percent of net profit margin it means it makes 50 cent of profit. Ratio is useful tool for managers in that, it helps to maintain the costs over operations. As from shareholders view, this metric serves as a gauge for assessing the performance of the company in regards to its competitors (Clauss, 2010).

Operating profit margin. As it goes deep into profitability analysis, next turn comes to ratio of operating profit margin, which is found to be an effective ratio in measuring efficiency upon the organizations' operating process. Operating profit margin ratio, basically, represents the percentage of revenue left over as long as the operating costs- labor costs, raw materials, amortization, depreciation, selling, administrative and general expenses- are paid off. Normally, operating profit margin value should be lower than gross profit margin ratio since it excludes all above-mentioned costs (Clauss, 2010).

Figure 9: Profit Margins

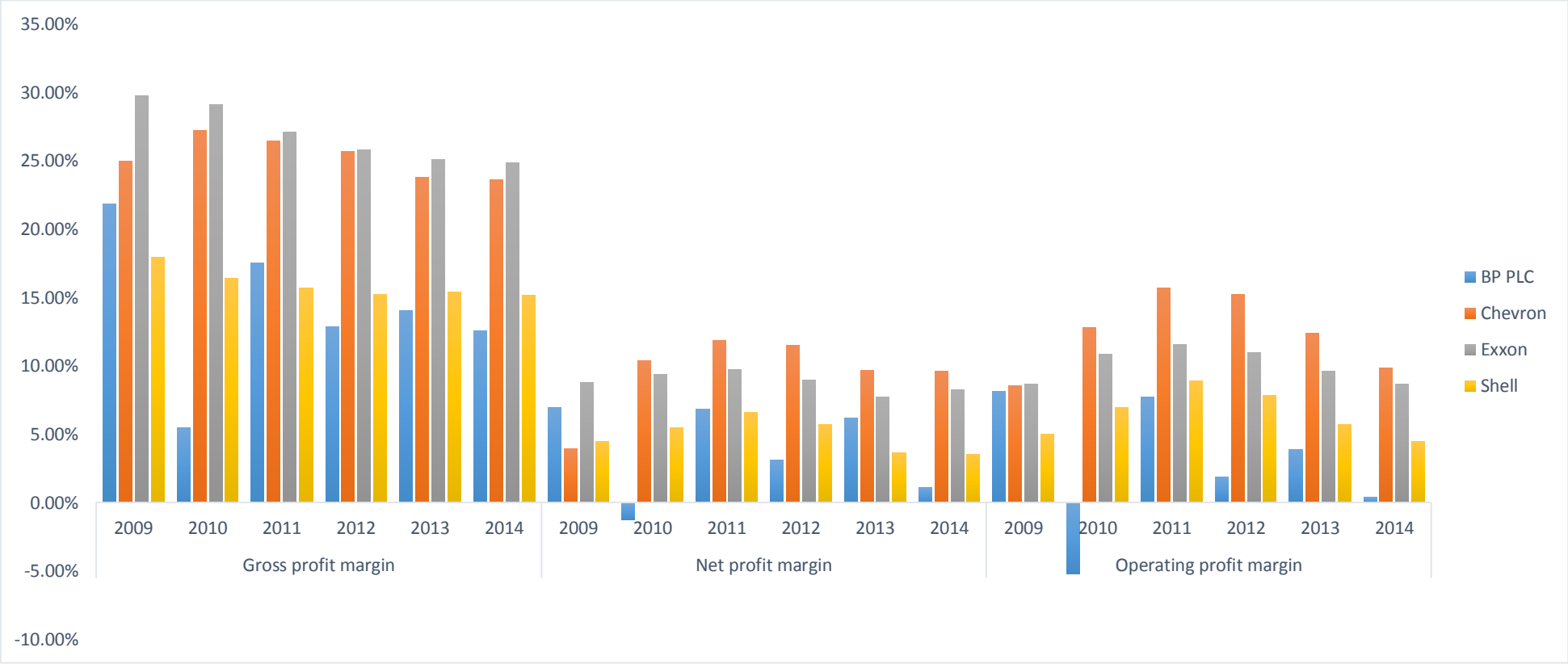


Table 8: Profit Margins: Competitive Benchmark Analysis

RATIOS	GROSS PROFIT MARGIN							NET PROFIT MARGIN							OPERATING PROFIT MARGIN						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
BP (PLC)	21.86%	5.48%	17.51%	12.89%	14.05%	12.53%	14.05%	6.93%	-1.25%	6.84%	3.08%	6.19%	1.07%	3.81%	8.17%	-5.22%	7.69%	1.87%	3.87%	0.37%	2.79%
CHEVRON (CVX)	24.96%	27.22%	26.48%	25.69%	23.77%	23.62%	25.29%	3.95%	10.35%	11.84%	11.47%	9.67%	9.60%	9.48%	8.56%	12.80%	15.67%	15.18%	12.36%	9.84%	12.40%
EXXON MOBIL (XOM)	29.76%	29.13%	27.13%	25.83%	25.08%	24.85%	26.96%	8.75%	9.36%	9.71%	8.96%	7.72%	8.25%	8.79%	8.70%	10.84%	11.58%	11.01%	9.58%	8.65%	10.06%
SHELL (RDS)	17.91%	16.42%	15.67%	15.23%	15.44%	15.15%	15.97%	4.50%	5.47%	6.58%	5.69%	3.63%	3.53%	4.90%	4.99%	6.93%	8.91%	7.84%	5.73%	4.47%	6.48%

3.2.8 Profitability ratio analysis

By looking at the table, it is clear that among the major oil and gas giants Exxon Mobil and Chevron has been showing the most impressive results relatively to other two peer corporations: BP and Shell. On average basis, Exxon has shown that in every sales dollar there is roughly 27, 10 and 9 cents of gross, operating and net income whereas for Chevron Corporation there is about 25, 12 and 9 cents of profit margins. As it seen in table of net profit and operating profit margins, it shows that both of the corporations had begun from challenging notes due to the first effect of financial crisis. According to CEO of Exxon Mobil Corporation, Rex Tillerson, the company had faced "difficult economic conditions" which is very highlighted by "lower refining and fuel margins and lower natural gas prices" (Market Watch, 2010). However, in spite of facing tremendous market uncertainties and declining trend in profit margins, both companies has been showing impressive performance over six-year period and, thus, showing commitment to growth in the future. According to "Global 500" today Exxon's expansion not only limited in U.S with construction of refinery in Texas but also followed by new projects in Singapore and Papua that took off in 2013 year (Global 500, 2014). Meanwhile, Chevron is also said to be the best performer in global oil and natural gas market. Notwithstanding, the revenue of $220 Billion of 2013, which 6% percent lower than 2012 year, according to CEO John Watson the company anticipates the production increase in 2015 as its continuing expansion in Australia and Gulf Mexico (Fortune, 2014).

Speaking of profitability margins of Shell and BP corporations, they turned up to be less profitable in relation to its above-mentioned competitors and therefore their profitability can be said "fair" rather than "excellent". On average base, Shell has reported 15.97, 6.48 and 4.90 cents of gross, operating and net income, which is well below its majors of Chevron and Exxon. Upon analyzing its revenues and gross profitability ratios, one can noticed that overall profit has deteriorated from 2011 to 2012 and then slightly improved from 2012 to 2013 year. Even though of slight improvements in profits, financial condition is still under question. Because according to reports borrowed from web resources, except for lower oil and gas prices, company has been exposed to several delays in production. That is, according to CEO Mr. Vosser, Shell's high-profile multibillion-dollar Alaska drilling program had encountered with some production problem due to damage of "Kulluk" vessel, which

led to suspend drillings in island until new vessel replaced (New York Times, 2013). Subsequently, at same time U.S government had blocked corporation from drilling activities before they provide more comprehensive plan for drilling that region. In addition to this delays it also worth to mention the recent fire in one of their pipelines in Nigeria, which also might serve as a factor in their performance. (Global 500, 2013). However, according to above mentioned results and news, the company cannot be inferred as in worst position. Instead, it should be anticipated as a winner for the next coming periods, because there is a sign for future growth. The reason is that, perhaps more than any other energy companies, Shell has been investing in huge oil and gas projects, which are being anticipated to be lucrative for the coming decades. One of the examples may be "Pearl GT"in Qatar, an enormous oil field of Emirates and where natural gas taken and converted into liquids like diesel (The New York Times, 2013). The other reason is might be recent new leadership and his views for future. According to recent report of CEO Ben Van Beurden, new chief executive officer, "the company's focus would be on improving on financial results achieving capital efficiency continuing to strengthen its operational performance and project delivery " (Fortune, 2014).

As concerning to BP Corporation, it has been showing dramatically negative trend compared with all above competitors. Above table reported, on average base, it owns only 14.05, 2.79 and 3.81 cents from every dollar of sales and negative profit value for 2010 year, which is the reason to think of repercussions of resent catastrophe, took place in Deepwater Horizon. Of course, one would decide that this was the straw that broke camel's back but along with that issue there are many other issues standing behind for its financial performance. According to analyst reports, between 1965 and 2010 company had been spending millions on issues such as "Helicopter" accident in North Sea, refinery explosion, corrosions on pipelines etc. Moreover, also worth to mention the price fluctuations over oil and gas skewed performance not only BP's but worldwide industry as well. Nevertheless, if one look from optimistic view, overall performance of Corporation also might be inferred from positive standpoint for future. Because of its recent report suggestions for opportunities about coming periods. Analyst believe that BP has still several opportunities associated with acquisition in the North Sea region reserves, production in Russia and investments in alternative energy (BP analysis, 2014).

Return on asset. Among the numerous financial tools used to measure profitability, return on asset (known as return on investment) is found to be more simplistic financial metric that both managers and investors used to define the ability of a company in generating profit with given set of resources. Ratio delivers a view on how effectively a company utilizes its assets (debt vs equity) and obtained by dividing net income, obtained from income statement, by total assets, which is stated on balance sheet. The high index of ROA is preferred as good sign of efficient level of management to which most investors are dependent in their financial decisions. According to management practice, some analyst tend to manipulate the general formula in order to improve managerial motivation and performance. An example would be using operating income instead of net income in that net income represents items that is non-controllable by management such as storm damage, loss, plant closing etc. (Subramnyam, 2013).

Return on equity. Just like as ROA, return on equity (ROE) draw information from different financial statements: income statements and balance sheets. ROE measures the rate of return firms earn on stockholders equity. The distinctive difference between ROA and ROE let to assumptions of liabilities. The reason is, that assets equal to liabilities plus shareholders' equity. Relying upon this assumption it is obvious if company holds no debt, the ROA and ROE would be equal. Suppose the other scenario, if firm holds debts, then the index of ROE would be high than that of ROA. Because shareholders' equity defined as assets liabilities. Thus, when equity decreases, the debt increases. Since ROE considers income against equity, it usually does not say about a company financing of weather from debt or bonds. For that reason, ROA and ROE compensate each other. If ROA indexes show positive result, according to industry level, then it is said to be the company has balance over debt levels. As to positive result of ROE, then it means that firm generates a good level of return to its stockholders (Subramnyam, 2013).

Figure 10: Profit Returns

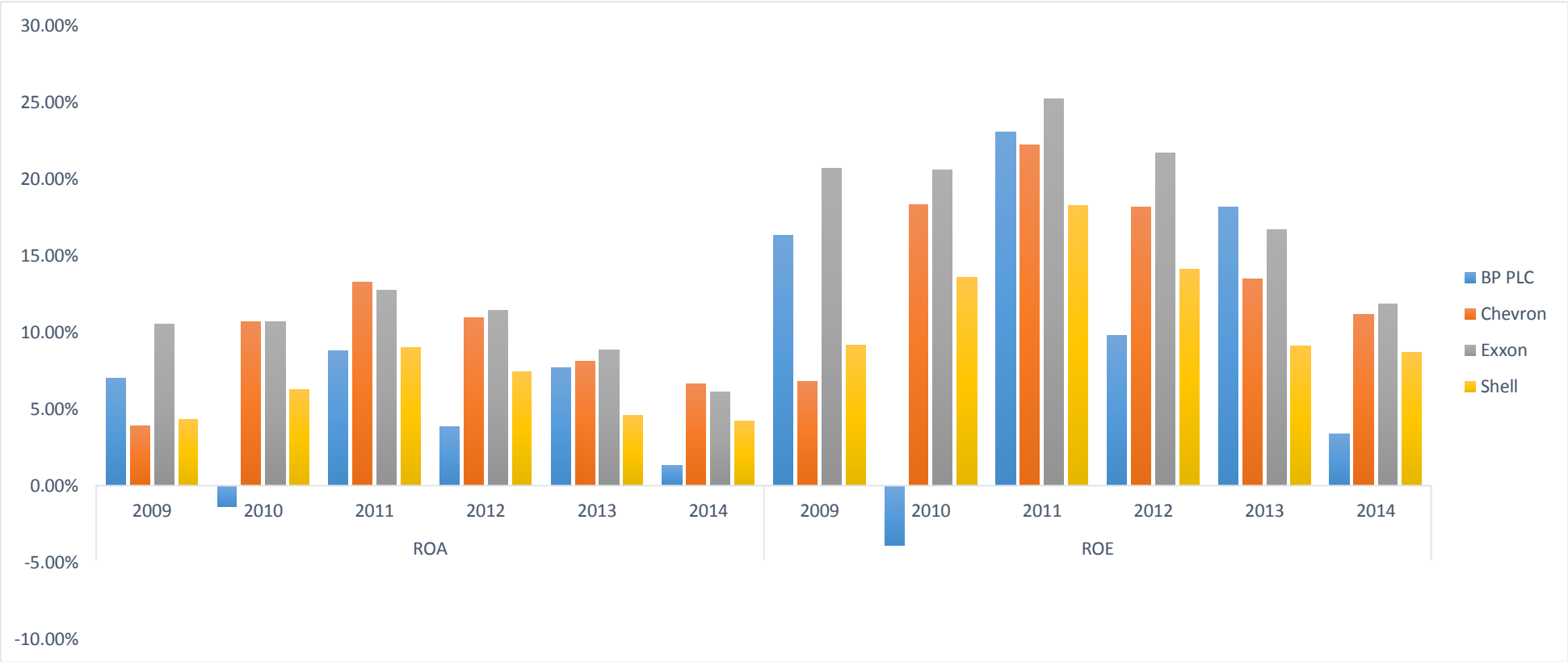


Table 9: Profit Returns: Competitive Benchmark Analysis

RATIOS	ROA							ROE						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
SECTOR BENCHMARK	5.91%	6.24%	10.29%	8.75%	7.45%	5.64%	7.38%	12.67%	13.71%	22.03%	17.90%	15.04%	11.63%	15.50%
BP (PLC)	7.03%	-1.37%	8.77%	3.86%	7.67%	1.33%	4.55%	16.31%	-3.92%	23.06%	9.78%	18.14%	3.39%	11.13%
CHEVRON (CVX)	3.88%	10.70%	13.25%	10.92%	8.09%	6.65%	8.92%	6.78%	18.30%	22.20%	18.14%	13.45%	11.17%	15.01%
EXXON MOBIL (XOM)	10.53%	10.70%	12.72%	11.43%	8.83%	6.09%	10.05%	20.66%	20.61%	25.20%	21.68%	16.64%	11.85%	19.44%
SHELL (RDS)	4.28%	6.24%	8.96%	7.38%	4.58%	4.21%	5.94%	9.18%	13.60%	18.24%	14.11%	9.09%	0.65%	10.81%

3.2.9 Profitability ratio analysis (continued)

Upon analyzing the above table, the healthiest ratios are attributed to Exxon Mobile Corporation. On average base, ROE reported 19.44 % percent of generating income for shareholders, which is also above the sector average of 15.50 percent. From chart above it is obvious that Exxon turned to be a winner over its closest rivals Chevron, Shell and BP. It also justifies previous assumptions on cumulative effect of given ratio and shows that Exxon Mobile results also consistent with its inventory turnover 18.17 receivables turnover 16.18 and leverage value of 0.11.

Similar results also observed for Chevron Corporation with slightly below average of ROE 15.01% percent against sector average of 15.50% percent and well above sector average ROA of 8.92% percent, showing wise investment decisions and asset management efficiency, which is also, puts Corporation above its peers like Shell and BP. The results also reflected upon its leverage and turnover ratios: 0.11 of debt-to-equity and 25.12 of inventory turnover.

However, in case with Shell's profitability ratios, it has been showing slow recovery development compared to Exxon and Chevron. For the six-year period its ROA and ROE has been well below the sector averages. Again, such results direct us to converge in some recently occurred events with suspended production in some geographic areas along with fluctuations over oil and gas prices. However, in consistency view of ROE and ROA, if we look once again to its debt-to-equity of 0.25 and debt-to-capital of 0.20 company has not in much worrisome position, which means for investors a company is less risky to make investments.

Lastly, in case with BP Corporation's profitability, table demonstrates not so impressive values. Even now by looking at both chart and table, the disastrous consequences for a company is obvious where levels of ROE and ROA are minus signed. However, upon considering ROE it might be misleading conclusion and might be inferred that company has a good level of return to its equity holders unless consider consistency of analysis with previous ones. Once analyzed BP's performance, study concluded that most of its operations relies upon heavy debt level, which is obvious even by looking to its debt-to-equity ratio of 0.41 doubling sector's benchmark of 0.23. The underlying reason is taking up much debt from U.S government to cover all repercussions of recent disaster.

3.3 Energy Ratios

Applying standard financial ratio analysis, of course, can be one of the advantage in assessing a company's performance. However, upon examining the limitations of financial statement analysis it is obvious that overall analysis will not say where exactly the problem exist and what should be done to evaluate it since all financial ratios covers only assumptions, looking from retrospective standpoint. Therefore, the following section have been encouraged to investigate further and find it useful to include not only the set of general financial tools but also the energy ratios, which are specific tools, organized solely to the energy industry. The energy ratios are group of ratios that help to assess a performance of upstream oil and gas companies and can be measured by using various sources of supplementary data of annual reports posted by E&P companies. Without applying them, current study's financial statement analysis would be incomplete.

3.3.1 Reserve ratios

Set of ratios that answers to the following questions

1. Given current production rate, how long company's reserve last?
2. What percentage of reserves is produced?
3. How much of reserves were replaced?

Reserve life index ratio. Most commonly known as reserve to production ratio, reserve life index is a ratio that measures approximate lifespan of reserves being produced by a company. The ratio is frequently calculated and served as a key metric used in oil and gas industry. It has a strategic significance not only for a company but also for a government because it helps to forecast the future resource availability, estimate future income, employment and estimates a project life. However when calculating ratio, for analyst, it is crucial to make assumptions on the future technology change in the industry since, as it known from previous section, the resource exploration is highly dependent on technologies. The ratio calculation is implemented through dividing amount of available resources (numerator) by the amount of resources produced (denominator) during the year. All necessary inputs for calculation Energy ratios 1 through 3 can be computed using 20-f or 10-k annual report where supplementary statement is noted as "Proved Reserve Disclosures for Oil and Gas Reserves" High ratio values are preferred but, however too high values might be an indication of a

problem in production. Therefore while computing and analyzing it is useful to make assumptions in a group of other related ratios

(Example of "Proved Reserve Disclosures for Oil and Gas Reserves given in Appendix "D").

Production replacement ratio, known as reserve replacement ratio, is one of the key metric in assessing the organizational performance of Oil and Gas Company. It measures the amount of resources added to a company's reserves relative to the amount of resources produced during a specific period. Since the industry is highly dependent on demands factor, while analyzing the ratio it is important to take into account the number of discoveries and estimations. Because they are generally, tend to fluctuate over time. High ratio is preferred since it indicate the future growth. As in case of lower ratio outcome, which is less than 100% that would mean decline in replacing the oil and gas reserves (Simkins, 2013).

Finding and development reserve replacement ratio. In addition to previous reserve metrics, finding and development reserve replacement ratio indicates the percentage of consumed reserves that replaced through Finding and Development. Key point in metric calculation is to find out of weather a company replacing its reserves through purchasing or through finding and development. Typically, for oil and gas company purchasing reserves turns to be very expensive than organic acquisition of reserves. Therefore, ratio is used to be very informative in assessing the operational efficiency of a company. It calculated as; sum of Extensions, Discoveries, Improved Recovery and Reserve Revisions divided by Production (Simkins, 2013).

Figure 11: Reserve Ratios

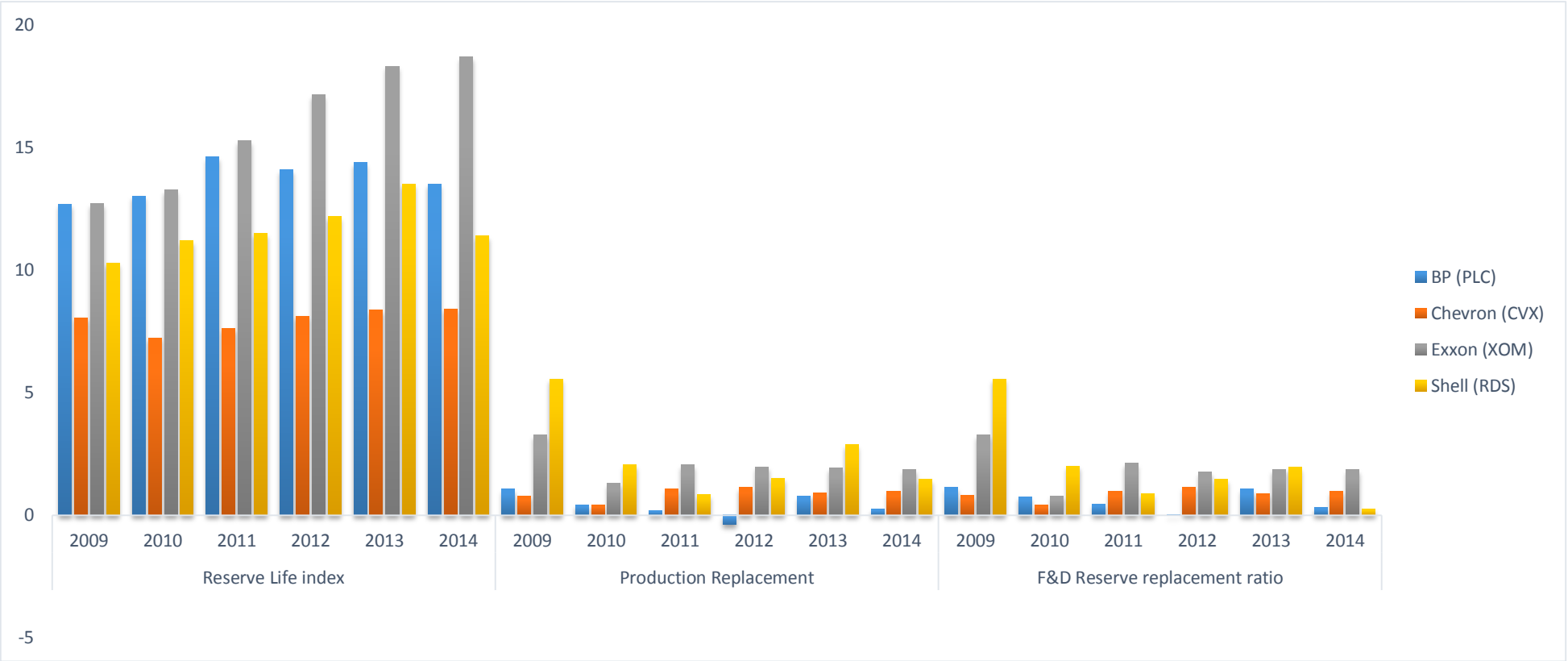


Table 10: Reserve Ratios: Competitive Benchmark Analysis

RATIOS	RESERVE LIFE INDEX							RESERVE REPLACEMENT							F&D RESERVE REPL.						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
BP (PLC)	12.7	13.0	14.6	14.1	14.4	13.5	13.7	105.9%	41.3%	16.6%	-37.9%	76.8%	23.4%	37.7%	112.0%	74.0%	44.6%	-2.4%	104.9%	28.9%	60.3%
CHEVRON (CVX)	8.0	7.2	7.6	8.1	8.4	8.4	8.0	78.2%	42.4%	104.4%	110.8%	90.3%	96.5%	87.1%	79.8%	40.7%	98.1%	113.3%	88.9%	96.9%	86.3%
EXXON MOBIL (XOM)	12.7	13.3	15.3	17.1	18.3	18.7	15.9	326.1%	128.6%	205.0%	196.2%	191.9%	186.1%	205.6%	326.5%	78.3%	210.4%	174.9%	186.5%	185.6%	193.7%
SHELL (RDS)	10.3	11.2	11.5	12.2	13.5	11.4	11.7	554.6%	205.0%	81.8%	150.2%	286.7%	145.0%	237.2%	554.8%	201.3%	89.4%	146.3%	194.3%	24.1%	201.7%

3.3.2 Reserve ratio analysis

Once having analyzed table, among the four oil majors the most outstanding values are attributed to Royal Dutch Shell Corporation. Even though, it's Reserve Life average of 11.7 year falls behind its competitors as Exxon Mobil and BP, the rest of its ratios has shown the best competitive advantage by highest ratios in Reserve Replacement of 237.2% percent. Thus, it gives a positive view about the company since it has moderate level of reserve life span, the highest replacement rate of reserves and outstanding capability in exploring reserves.

Similar the best results also can be observed from Exxon Mobil Corporation with the highest reserve life average of 15.9 years lasting. It also shows that a company has been able to sustain the best level of Reserve Replacement of 205.6% percent and well exploration activity over replacing its resources. Therefore, it can be assigned an "excellent" level for a company as well as like its peer Royal Dutch Shell Corporation.

When it comes to analysis of other two super majors, Chevron Corporation has been demonstrating very short life lasting of reserves and has only the average about 8 years over current production level, which is almost double less than that of Exxon Mobil Corporation. The same trend is also observed from its replacing and exploring reserve capabilities with averages less than 100% percent. However, the poor position here deserved BP Corporation with the lowest replacement of reserves rate of 37.7 % percent and with the lowest exploration capabilities of 60.3% percent. Company that not replacing its reserves eventually deplete its resources and end up with tombstone over its corporation. Typically, corporation replacing its reserves should have sustain at least 1.0 times its reserve replacement ratio, which is 100% percent minimum. Thus, despite its fair level of reserve life of 13.7 year, current operation of BP cannot be said as good company for investment. From abnormal low values of BP, it is again points on recent tragic event. It can be inferred that a BP is still slow recovering period since the April 2010 explosion in which period BP had to engage in major divestment program, where it sold off almost half of its upstream installations, pipelines and one third of its wells. However, apart from mentioned factors, there is also another issue may also be result in such abnormal low reserve ratios. The reason might be associated with stringent safety regulations, which may hamper corporation from drilling activities. (Williams, 2013).

3.3.3 Reserve cost ratios

Set of ratios that answers to the following questions

1. How much does it cost for company to find oil?
2. How much does it cost to replace reserves, either through drilling or buying reserves?
3. How much does it cost for company to produce its reserves?

Reserve replacement cost. A ratio that measures the average cost of one barrel of oil equivalent added to the company's proven reserves by means of acquisition and exploration. The ratio is calculated as; Total Capital Expenditures divided by Extensions and Discoveries, Revisions, Improved Recovery and Purchases of Proved Reserves. Typically, lower rate of expenditure is desired. However, as noted earlier, accounting method is very dependent while calculation. Because, reported costs may differ according two generally accepted methods- successful effort method vs full cost method. To calculate following two cost ratios, inputs are generally borrowed from two statements: Proved Reserve Disclosures for Oil and Gas Reserves" and "Costs Incurred in Oil and Gas Acquisition, Exploration, and Development".

(Example of "Costs Incurred in Oil and Gas Acquisition, Exploration, and Development" given in Appendix "E")

Finding cost ratio measure efficiency of a company in adding new reserves. Among the key measuring metrics of oil and gas companies, finding cost ratio is the most commonly quoted ratio, but the most difficult to determine. The difficult, actually, results from different factors. First, it is accounting methods applied by different companies. Second, there is timing difference between cost incurred and financial reporting. However, this study will calculate ratios in accordance with successful effort methods so that overall analysis should be credible (Simkins, 2013).

Lifting cost ratio is also one of the perfect performance indicator and measure to which extend a company controls its operating cost. That is, deals with costs with producing of oil and gas from reserves. Generally term as "Lifting cost" used interchangeably with "production cost". The ratio is calculated through dividing production cost (nominator) by annual production (denominator). The sources for calculations can be found from different statements: "Proved Reserve Disclosures for Oil and Gas Reserves" and "Result of Operations from Oil and Gas activities". The lower rate of

cost is preferred and implies on efficiency on production. However, while calculating the ratio there is also additional factor that analyst should be cautious. Since all ratio analysis assumed for combined oil and gas production, production of oil costs usually overweight the cost of producing natural gas. Therefore, while analyzing ratio analyst must consider a main production of a company. That is, weather its primary production focused on oil or gas. Because, generally company focused more on oil production, entails a greater production costs

(Example of "Result of Operations from Oil and Gas activities" given in Appendix "F").

Figure 12: Reserve Cost Ratios

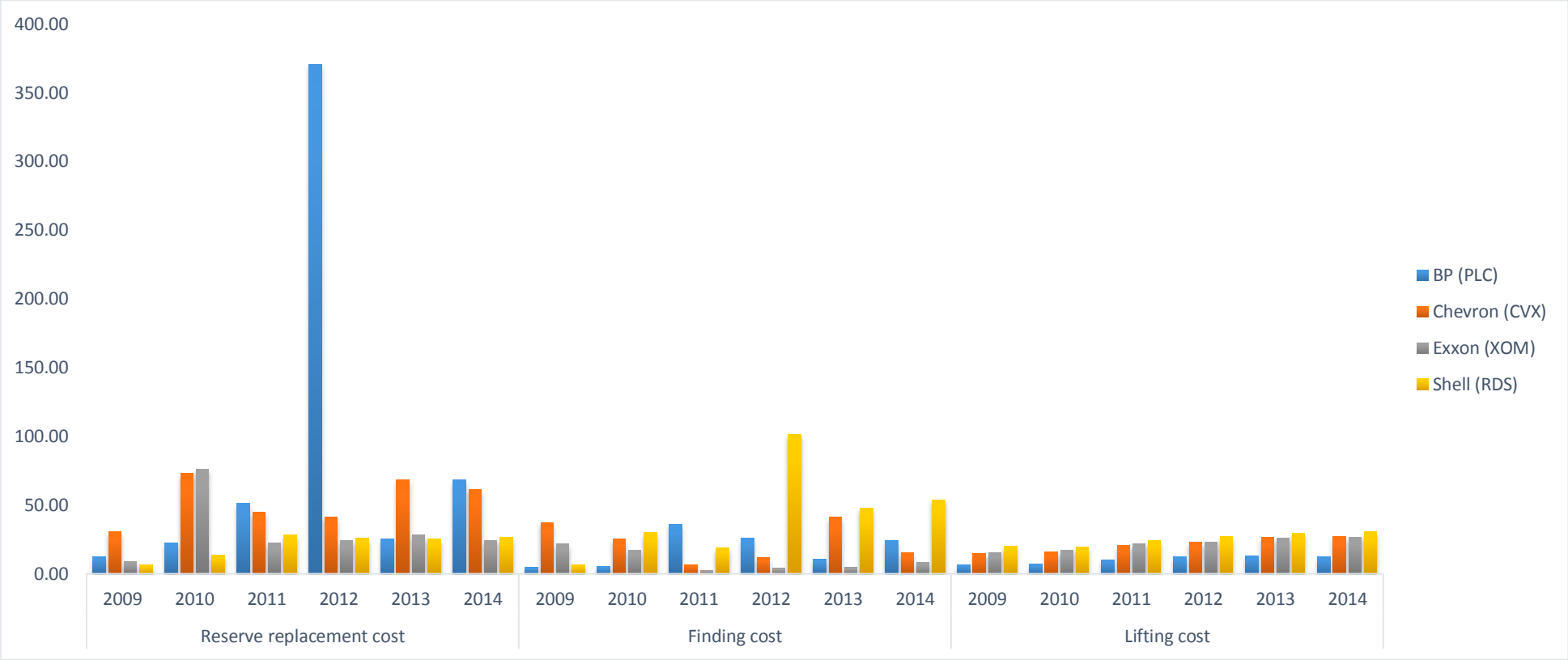


Table 11: Reserve Cost Ratios: Competitive Benchmark Analysis

RATIOS	RESERVE REPLACEMENT COST							FINDING COST							LIFTING COST						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
BP (PLC)	$ 12.25	$ 22.40	$ 50.79	$ 370.50	$ 25.17	$ 67.94	$ 91.51	$ 4.49	$ 5.34	$ 35.79	$ 25.78	$ 10.17	$23.67	$ 17.54	$ 6.29	$ 6.64	$ 9.86	$ 12.17	$ 12.72	$ 12.26	$ 9.99
CHEVRON (CVX)	$ 30.16	$ 72.82	$ 44.71	$ 40.75	$ 68.24	$ 61.19	$ 52.98	$ 37.00	$ 25.05	$ 6.39	$ 11.24	$ 40.85	$14.99	$ 22.59	$ 14.35	$ 15.56	$ 20.22	$ 23.03	$ 25.88	$ 26.95	$ 21.00
EXXON MOBIL (XOM)	$ 8.66	$ 75.90	$ 21.83	$ 23.74	$ 27.88	$ 23.79	$ 30.30	$ 21.52	$ 16.45	$ 2.17	$ 3.66	$ 4.42	$ 7.81	$ 9.34	$ 15.20	$ 17.08	$ 21.69	$ 22.49	$ 25.69	$ 26.00	$ 21.36
SHELL (RDS)	$ 5.91	$ 13.13	$ 28.05	$ 25.80	$ 25.04	$ 26.06	$ 20.66	$ 6.50	$ 29.73	$ 18.40	$ 100.99	$ 47.72	$53.45	$ 42.80	$ 19.99	$ 19.41	$ 23.91	$ 26.97	$ 29.52	$ 30.13	$ 24.99

3.3.4 Reserve cost ratio analysis

Analyzed the above table, it clearly demonstrated that among the best label of cost effective corporation stands for Exxon Mobile and British Petroleum Corporation. Upon considered first winner-Exxon, according to the table, its average of reserve replacement cost per BOE (barrel of oil equivalent) is $30.30 dollar, the second position after Royal Dutch Shell and well above the Chevron and BP. As to its finding and development cost per BOE, the company no doubt turn out to be a winner in this term with the healthiest ratio whose average is $ 9.34 dollar. However, when it comes to its production cost rate, known as lifting cost, the corporation has been demonstrating a moderate level of cost control over its extractions, with average of 20.43.

The second highest, however, with most dubious values among the peers is British Petroleum Corporation. It has shown the first position in efficient producing cost of $9.99 per BOE, second position in finding cost of $17.54 per BOE and fourth position in reserve replacement cost efficiency with average of 91.51 per BOE. Although prevailing of the highest values in producing and finding cost efficiency, it cannot safely be assured that a company in its peak efficiency in upstream operations. Because, as it's known from previous calculation results, the reserve replacement ratio attributed to a company was about 37.7 % percent. Consequently, this is the very reason of why a company has owned lowest replacement rate since it has not been spending enough on finding and development of reserves. Thus, according to reserve ratios and reserve cost ratios study can be confident that a company is in hard times of recovery and can only deserve the fourth position among its peer competitors.

In case of other two super majors, from analysis the second true and third positions are attributed to Chevron and Royal Dutch Shell Corporations. Here, in table Chevron replacement expenditures show far above cost level than that of Shells with average of $52.98 per BOE. Nevertheless, having higher cost in reserve replacement, the company turned up to be second after BP, with lowest cost in lifting cost of $ 21.00 per BOE and third in finding cost with average of $22.59 per BOE whereas Shell's results have dominated over only one position with the lowest cost in reserve replacement with average of $ 20.66 per BOE.

3.3.5 Reserve value ratios

Set of ratios that answers to the following questions

1. What is the value of reserve additions?
2. What value has been added?

Value of proved reserve additions measures a value of added reserves and calculated as sum of Changes due to Extensions, Discoveries, Improved Recovery, Changes due to Purchases divided by sum of Reserve Extensions and Discoveries, Improved recovery, Revisions and Purchases of Reserve in place. All items for calculating the ratio are gathered from two supplementary data statements; "Sources of Change in Discounted Future Net Cash Flow" and "Proved Reserve Disclosures for Oil and Gas Reserves". Since most used ratios only measures the quantities of reserve and do not convey the understanding on actual values of reserves, value of proved reserve addition ratio found to be widely used by investors and management. Because, in oil sector, values of reserves plays an important role in assessing a company.

(Example of "Sources of Change in Discounted Future Net Cash Flow" given in Appendix "G")

Value added ratio is a crucial component in evaluation of oil and gas companies since it conveys an information on values has been added to reserves. The foremost objective in calculation is to examine the relation of the cost of added reserves to the values of those reserves. The high ratio is preferred but not less than sub unitary value. Therefore, all manufacturing companies try to maximize their value added ratio. The calculation is simpler than previous ones. To calculate the value it is only required to divide "Value of Proved Reserves" by "Reserve Replacement Cost" (Simkins, 2013).

Figure 13: Value of Proved Reserve Additions

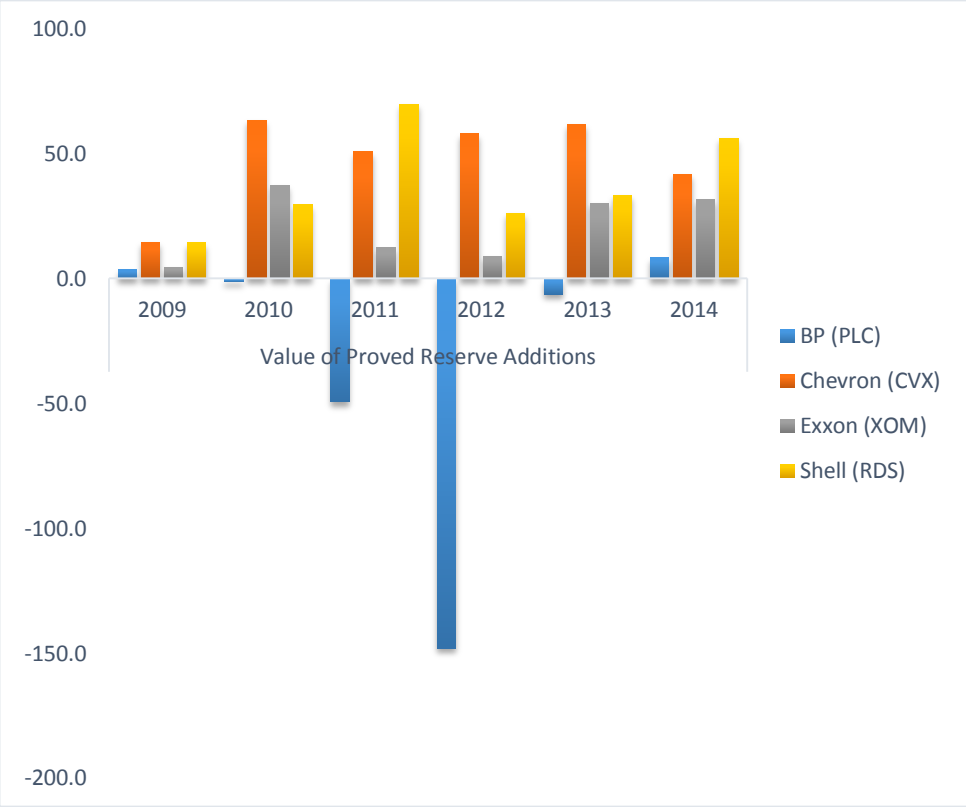


Figure 14: Value Added Ratio

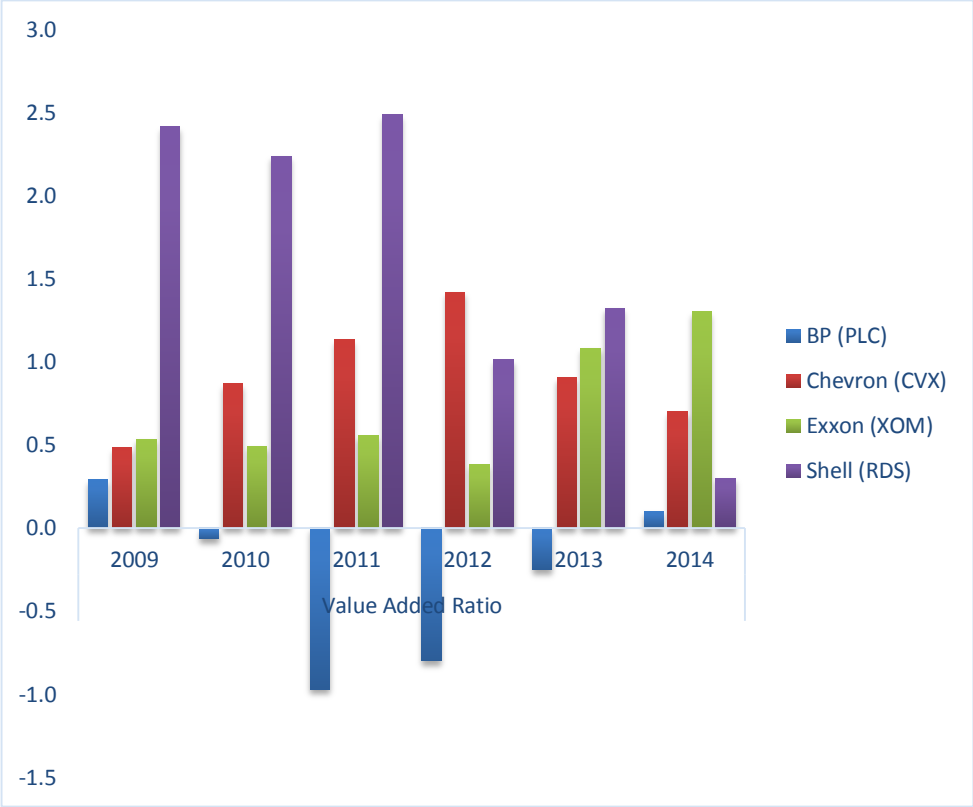


Table 12: Reserve Value Ratios: Competitve Benchamrk Analysis

RATIOS	VALUE OF PROVED RESERVE ADDITIONS							VALUE ADDED						
YEARS	2009	2010	2011	2012	2013	2014	AVERAGE	2009	2010	2011	2012	2013	2014	AVERAGE
BP (PLC)	3.6	-1.4	-49.3	-296.0	-6.3	8.5	-56.8	0.3	-0.1	-1.0	-0.8	-0.2	0.1	-0.3
CHEVRON (CVX)	14.6	63.2	50.8	57.8	61.7	41.8	48.3	0.5	0.9	1.1	1.4	0.9	0.7	0.9
EXXON MOBIL (XOM)	4.6	37.4	12.1	9.0	30.1	31.5	20.8	0.5	0.5	0.6	0.4	1.1	1.3	0.7
SHELL (RDS)	14.3	29.4	69.8	26.1	33.2	56.1	38.1	2.4	2.2	2.5	1.0	1.3	0.3	1.6

3.3.6 Reserve value ratio analysis

First, by looking at overall set of energy ratio, the first two best competitive companies are obvious. They are Royal Dutch Shell and Chevron Corporations. Because. Here, it suggests that over six-year period Shell has been able to achieve the maximum level of value added per BOE of 1.6 and quite a good level of value upon its reserves, slightly giving in to its competitor as Chevron with average of $38.1 per BOE. Hence, because of getting excellent performance in reserve ratio analysis and having moderate level in reserve cost ratio it can assigned as a company with an excellent performance.

Similar pattern in reserve value ratios can also be observed from Chevron Corporation with high above all average of $48.3 per BOE in its values of reserves and with minimum average of 0.9 in value added ratio, which is important to sustain with given global condition. Thus, having the first position in reserve value added ratio, the second positions in reserve cost, reserve value ratio and, finally, the third high position in reserve ratio analysis, it concluded that a company is the second competitive benchmark leader in the upstream level.

Concerning to Exxon Mobil Corporation, however, its reserves value in relation to cost not so comforting compared to Shell and Chevron competitors and has only average of 0.7, which is not consistent with the industry level. However, taking into account previously computed results, in some sense, it has been demonstrating far better competitive advantage over reserve and reserve cost ratios, where it has been able to take over Chevron, Shell, and BP corporations.

Finally, when it comes to BP Corporation's activity over its overall upstream operations, it leaves it much to be desired. Thus far, in all set of energy ratio analysis the company has been showing the lowest operation activity in exploring, replacing and production of its reserves, which performance shows disastrous consequences of recent event. However, apart from mentioned the most possible factor that affecting its overall performance, according to recent report's announcements, the future of the company might encourage investors because of optimistic view of company's activity. Reportedly, instead of acquiring reserves, which would be an expensive way for growth, the company has chosen a restructuring plan in enhancing a corporate health by focusing on new high quality projects in Mexico, Angola, Azerbaijan and North Sea (Dow Jones, 2013).

3.4 Data Envelopment Analysis (DEA)

As the main purpose of current study is to evaluate the performance of major oil and gas companies, from research view to analyze the overall efficiencies of studied companies are crucial, especially considering their relative efficiencies in combination of both financial and operational aspects. To analyze the performance is only possible with non-parametric method such as Data Envelopment Analysis (DEA).

Developed by Charles Cooper and Rhodes in 1978, Data Envelopment Analysis is increasingly popular and the most flexible method for evaluating the performance of a set of peer entities referred as Decision Making Units (DMU). The definition of DMUs may be individuals, branches of organization or entire organization. Since the development of DEA, it has become very popular with over 3000 publications by over 2000 authors and had been used in great variety of applications in evaluating the performances of many different kinds of entities involved in different activities (Tavares, 2002).

Thus far, DEA applications has been used DMUs of different forms to assess the performance of entities such as universities, hospitals, courts and others even by involving countries performance, regions etc. The basic and foremost reason of such widespread applications is that it requires very few assumptions and opened up possibilities for use in cases which have been resistant to other approaches because of complicated nature of relations between multiple inputs and outputs encompassed in DMUs (Cooper W, 2011).

As noted in literature by Cooper W (2011), DEA can also be used to provide new insights into activities, which had previously been assessed by other methods. Because thus far, it has been found that there are some evidences when studies of benchmarking practice with DEA had found numerous sources of inefficiencies in some of the most profitable entities that previously had been served as benchmarks from profitability criterion. Thus of such possibilities, current study found useful to apply this method in a view to gain more credible results in evaluating performance of major integrated oil and gas companies.

3.4.1 Basic principles

Data Envelopment Analysis represents mathematical method of linear programming classified as a non-parametric since there is no need for production function in determining the efficiency. It uses the inputs and outputs of Decision Making Units (DMU) in order to determine it input and output ratios. DMU's efficiencies determined by their place on the efficient frontier, which is a graphical representation of all DMUs with their respective inputs and outputs. The inputs and outputs determining the slope of the line joining the DMU to the point of origin. The highest slope formed by DMU considered as efficient frontier. Thus, all DMUs, which lies on this line, are noted as "efficient" and the ones, which lies below, are deemed "inefficient". The further a DMU is located from the efficient frontier the more efficient it becomes (Sale R, 2009).

In general, the term of "Envelopment" in the method comes due to the property of the efficient frontier to "envelope" all efficient and inefficient points. In other words, this technique can be explained by determining the weights for the inputs and outputs ratios. The principle is that inefficient DMU will have low weight of ratio than DMU with efficient one. Hence, this method utilizes the weighted sum of outputs to the weighted sum of the inputs to define the performance between DMUs. In DEA, the linear program used will have the weights as decision variables and they are determined in way such that it gives each DMU the highest efficiency score.

In DEA, the number of linear programs is actually defined by the number of DMU since each DMU is compared to other DMU in one formulation to examine how efficient it is compared to others. Depending on the objectives of research the linear program can be either input oriented or output oriented. The input oriented model has the objective function, which generates unitary value ("1") if DMU is efficient. Closer value more efficient DMU. On the other hand, output oriented model has opposite logic where the remotest value deemed as efficient (Cooper W, 2011).

In some sense, DEA can be compared with regression analysis since they has similar objectives. For instance, like efficient frontier regression analysis uses the regression line and gives "average" performance of DMU by defining efficiencies of above and below units. However, unlike statistical method characterized as central tendency approach, DEA methodology is directed to frontiers and compares each DMU in the group. Moreover, the most critical aspect of DEA is that it can determine the best DMU

which would serve as a benchmark for further improvements whereas regression analysis unable to exclude the efficient from inefficient DMU has unable to give suggestion for improvement. Thus, because of such perspectives DEA proved to be the best evaluation technique in researches and found to be adept of uncovering relationships that remain hidden from other methodologies (Narayanan S, 2009).

3.4.2 Advantages and Disadvantages of DEA

Just like as any research method, DEA has its own strength and weaknesses. Therefore, for analyst it is crucial to understand and keep in mind while conducting studies. According to Cooper they are shown as follows;

Advantages

- It has capability to accommodate a multiplicity of inputs and outputs
- It can be used with any input and outputs
- Capable to calculate the extend of efficiencies and inefficiencies of any DMU
- Can be used as benchmarking techniques
- It can serve as a tool for "what if" analysis to include and exclude certain inputs and outputs

Disadvantages

- The results are very sensitive to the selection of inputs and outputs
- Only relative efficiency can be computed, the absolute or maximal efficiency is not addressed
- It is difficult to make statistical hypothesis since it is non-parametric method
- Due to extensive linear program formulations, the analysis is quite complex relating to all DMU.

3.4.3 DEA Model Selection

According to theory, the application of right model in DEA is of great importance. Because analyzed companies should be evaluated according to homogeneous process, i.e. performing same operations with the same objectives and operating under similar market conditions. Hence, as of such requirements of analysis, following study uses the same DMU analyzed for 2009-2014 periods in accordance to DEA CRS model

Constant Return Scale model is the ratio of maximization of the ratio weighted multiple outputs to the weighted multiple inputs. Hence, in study, any oil & gas

company compared to other one should have value of "1", or positive weights attributed to the inputs and outputs. The formulation of model is shown as the following mathematical equations (1.1, 1.2). The efficiency values (θo) for a group of peer DMUs (j = 1 . . . n) are calculated for the selected outputs (Yrj, r = 1, . . . , s) and inputs (Xij, i = 1, . . . ,m).

(1.1)

$$\text{Maximize } \theta o = \frac{\sum_{r=1}^{s} u_r \, y_{r0}}{\sum_{i=1}^{m} v_i \, x_{i0}}$$

(1.2)

$$\text{Subject to } \frac{\sum_{r=1}^{s} u_r \, y_{rj}}{\sum_{r=1}^{m} v_i \, x_{ij}} \leq 1$$

$$ur, vi \geq 0 \; for \; all \; r \; and \; i.$$

In this equation, the weights for the outputs and inputs are "Ur" and "Vi" and "0" means a focal DMU (i.e. each company in turn, becomes a focal company as efficiency value is being computed). Here, it is important to note that inputs and outputs scores, as well as weights are assumed by formulations to be greater than zero. The weights "Ur" and "Vi" for each Decision Making Units are defined from the output and input data at all DMU in the peer group of data. Thus, the weights applied for each DMU are those, which maximize the focal DMUs efficiency value (Sale R, 2009).

3.4.4 Inputs and Outputs Determination

In any DEA, selection of inputs and outputs is a critical stage since these variables are foundation of efficiency evaluation. Because as it noted, this phase is found to be one of disadvantages of DEA since any inputs and outputs are sensitive which thereby may affect overall outcome of analysis. The basic reason comes from the fact that DEA is used to evaluate performance by directly examining input and output data and consequently result will depend on input and output selection. Hence, in this stage it is important to keep in mind the limitation and select simple and the most important inputs and outputs. The most crucial aspect of choice between inputs and outputs is considering additional problems, which arises from differences between DMUs, such as different accounting principles, countries, economic environment etc.

As in case of this study, oil and gas industry thus far has been known to have very peculiar business structure; different sized companies operating under opaque environment, ill-defined cost, highly dependent on technology and production defined by technology etc. Therefore, considering all these eccentricities, following study will try to employ DEA method with selecting less biased inputs and outputs. For the following quantitative study, it has been decided to select inputs “total employment”, “Production and Manufacturing Expenses” and for output “Net income before taxation”.

Figure 15: Efficiency values of DEA

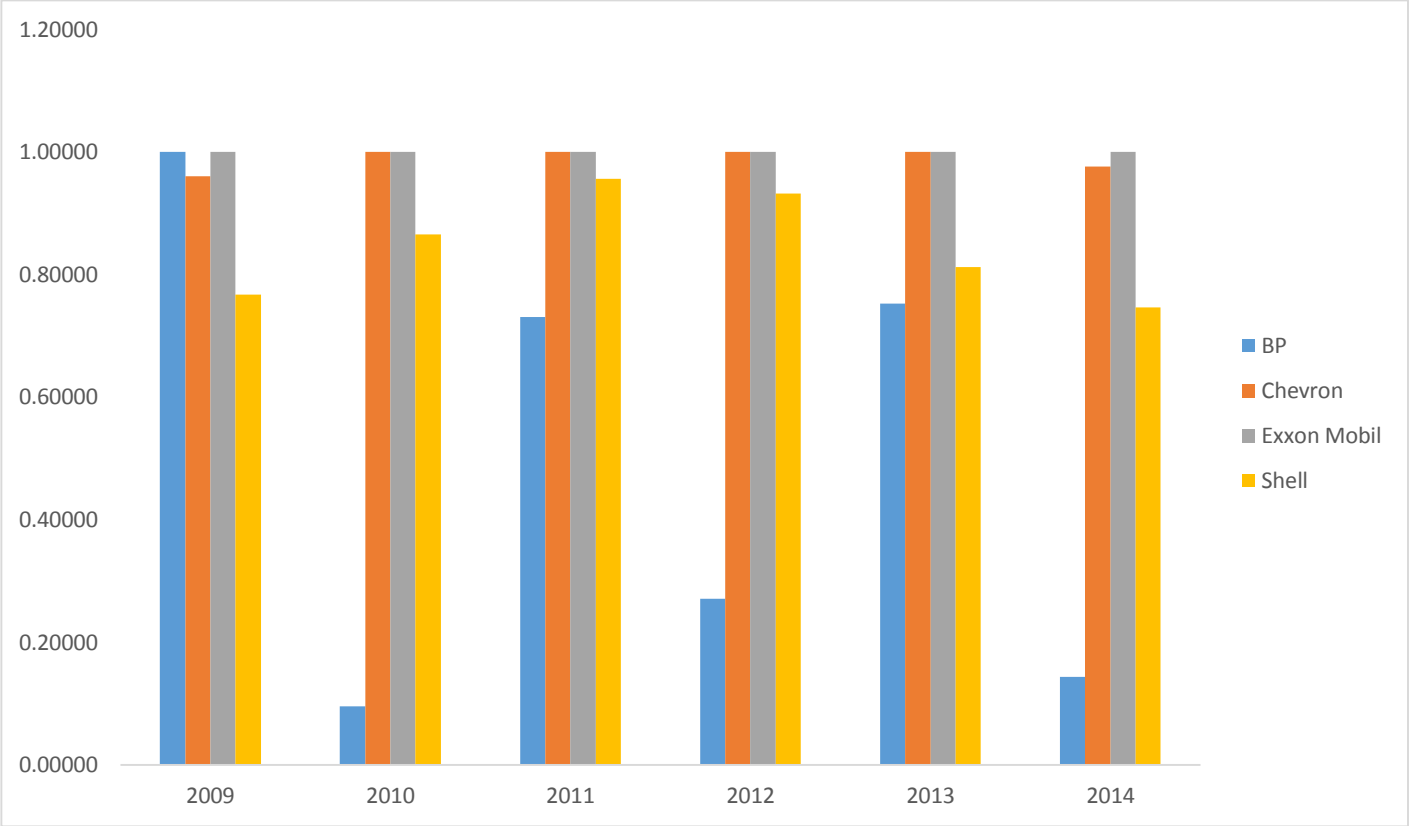


Table 13: Efficiency values of DEA: Competitive Benchmark Analysis

COMPANIES	2009	2010	2011	2012	2013	2014	AVERAGE
BP (PLC)	1.00000	0.09557	0.73098	0.27026	0.75302	0.14310	0.49882
Chevron (CVX)	0.96088	1.00000	1.00000	1.00000	1.00000	0.97657	0.98958
Exxon Mobil (XOM)	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Shell (RDS)	0.76724	0.86503	0.95611	0.93218	0.81169	0.74596	0.84637

3.4.5 Performance efficiency (DEA)

When the study came to analysis of relative efficiencies over major oil and gas companies, Data Envelopment Analysis has revealed thus far, very similar results as previous analysis - Financial and Energy ratio . Considering the best performance, out of four DMUs, analysis verified the first position for Exxon Mobil Corporation with sustained efficiency indexes of "1" in all given six-year period, hence, justifying the results of Financial and Energy ratio analysis.

Consequently, the second best efficient DMU stands out for Chevron Corporation with only lowest efficiency index of 0.96088 related to 2009 year which period coincides with the early stages of global financial crisis. According to International Energy Agency, this period was coupled with many project cancellations due to lower prices and cash flows, cutbacks in capital spending. It also stated that according to estimations compared to 2008, global upstream oil and gas investments budgets was hit by 21% percent and this resulted in 35 projects delays (IEA, 2009). In general perception, from analysis it concluded that American companies found to be the most outstanding ones relative to their European counterparts. This, however, may be due to lower dividend payouts compared to European companies, access to domestic low cost oil and, finally due to advantage of strengthening dollar that helps to international return (Zack Analyst Blog, 2015).

On the other hand, regarding to Shell's performance, analysis found it as the third competitive DMU, with slightly less than its peers' with average of 0.84637. However, upon examining its six-year efficiency, it has revealed the negative trend for the last 2014 year which period is associated with 4.6% percent plunge in sales and low production compared to previous periods (Fortune, 2014). Corporation has shown only the best efficiency index in 2011 year, which fact repeatedly indicate on its asset divestments worth $457 million dollar in strengthening financial performance.

As concerned to BP performance, it has shown relatively negative scope of efficiency and over six-year period, it has been able to achieve only average of 0.49882, which double less than its peer DMUs. Looking at the table, the most dramatically index has shown for 2010 period with efficiency rate of 0.09557 which, again justifies previous assumptions made in Financial analysis, "Macondo" case in 2010.

3.4.6 Summary

Table 14: Summary of Results

COMPANIES	RATIOS	RATE	PERFORMANCE
BP(PLC)	Liquidity	2nd	Good
BP(PLC)	Leverage	4rd	Poor
BP(PLC)	Asset management (Short-term activity)	2nd	Good
BP(PLC)	Asset management (Long-term activity)	1st	Excellent
BP(PLC)	Profitability	4rd	Poor
BP(PLC)	Reserve	4rd	Poor
BP(PLC)	Reserve Cost	4rd	Poor
BP(PLC)	Value Added	4rd	Poor
BP(PLC)	Performance efficiency	4rd	poor
CHEVRON (CVX)	Liquidity	1st	Excellent
CHEVRON (CVX)	Leverage	2nd	Good
CHEVRON (CVX)	Asset management (Short-term activity)	3rd	Fair
CHEVRON (CVX)	Asset management (Long-term activity)	4rd	Poor
CHEVRON (CVX)	Profitability	2nd	Good
CHEVRON (CVX)	Reserve	3rd	Fair
CHEVRON (CVX)	Reserve Cost	2nd	Good
CHEVRON (CVX)	Value Added	2nd	Good
CHEVRON (CVX)	Performance efficiency	2nd	Good
EXXON (XOM)	Liquidity	3rd	Fair
EXXON (XOM)	Leverage	1st	Excellent
EXXON (XOM)	Asset management (Short-term activity)	1st	Excellent
EXXON (XOM)	Asset management (Long-term activity)	3rd	Fair
EXXON (XOM)	Profitability	1st	Excellent
EXXON (XOM)	Reserve	2nd	Good
EXXON (XOM)	Reserve Cost	1st	Excellent
EXXON (XOM)	Value Added	3rd	Fair
EXXON (XOM)	Performance efficiency	1st	Excellent
SHELL (RDS)	Liquidity	4rd	Poor
SHELL (RDS)	Leverage	3rd	Fair
SHELL (RDS)	Asset management (Short-term activity)	4rd	Poor
SHELL (RDS)	Asset management (Long-term activity)	2nd	Good
SHELL (RDS)	Profitability	3rd	Fair
SHELL (RDS)	Reserve	1st	Excellent
SHELL (RDS)	Reserve Cost	3rd	Fair
SHELL (RDS)	Value Added	1st	Excellent
SHELL (RDS)	Performance efficiency	3rd	Fair

4. CONCLUSION

The central aim of this thesis was to assess the performance of oil and gas super majors in current economic volatile condition. The interest for such study came as a result of recent trends surrounded the industry, especially for the last six years. The purpose achieved through insightful analysis of given companies' financial and operational disclosures by relying on the best evaluation approaches such as Financial, Energy and Data Envelopment Analysis.

Based on study, study came up with decision that among the four analyzed companies, three of them has shown a satisfactory level of competitiveness. However, the most prominent one shown up to be an Exxon Mobil Corporation with the best ability to weather difficult economic condition. According to six-year ratios over its performance, the company has been demonstrating an effective utilization of its inventory and perfect balanced approach toward debt and equity with average of 0.11 that is quite outmatches the industry expectation of 0.23. With given global condition, where most of industries are heavy leveraged, such results, no doubt, places a company for prior position over its peers in that having the least reliance on debt financing entails the least risks and, therefore, attractive for investors. While keeping debt level at reasonable level, it also has shown an impressive return to capital and outstanding return to its equity holders with averages of 10.05% and 19.44% percent against the industry norms of 7.38% and 15.50% percent. As to its upstream operations, again it had shown the company set itself apart amongst the other IOC with significant oil reserve lasting of 15.3 year, with the best effective cost management, exploration and with excellent performance in replacing its resource bases. The combination of all of this, study believes it creates the best possible values for its shareholders. Moreover, upon analyzing its overall performance, Data Envelopment Analysis has revealed it as the most efficient company, which achieved 100% efficiency in all six-year period.

However, the relatively poor performance, study showed for BP Corporation. Throughout the study, results has demonstrated unsatisfactory and negative trends suggesting that a company is bursting at the seams in current economic condition. Among the numerous reasons for such performance, there is nothing certain but the disaster took place in Gulf Mexico. From all conducted analysis, it became obvious that explosion on BP's offshore drilling had disastrous effect than that of financial crisis. Because, it had result in company's acquiring of heavy debt from government

and even pressured it to divest almost half of its upstream installations, which are misleadingly, reflected upon its leverage and asset management ratios. Being as a main responsible entity for explosion, as of today, the company has been exposed to numerous restrictive regulations and the future of the company is ambiguous unless it recently acquired reserves in North Sea and its new investments start to bring sufficient level of profit in the future.

In overall picture of performance evaluation, it can be inferred that among the given case companies, American producers prevail far better competitive advantage than their European counterparts. Because from analytical reviews, among the possible reasons for such dominance is Exxon Mobil and Chevron's lower dividend payouts that ensures enough cash to cover investments and shareholders policies even in the most challenging times. The second reason is their access to low cost domestic oil reserves to which European companies are mostly constrained. Finally, the most important factor worth to mention is their advantage over strengthening dollar relative to other currencies that helps to companies to gain more returns on their international projects. Consequently, it may be inferred that, even though there are benefits to lower oil and strength U.S dollar, there might be also downsides. The question is how imports and exports will respond to such situation. Because if exports will falls, as a consequences of dollar dominance, the condition may also increase the level of competition among domestic companies.

Given the importance of the industry and its link between economic growths, form analysis, it has been inferred that recent global financial downturn had the most detrimental effect on oil and gas producers. Because due to slow economic growth followed by skewed demand on major energy commodity, it had put downward pressure on crude oil price. It has revealed that in consequences of low price, high production cost, major oil and gas producers had faced low energy investments thereby incurring diminishing profit margins. In response to such situation, many oil producers had to cut their capital spending and launch their divestment plan upon their upstream installations. In some sense, this recent global downturn can be classified as "manufacturing crisis" since condition had resulted in many project delays and cancellations.

In addition, it was concluded that the price risk in today's energy market is of great importance and has a profound impact on the long-term sustainability oil producing

companies because production has straightforward relation with the price of crude oil. As the industry is the single most important force in industry civilization, oil price instabilities are bound to have significant effect not only on producers but on overall economies as well. Because, thus far it has been justified by many studies of how countries are vulnerable to oil price shocks which mainly driven by security of supply. Considering today's global condition where demand for oil is likely to remain slow, mainly driven by economic growth, supply of oil most likely remain uncertain, not least considering persistent instabilities in producing countries and uncertainties concerning the finding new reserves. Consequently, because of such instabilities and in the context of today difficult financial condition, it can be safely concluded that future oil prices is expected to undergo to drastic fluctuations.

Form the study competitive environment analysis, according to Porter's industry framework, in general, oil and gas industry is characterized with high competitive environment delivering from the fact that most of all producing companies today are in the race of replacing their depleting reserves. The main problem comes from the fact that oil producing countries who represents suppliers of the basic ingredients for the industry, found to be practicing protectionist and restrictive policies toward international companies. It also found that big country consumers of oil might also exert bargaining power in the industry. Hence, upon analyzing overall trends, condition suggested a downturn in international oil producing companies' sustainable profitability except for national companies to whom picture is more favorable.

Hence, upon analyzing overall performances of given companies, it can be concluded that the overall the industry is subject of numerous risks that are highly correlative with current economic rate of development and sustainability of major IOC' is can be said in opacity. Because, taking into account of the future oil constrained possibilities, price instabilities, that mainly driven by current world's geopolitical arena, high production costs which increasing year over year and finally, concerns over finding reserves, place international oil producers into far more anxious condition.

4.1 Research Limitation

Generally, every academic report has its own limitations. In some sense it should be justified since not all information can be obtained and sometimes it requires an enormous time to which researcher is often limited. However, this current research had encountered with different types of limitations. They are as follows;

The first limitation in this study is finding the industry averages for analyzing profitability margins of related companies because oil and gas sector does not provides the industry averages for such set of profitability ratios. Therefore, to avoid such constraint, study make assumptions on six-year averages to make competitive benchmark analysis.

The second issue raised with calculation of energy ratios as Net Wells to Gross Wells and Recycle ratios which measure future profitability of oil and gas companies wells. The foremost reason of not computing them is that not prevailing sufficient theoretical and accounting background.

4.2 Suggestion for further research

Thus far, current research has been applying the best practices in financial, energy ratio analysis by combining non-parametric evaluation metric such as Data Envelopment Analysis. However, with given source of literatures and studies the industry analysis is still complex to analyze. Therefore, current research encourage further study also to combine statistical tools while evaluating the performance of oil and gas companies. That is, the most interesting part of the future research would be calculating the coefficient of standard deviation relative to sales, to measure to what extent a company is exposed to risk. It would give more insight on volatility of sales with current energy market condition. Moreover, as this study has taken only crisis period data, further research would be more fruitful if data would cover before and after recession period.

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APPENDICES

APPENDIX A

Income statement

	Note	2013	2012[a]	2011[a]
Sales and other operating revenues	7	**379,136**	375,765	375,713
Earnings from joint ventures – after interest and tax	17	**447**	260	767
Earnings from associates – after interest and tax	18	**2,742**	3,675	4,916
Interest and other income	8	**777**	1,677	688
Gains on sale of businesses and fixed assets	5	**13,115**	6,697	4,132
Total revenues and other income		**396,217**	388,074	386,216
Purchases	21	**298,351**	292,774	285,133
Production and manufacturing expenses[b]		**27,527**	33,926	24,163
Production and similar taxes	7	**7,047**	8,158	8,280
Depreciation, depletion and amortization	7	**13,510**	12,687	11,357
Impairment and losses on sale of businesses and fixed assets	5	**1,961**	6,275	2,058
Exploration expense	10	**3,441**	1,475	1,520
Distribution and administration expenses		**13,070**	13,357	13,958
Fair value gain on embedded derivatives	26	**(459)**	(347)	(68)
Profit before interest and taxation		**31,769**	19,769	39,815
Finance costs[b]	8	**1,068**	1,072	1,187
Net finance expense relating to pensions and other post-retirement benefits	30	**480**	566	400
Profit before taxation		**30,221**	18,131	38,228
Taxation[b]	11	**6,463**	6,880	12,619
Profit for the year		**23,758**	11,251	25,609
Attributable to				
BP shareholders	32	**23,451**	11,017	25,212
Non-controlling interests	32	**307**	234	397
		23,758	11,251	25,609
Earnings per share – cents				
Profit for the year attributable to BP shareholders				
Basic	13	**123.87**	57.89	133.35
Diluted	13	**123.12**	57.50	131.74

APPENDIX B

Balance sheet

$ million

	Note	31 December 2013	31 December 2012[a]	1 January 2012[a]
Non-current assets				
Property, plant and equipment	14	**133,690**	125,331	123,431
Goodwill	15	**12,181**	12,190	12,429
Intangible assets	16	**22,039**	24,632	21,653
Investments in joint ventures	17	**9,199**	8,614	8,303
Investments in associates	18	**16,636**	2,998	13,291
Other investments	20	**1,565**	2,704	2,635
Fixed assets		**195,310**	176,469	181,742
Loans		**763**	642	824
Trade and other receivables	22	**5,985**	5,961	5,738
Derivative financial instruments	26	**3,509**	4,294	5,038
Prepayments		**922**	830	739
Deferred tax assets	11	**985**	874	611
Defined benefit pension plan surpluses	30	**1,376**	12	17
		208,850	189,082	194,709
Current assets				
Loans		**216**	247	244
Inventories	21	**29,231**	28,203	26,073
Trade and other receivables	22	**39,831**	37,611	43,589
Derivative financial instruments	26	**2,675**	4,507	3,857
Prepayments		**1,388**	1,091	1,315
Current tax receivable		**512**	456	235
Other investments	20	**467**	319	288
Cash and cash equivalents	23	**22,520**	19,635	14,177
		96,840	92,069	89,778
Assets classified as held for sale	4	**–**	19,315	8,420
		96,840	111,384	98,198
Total assets		**305,690**	300,466	292,907
Current liabilities				
Trade and other payables	25	**47,159**	46,673	52,000
Derivative financial instruments	26	**2,322**	2,658	3,220
Accruals		**8,960**	6,875	6,016
Finance debt	27	**7,381**	10,033	9,039
Current tax payable		**1,945**	2,503	1,943
Provisions	29	**5,045**	7,587	11,238
		72,812	76,329	83,456
Liabilities directly associated with assets classified as held for sale	4	**–**	846	538
		72,812	77,175	83,994
Non-current liabilities				
Other payables	25	**4,756**	2,292	3,214
Derivative financial instruments	26	**2,225**	2,723	3,773
Accruals		**547**	491	400
Finance debt	27	**40,811**	38,767	35,169
Deferred tax liabilities	11	**17,439**	15,243	15,220
Provisions	29	**26,915**	30,396	26,462
Defined benefit pension plan and other post-retirement benefit plan deficits	30	**9,778**	13,627	12,090
		102,471	103,539	96,328
Total liabilities		**175,283**	180,714	180,322
Net assets		**130,407**	119,752	112,585
Equity				
BP shareholders' equity	32	**129,302**	118,546	111,568
Non-controlling interests	32	**1,105**	1,206	1,017
Total equity	32	**130,407**	119,752	112,585

APPENDIX C

Cash flow statement

$ million

	Note	2013	2012[a]	2011[a]
Operating activities				
Profit before taxation[b]		**30,221**	18,131	38,228
Adjustments to reconcile profit before taxation to net cash provided by operating activities				
Exploration expenditure written off	10	**2,710**	745	1,024
Depreciation, depletion and amortization	7	**13,510**	12,687	11,357
Impairment and (gain) loss on sale of businesses and fixed assets	5	**(11,154)**	(422)	(2,074)
Earnings from joint ventures and associates		**(3,189)**	(3,935)	(5,683)
Dividends received from joint ventures and associates		**1,391**	1,763	5,040
Interest receivable		**(314)**	(379)	(284)
Interest received		**173**	175	210
Finance costs	8	**1,068**	1,072	1,187
Interest paid		**(1,084)**	(1,166)	(1,125)
Net finance expense relating to pensions and other post-retirement benefits	30	**480**	566	400
Share-based payments		**297**	156	(88)
Net operating charge for pensions and other post-retirement benefits, less contributions and benefit payments for unfunded plans	30	**(920)**	(858)	(1,003)
Net charge for provisions, less payments		**1,061**	5,338	2,988
(Increase) decrease in inventories		**(1,193)**	(1,720)	(4,079)
(Increase) decrease in other current and non-current assets		**(2,718)**	2,933	(9,860)
Increase (decrease) in other current and non-current liabilities		**(2,932)**	(8,125)	(5,957)
Income taxes paid		**(6,307)**	(6,482)	(8,063)
Net cash provided by operating activities		**21,100**	20,479	22,218
Investing activities				
Capital expenditure		**(24,520)**	(23,222)	(17,978)
Acquisitions, net of cash acquired	3	**(67)**	(116)	(10,909)
Investment in joint ventures		**(451)**	(1,526)	(855)
Investment in associates		**(4,994)**	(54)	(55)
Proceeds from disposals of fixed assets	5	**18,115**	9,992	3,504
Proceeds from disposals of businesses, net of cash disposed[c]	5	**3,884**	1,606	(663)
Proceeds from loan repayments		**178**	245	203
Net cash used in investing activities		**(7,855)**	(13,075)	(26,753)
Financing activities				
Net issue (repurchase) of shares		**(5,358)**	122	74
Proceeds from long-term financing		**8,814**	11,087	11,600
Repayments of long-term financing		**(5,959)**	(7,177)	(9,102)
Net increase (decrease) in short-term debt		**(2,019)**	(666)	2,222
Net increase (decrease) in non-controlling interests		**32**	–	–
Dividends paid				
BP shareholders	12	**(5,441)**	(5,294)	(4,072)
Non-controlling interests		**(469)**	(82)	(245)
Net cash provided by (used in) financing activities		**(10,400)**	(2,010)	477
Currency translation differences relating to cash and cash equivalents		**40**	64	(493)
Increase (decrease) in cash and cash equivalents		**2,885**	5,458	(4,551)
Cash and cash equivalents at beginning of year		**19,635**	14,177	18,728
Cash and cash equivalents at end of year		**22,520**	19,635	14,177

APPENDIX D

Proved Reserve Disclosures for Oil and Gas Reserves

Developed	421	229	2,865	1	640	508	-	427	618	5,709
Undeveloped	546	103	1,504	195	1,110	587		209	445	4,699
	967	332	4,369	196	1,750	1,095	-	636	1,063	10,408
Changes attributable to										
Revisions of previous estimates	(89)	(27)	(342)	(5)	41	3	-	435	(36)	(20)
Improved recovery	20	-	161	-	25	7	-	81	-	294
Purchases of reserves-in-place	2	-	-	-	-	-	-	-	-	2
Discoveries and extensions	-	-	10	-	-	9	-	363	91	473
Production	(34)	(18)	(241)	(1)	(152)	(121)	-	(86)	(59)	(712)
Sales of reserves-in-place	(152)	-	(38)	-	-	-	-	(12)	-	(202)
	(253)	(45)	(450)	(6)	(86)	(102)	-	781	(4)	(165)
At 31 December 2013[f]										
Developed	280	225	2,525	2	564	486	-	582	735	5,399
Undeveloped	434	62	1,394	188	1,100	507	-	835	324	4,844
	714	287	3,919	190	1,664	993	-	1,417	1,059	10,243
Equity-accounted entities (BP shareja At 1 January 2013										
Developed	-	-	-	-	559	43	2,943	220	-	3,765
Undeveloped	-	-	-	-	508	39	2,265	15	-	2,827
	-	-	-	-	1,067	82	5,208	235	-	6,592
Changes attributable to										
Revisions of previous estimates	-	-	-	1	(20)	2	502	1	-	486
Improved recovery	-	-	-	-	38	-	-	1	-	39
Purchases of reserves-in-place	-	-	-	-	36	-	6,108	6	-	6,150
Discoveries and extensions	-	-	-	-	20	-	272	-	-	292
Production	-	-	-	-	(55)	(1)	(353)	(88)	-	(497)
Sales of reserves-in-place	-	-	-	-	(92)	-	(5,204)	(13)	-	(5,309)
	-	-	-	1	(73)	1	1,325	(93)	-	1,161
At 31 December 2013[h i]										
Developed	-	-	-	-	552	50	3,782	133	-	4,517
Undeveloped	-	-	-	1	442	33	2,751	9	-	3,236
	-	-	-	1	994	83	6,533	142	-	7,753
Total subsidiaries and equity-accounted entities (BP share)										
At 1 January 2013										
Developed	421	229	2,865	1	1,199	551	2,943	647	618	9,474
Undeveloped	546	103	1,504	195	1,618	626	2,265	224	445	7,526
	967	332	4,369	196	2,817	1,177	5,208	871	1,063	17,000
At 31 December 2013										
Developed	280	225	2,525	2	1,116	536	3,782	715	735	9,916
Undeveloped	434	62	1,394	189	1,542	540	2,751	844	324	8,080
	714	287	3,919	191	2,658	1,076	6,533	1,559	1,059	17,996

APPENDIX E

Costs Incurred in Oil and Gas Acquisition, Exploration, and Development

Acquisition of properties Proved	-	-	1	-	7				-	8
Unproved			158		284	30	-	7		479
	-	-	159	-	291	30	-	7	-	487
Exploration and appraisal costs	178	14	1,291	194	951	883	-	1,090	210	4,811
Development	1,942	455	4,877	569	683	2,755	-	2,082	189	13,552
Total costs	2,120	469	6,327	763	1,925	3,668	-	3,179	399	18,850

APPENDIX F

Costs Incurred in Oil and Gas Acquisition, Exploration, and Development

Sales and other operating revenues Third parties	1,129	183	934	5	2,413	3,195	-	1,005	1,784	10,648
Sales between businesses	1,661	1,280	14,047	12	1,154	6,518		11,432	941	37,045
	2,790	1,463	14,981	17	3,567	9,713	-	12,437	2,725	47,693
Exploration expenditure	280	17	437	28	1,477	387	-	768	47	3,441
Production costs	1,102	430	3,691	42	892	1,623	-	1,091	187	9,058
Production taxes	(35)	-	1,112	-	184	-	-	5,660	126	7,047
Other costs (income)[e]	(1,731)	86	3,241	55	322	89	65	84	351	2,562
Depreciation, depletion and amortization	504	490	3,268		559	3,132		2,174	207	10,334
Impairments and (gains) losses on sale of businesses and fixed assets	118	15	(80)		129	29		(16)	230	425
	238	1,038	11,669	125	3,563	5,260	65	9,761	1,148	32,867
Profit (loss) before taxation	2,552	425	3,312	(108)	4	4,453	(65)	2,676	1,577	14,826
Allocable taxes	554	475	1,204	(26)	642	1,925	(2)	682	641	6,095
Results of operations	1,998	(50)	2,108	(82)	(638)	2,528	(63)	1,994	936	8,731

APPENDIX G

Sources of Change in Discounted Future Net Cash Flow

Future cash inflows[a]	66,200	26,300	234,500	9,400	40,000	67,500	-	89,000	57,600	590,500
Future production cost[b]	21,900	11,200	99,000	4,600	11,600	17,800	-	35,000	20,000	221,100
Future development cost[b]	6,500	2,000	27,700	2,000	7,600	10,900	-	23,700	6,900	87,300
Future taxation[0]	23,900	8,000	37,000	400	11,100	14,300	-	6,200	8,100	109,000
Future net cash flows	13,900	5,100	70,800	2,400	9,700	24,500	-	24,100	22,600	173,100
10% annual discount[d]	6,800	2,200	34,300	1,900	4,200	9,300	-	13,300	12,800	84,800
Standardized measure of discounted future net cash flows[e]	7,100	2,900	36,500	500	5,500	15,200	-	10,800	9,800	88,300
Equity-accounted entities (BP share)[f] Future cash inflows[0]					45,800	- 255,600		14,300		315,700
Future production cost[b]	-	-	-	-	22,500	- 139,000		11,800	-	173,300
Future development cost[b]	-	-	-	-	6,000	- 19,700		2,100	-	27,800
Future taxation	-	-	-	-	5,900	- 15,200		100	-	21,200
Future net cash flows	-	-	-	-	11,400	- 81,700		300	-	93,400
10% annual discount[d]	-	-	-	-	6,900	- 48,700		100	-	55,700
Standardized measure of discounted future net cash flows[g h]	-	-	-	-	4,500	- 33,000		200	-	37,700
Total subsidiaries and equity-accounted entities Standardized measure of discounted future net cash flows	7,100	2,900	36,500	500	10,000	15,200	33,000	11,000	9,800	126,000

The following are the principal sources of change in the standardized measure of discounted future net cash flows:

$ million

	Subsidiaries	Equity-accounted entities (BP share)	Total subsidiaries and equity-accounted entities
Sales and transfers of oil and gas produced, net of production costs	(30,600)	(7,900)	(38,500)
Development costs for the current year as estimated in previous year	14,000	3,200	17,200
Extensions, discoveries and improved recovery, less related costs	1,900	2,000	3,900
Net changes in prices and production cost	(1,800)	(100)	(1,900)
Revisions of previous reserves estimates	(3,100)	(400)	(3,500)
Net change in taxation	12,900	3,400	16,300
Future development costs	(4,100)	(2,100)	(6,200)
Net change in purchase and sales of reserves-in-place	(3,500)	9,000	5,500
Addition of 10% annual discount	9,300	2,800	12,100
Total change in the standardized measure during the year	(5,000)	9,900	4,900