ÇANKAYA UNIVERSITY
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
ECONOMICS AND ADMINISTRATIVE SCIENCES

MASTER THESIS

SOME OBSERVATIONS REGARDING FINANCIAL REPORTING, FINANCIAL PERFORMANCE AND PORTFOLIO OPTIMIZATION OF MAJOR UPSTREAM IFRS PETROLEUM COMPANIES

Zaidon Adel Abood AL-DULAMY

AUGUST 2018

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Title of the Thesis: **Some Observations Regarding Financial Reporting, Financial Performance and Portfolio Optimization of Major Upstream IFRS Petroleum Companies**

Submitted by: **Zaidon Adel Abood AL-DULAMY**

Approval of the Graduate School of Social Sciences Master's in Business Administration-MBA, Çankaya University

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This is to certify that we have read this thesis and that in our opinion, it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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ABSTRACT

SOME OBSERVATIONS REGARDING FINANCIAL REPORTING, FINANCIAL PERFORMANCE AND PORTFOLIO OPTIMIZATION OF MAJOR UPSTREAM IFRS PETROLEUM COMPANIES

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M.B.A, Master of Business Administration
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This thesis focuses on some observations regarding upstream petroleum companies in terms of financial reporting, financial performance and portfolio optimization. The sample of this research is made up of upstream petroleum companies whose financial reporting is based on International Financial Reporting Standards (IFRS) within the framework of the sales revenue constraint. The findings of this research were collected using frequency distribution method, financial ratios and appropriate spreadsheet functions. From the perspective of financial reporting, findings show that (1) the majority of the major upstream petroleum companies prepare their financial statements in accordance with IFRS; (2) there is a diversification of accounting policy choices adopted by these companies regarding IAS 1, IAS 2, IAS 7, IAS 16, IAS 38, IAS 40 in the general context; and (3) this research indicates that major IFRS petroleum companies are inclined to report their exploration and evaluation expenditures using Successful Efforts method. From the perspective of the financial performance analysis, findings show that quoted IFRS petroleum companies are profitable and they generally improved their liquidity from 2014 to 2015 but they should be prudent in managing their short-term liabilities which may create pressure on the liquidity. From the perspective of portfolio optimization, this research

observed expected returns and risks of shares of major quoted IFRS petroleum companies by establishing different portfolio scenarios for the purpose of risk minimization and return maximization. Compared to the prior of research of Jurkowski & Daly (2015) which uses financial ratios and particularly profitability ratios for the purpose of investor's preference and risk tolerance, this research proposes that reasonable information that is required for investor's preference and risk tolerance is expected to be provided through financial ratios supported by different portfolio scenarios when investing into shares of petroleum companies.

Key Words: Financial Reporting, Financial Performance, Portfolio Optimization, IFRS, Petroleum Companies

ÖZ

UFRS'YE GÖRE RAPORLAMA YAPAN BÜYÜK BOY PETROL ÜRETİM ŞİRKETLERİNDE FİNANSAL RAPORLAMAYA, FİNANSAL PERFORMANSA VE PORTFÖY OPTİMİZASYONUNA İLİŞKİN BAZI GÖZLEMLER

Zaidon Adel Abood AL-DULAMY

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Bu tez, petrol üretim şirketlerinde finansal raporlamaya, finansal performansa ve portföy optimizasyonuna ilişkin bazı gözlemlere odaklanmıştır. Araştırmanın örneklemi, satış hasılatı kısıtı çerçevesinde raporlamasını Uluslararası Finansal Raporlama Standartlarına (UFRS) göre yapan büyük boy petrol üretim şirketlerinden oluşmaktadır. Araştırmanın bulguları, frekans dağılımları yöntemi, finansal oranlar ve uygun tablolama fonksiyonları kullanılarak elde edilmiştir. Finansal raporlama açısından, bulgular (1) büyük boy petrol üretim şirketlerinin büyük bölümünün finansal tablolarını UFRS uyarınca hazırladığını, (2) UMS 1, UMS 2, UMS 7, UMS 16, UMS 38, UMS 40 standartları açısından şirketler tarafından benimsenen seçimlik muhasebe politikalarında genel olarak bir çeşitlilik olduğunu ve (3) UFRS'ye göre raporlama yapan büyük boy petrol üretim şirketlerinin petrol araştırma ve değerlendirme harcamalarını Başarılı Sonuç yöntemine göre raporlamaya eğilimli olduğunu göstermektedir. Finansal performans analizi açısından, bulgular borsaya kote olup UFRS'ye göre raporlama yapan petrol şirketlerinin karlı olduğunu ve 2014 yılından 2015'e likiditelerinin genel olarak arttığını ancak likidite üzerinde baskı

yaratabilecek kısa vadeli borçları kontrol altında tutmaları konusunda ihtiyatlı olmaları gerektiğini göstermektedir. Portföy optimizasyonu açısından, bu araştırma büyük boy borsaya kote ve UFRS'ye göre raporlama yapan petrol şirketlerinin hisselerinin beklenen getirileri ve risklerini asgari risk ve azami getiri amacıyla farklı portföy senaryoları oluşturarak gözlemlemiştir. Yatırımcının tercihi ve risk toleransı amacıyla finansal oranları ve özellikle karlılık oranlarını kullanan Jurkowski & Daly (2015)'e ait önceki çalışma ile karşılaştırıldığında, bu araştırma petrol şirketlerinin hisselerine yapılacak yatırım açısından yatırımcının tercihi ve risk toleransı için gerekli makul bilginin finansal oranların farklı portföy senaryoları ile desteklenmesi ile sağlanabileceğini önermektedir.

Anahtar Kelimeler: Finansal Raporlama, Finansal Performans, Portföy Optimizasyonu, UFRS, Petrol Şirketleri

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DEDICATION

This thesis is dedicated to my beloved entire family and all my teachers that I have never forgotten them for their efforts, support, and encouragement along my studying years.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ART	Accounts Receivable Turnover
APT	Accounts Payable Turnover
BRIC	Brazil, Russia, India and China
EPS	Earnings Per Share
FCM	Full Cost Method
FIFO	First-in First Out
GAAP	Generally Accepted Accounting Practices
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standards
MOH	Motor Oil Hellas
NL	Netherlands
PPE	Property, Plant and Equipment
ROA	Return on Assets
ROE	Return on Equity
ROC	Return on Capital
SEM	Successful Efforts Method
UK	United Kingdom
US	United States
WA	Weighted Average

CHAPTER 1

INTRODUCTION

Oil industry is one of the largest industries in the global context. It covers the global exploration, extraction, refining, transport and marketing of petroleum products (Hazarika 2015; Kumar Bhaskaran and Sukumaran 2016). It is known that oil based products consist of fuel oil, gasoline and petroleum oil that is used in the manufacturing of many chemical products such as pharmaceuticals, pesticides and plastics.

According to the paper of Kumar Bhaskaran and Sukumaran (2016), there are three major segment of the oil industry: (1) upstream operations; (2) midstream operations; and (3) downstream operations. In this context, upstream operations refer to the exploration and production activities which include (a) searching for, (b) recovering and (c) producing crude oil from underground or underwater fields versus midstream operations refer to (a) shipping and (b) storage of oil which includes taking the crude oil supplied from the upstream sector and transferring it to the downstream processing facilities. As a final stage of operations, downstream operations cover (a) processing the materials collected during the upstream stage into a finished product and (b) actual sale of the products such as gasoline diesel oil, pesticides, heating oil and asphalt to other businesses, private individual or governments.

As stated in the paper of Kumar Bhaskaran and Sukumaran (2016), production constitutes an integral part of the petroleum industry due to the fact that primary assets of oil companies are based on oil reserves which refer to hydrocarbons that are located below the surface and that have not yet been produced and are economically viable to extract. It should be noted oil reserves refer to depleting assets and they require to be replaced through drilling and acquisition. If a petroleum company has proved reserves, it means that these reserves have an estimated quantity of oil that is expected to be economically viable and producible.

Due to the global presence of this industry as well as since exploration and production consist of an integral part of oil industry; this thesis refers to the analysis of major upstream petroleum companies in the global context from the perspectives of financial reporting, financial performance, and portfolio optimization.

Within the framework of this brief introduction, this introductory chapter is made up of four subsections as follows: (1) Objectives of the Thesis; (2) Significance of the Thesis; (3) Limitations of the Thesis; and (4) Assumptions of the Thesis.

1.1. Objectives of the Thesis

There are mainly four objectives of this thesis: (1) It examines financial reporting practices of major upstream petroleum companies to observe whether these companies are in common denominator regarding their adopted GAAPs; (2) it takes the picture of financial statements and disclosures of major upstream IFRS petroleum companies in terms of their adopted accounting policy choices to observe whether these companies are in common denominator regarding their adoption of IFRS accounting policy choices, (3) it analyses financial performance of major upstream quoted IFRS petroleum companies within the framework of their liquidity, solvency, efficiency, and profitability, and (4) it develops different portfolio scenarios by investing into shares of these companies to improve the prior literature.

1.2. Significance of the Thesis

This thesis is important because it provides insights about the financial reporting, financial performance and portfolio optimization of the major upstream IFRS petroleum companies.

1.3. Limitations of the Thesis

The sample is based on major upstream petroleum companies within the framework of the sales revenue constraint. In addition, data collected regarding financial reporting, financial performance and portfolio optimization belongs to the year 2015 only. Therefore, this research is limited to a point in time and indicative of accounting policies, financial performance and portfolio optimization for the time the sample is selected.

1.4. Assumptions of the Thesis

The following assumptions have been made regarding this thesis:

(1) For the purpose of financial reporting and financial performance, audited IFRS financial statements and notes were used to gather data. Therefore, it is assumed that reliable financial information was provided by audited financial statements.

(2) For the purpose of portfolio optimization, data was collected from the websites of these companies and from respected financial websites such as Yahoo Finance. Thus, it is assumed that reliable share price information was provided by those websites.

CHAPTER 2

LITERATURE REVIEW

This chapter is divided into two subsections regarding the literature review: (1) Literature Review on Financial Reporting, and (2) Literature Review on Financial Performance and Portfolio Optimization.

2.1. Financial Reporting Environment in the Country and Sector-Specific Context

Financial reporting is based on accounting policies that are the specific principles, rules and procedures implemented by a company's management team and are used to prepare its financial statements (Akdoğan & Öztürk 2015, 61). In each country, accounting policies are based on GAAPs depending on the regulation adopted by each country in the sense of local GAAP or IFRS.

It is known that IFRS adoption has became important in order to provide transparency, understandability, and comparability of the financial statements and the disclosures since 2005. That is why; many global and major companies and unavoidably listed ones have started to adopt IFRS in the global context. However, even if this is the case, there are still some companies that have not yet adopted IFRS and are stick to their local GAAP despite their global or major position. That is why diversification of GAAP still exists in the sector-specific context and this situation will be questioned from the perspective of petroleum companies in this research.

In addition, it should be noted that each single IFRS adopted entity should select and apply similar accounting policies for similar transactions, events and

conditions (Bahadır & Tolga, 389). However, if an IFRS specifically requires or permits diversification of items for which different policies may be appropriate, that specific IFRS offers accounting policy choices.

In terms of IFRS accounting policy choices, there are many research papers particularly prepared after the IFRS adoption in the country-specific and sector-specific context.

In the country-specific context, it is possible to see many papers observing the trends of IFRS accounting policy choices from the perspective of different IFRS adopted countries. For instance, Kvaal & Nobes (2010) examined German, French, British, Spanish, and Australian listed companies to observe the trends of 16 IFRS accounting policy choices (IAS 1, IAS 2, IAS 7, IAS 16, IAS 31, IAS 39, IAS 40) and they repeated this research in Kvaal & Nobes (2012). Furthermore, Nobes (2011) regarding Italian, Swedish, Dutch and Nobes (2013) regarding Canadian listed companies examined the trends of 14 IFRS accounting policy choices (IAS 1, IAS 2, IAS 7, IAS 16, IAS 31, IAS 39, IAS 40).

In addition, the paper of Bahadır & Tolga (2013) in terms of 11 accounting policy choices (IAS 1, IAS 2, IAS 7, IAS 16, IAS 38, IAS 40), and Akdoğan & Öztürk (2015) in terms of 14 accounting policy choices (IAS 1, IAS 2, IAS 16, IAS 31, IAS 38, IAS 40) examined the trends of IFRS accounting policy choices from the perspective of Turkish listed companies.

Within the framework these papers of Kvaal & Nobes (2010), Kvaal & Nobes (2012), Nobes (2011), Nobes (2013), Bahadır & Tolga (2013) and Akdoğan & Öztürk (2015), findings show that there is an influence of local GAAP over the IFRS accounting policy choices if IFRS permits an accounting policy that is available in local GAAP and this creates a diversification in financial reporting at different levels among countries. This diversification will be questioned in this research from the perspective of petroleum companies.

On the other hand, there are also some papers which determine the trends of accounting policy choices in the sector-specific context. These papers refer to

accounting policy choices in non-IFRS or IFRS context. For instance, Jaafar & Mcleay (2007) examined country and sector effects on the harmonization of accounting policy choice regarding inventory costing and depreciation methods prior to the IFRS adoption in Europe (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom), by assuming that accounting is harmonized when "all firms operating in similar circumstances adopt the same accounting treatment for similar transactions regardless of their domicile". This research indicates that country of domicile and sector of operations are significant determinants in accounting policy choice in the European context but particular determinant is country of domicile which deteriorates accounting harmonization according to Jaafar & Mcleay (2007). In line with Jaafar & Mcleay (2007), Stadler & Nobes (2014) verify that country factors have an important place over the IFRS accounting policy choices.

Furthermore, Mueller et al. (2008) examined the companies of European real estate sector in terms of the IFRS accounting policy choice offered by IAS 40 (cost model or fair value model) and determined that firms are more likely to choose the fair value model when the firm's pre-IFRS local accounting standards permitted or required fair values on the balance sheet.

On the other hand, it should be noted that accounting policy choice regarding the extractive industry is also diversified in the global context but this diversification has not yet regulated by IFRS 6 (Karapınar et al. 2012). From the IFRS perspective, since there is no regulation on the accounting policy choice regarding extractive industry, IAS 8 states that it allows extractive companies to continue applying the accounting policy in use prior to the issue of a new regulatory IFRS 6 (Power et al. 2017). In this case, there are two possibilities: (1) either preference will be given to local accounting policy or (2) preference will be given to a specific accounting policy choice for the purpose of generating comparative and consistent financial information regarding extractive industry and more specifically regarding petroleum industry in the IFRS context.

In this context, it should be stated that there are three different cost methods that are used to report costs related to monitoring, acquisition, exploration, development, construction, production and rehabilitation of extractive products: (1) Full Costing Method, (2) Successful Efforts Method, and (3) Area of Interest Method (IASC 2000; Karapınar et al. 2012) but the most frequently preferred methods are FCM and SEM (Noel et al. 2010; Abdo 2016; Power at al. 2017; Boz 2018, 40). SEM is used by most large petroleum companies but FCM is used by many mid-size to small petroleum companies (IASC 2000). While only costs that led to the successful discovery of oil can be capitalized under the SEM, all costs generated by exploration activity could be capitalized under the FCM (Noel et al. 2010). In terms of full costing method, it should be emphasized that the costs of unsuccessful exploration are also included in the amount of capitalization, creating an enhancement effect on earnings. Generally speaking, if net income generated by two methods is compared, it is known that net income under the SEM is less than under the FCM (Noel et al. 2010).

Table 2.1: Summary of Cost Methods

Type of Cost	FCM	SEM	Area of Interest
Reacquisition prospecting and exploration	Capitalise	Generally expense	Capitalise or expense
Property acquisition	Capitalise	Capitalise	Capitalise
Post-acquisition exploration	Capitalise	Capitalise or expense	Capitalise or expense
Evaluation or appraisal	Capitalise	Capitalise or expense	Capitalise or expense
Development	Capitalise	Capitalise	Capitalise
Construction	Capitalise	Capitalise	Capitalise

Source: (Karapınar et al. 2012)

Regarding the accounting policy choices on extractive industry, in the accounting literature, there are essentially three research papers that examine these accounting policy choices in recognizing the costs generated in extractive industry as the following Karapınar et al. (2012), Abdo (2016) and Power at al. (2017). These papers established different samples to analyze the trend of accounting

policy choices of the oil and gas companies in recognizing the costs generated in extractive industry in the IFRS context. For instance, (1) Karapınar et al. (2012) established a sample of extractive companies from Turkey, (2) Abdo (2016) prepared a sample of 122 upstream oil and gas companies from around the world and Power et al. (2017) created a sample of extractive companies from London Stock Exchange.

Within the framework of these papers (Jaafar & Mcleay 2007; Mueller et al. 2008; Noel et al. 2010; Karapınar et al. 2012; Abdo 2016; Power at al. 2017; and Stadler & Nobes 2014), diversification of IFRS accounting policy choices still exists in the sector-specific context and this situation will be questioned from the perspective of petroleum companies in this research.

In the general context of Jaafar & Mcleay (2007) and Stadler & Nobes (2014), it is possible to see that local accounting policies have an influence over the accounting policies adopted in the sector-specific context. That is why it looks like that if this situation keeps going on, accounting harmonization in the sector-specific context may not be possible.

By taking the prior research mentioned above, **chapter 4** of this thesis will contribute to the financial reporting literature in the following issues: (1) determination of the trend of GAAP in terms of the major upstream petroleum companies; and (2) determination of the accounting policy choices in the context of the major upstream IFRS petroleum companies.

2.2. Financial Performance Analysis and Portfolio Optimization for Petroleum Companies

Financial performance analysis refers to evaluating a company's financial strengths and weaknesses by taking its accounting and other financial data into account. Regarding the measurement of financial performance of petroleum companies, two recent research papers were determined to establish the basis to take the financial picture of petroleum companies.

The paper of Jurkowski & Daly (2015) examines the financial condition and stability of seven oil companies in the BRIC group of countries regarding their leverage ratios, liquidity ratios, profitability/efficiency ratios, and market value ratios. In this context, the following ratios were used to investigate the general financial health of these companies: liquidity ratios (Current, Quick), profitability/equity ratios (ROA, ROE), leverage ratios (Debt to Equity), and market value ratios (Price Earnings Ratio).

Another paper that is related to the financial performance of petroleum companies belongs to Hazarika (2015). This study was undertaken to analyze the financial performance in terms of profitability, efficiency, liquidity and financial health of top five oil and gas companies worldwide based on revenues, net income, market value and principal operations with reference to crude oil prices. In this regard, the following ratios were used to investigate the general financial health of these companies: liquidity ratios (Current), efficiency ratios (Asset Turnover, Inventory Turnover, and Receivables Turnover), profitability/equity ratios (ROA, ROE, and ROC), and leverage ratios (Debt to Equity).

Within the framework of these papers, a comparative list of financial ratios that were used to measure the financial performance of petroleum companies is presented below:

Table 2.2: Comparative Prior Research

Classification of Ratios	**Jurkowski & Daly (2015)**	**Hazarika (2015)**
Liquidity	Current Ratio, Quick Ratio	Current Ratio
Efficiency Ratios	None	Asset Turnover, Inventory Turnover, Receivables Turnover
Profitability/Equity Ratios	ROA, ROE	ROA, ROE, ROC
Leverage Ratios	Debt to Equity	Debt to Equity
Market Value Ratios	Earnings per Share, Price Earnings Ratio	None

By taking the prior research into consideration, **chapter 5** of this thesis will contribute to the accounting literature in the following issues: (1) analysis of the financial position and (2) financial performance of the major upstream quoted IFRS petroleum companies.

In addition, this thesis improves the paper of Jurkowski & Daly (2015) that states that investing into the shares of petroleum companies is based on investor's preference and risk tolerance within the framework of ratio analysis, particularly in the context of ROA, ROE, earning per share and price-earnings ratio. However, this research focuses on portfolio optimization in addition to ratio analysis to try to meet reasonable information needs on investor's preference and risk tolerance in terms of risk minimization and return maximization. It creates portfolios that are made up of the shares of petroleum and develops different investment scenarios using a variety of returns and risk scenarios. **Chapter 6** was designed to improve what was stated by the paper of Jurkowski & Daly (2015).

CHAPTER 3

RESEARCH DATA AND METHODOLOGY

Chapter 3 organizes the data and methodology of this research under the following sub-headings: (1) Research Methodology; (2) Research Design; (3) Research Sample; (4) Research Instrument; and (5) Procedure for Data Collection.

3.1. Research Methodology

This thesis uses a quantitative research method. The data for accounting policies and financial performance analysis are hand-collected from financial statements. Data related to accounting policies and financial performance analysis uses frequency distribution method and financial ratios, respectively as research methodology. In addition, the data for portfolio optimization is hand-collected as well from company's investor relations websites or from respected finance websites. This data uses computerized financial spreadsheet applications as research methodology.

3.2. Research Design

Research design of this thesis is in the form of a quantitative interpretive study where the research on accounting policies, financial performance analysis and portfolio optimization are realized, quantified and interpreted.

3.3. Research Sample

For the purpose of this research, four samples were established based on the list of largest oil and gas companies by revenue published by Wikipedia in 2015.

First of all, in order to focus on petroleum companies, gas companies presented in Wikipedia list were eliminated unless one company has both oil and gas exploration operations. In this regard, it should be noted that these four samples cover the major upstream petroleum companies according to the revenue constraint.

In the context of the first sample, major upstream non-IFRS and IFRS petroleum companies whose shares are quoted in stock exchanges were selected to determine the trend of GAAP in this industry except for the fact that one non-quoted company (Turkish Petroleum) is added to the sample from Turkey as part of the contribution of the paper of Karapınar (2012).

This first sample consists of 30 companies in the global context. It refers to 21 countries from all continents except Africa. It covers companies from Austria, Brazil, Canada, China, Colombia, France, Greece, Hong Kong, India, Italy, Japan, Malaysia, Mexico, Netherlands, Norway, Russia, Spain, Thai, Turkey, United Kingdom, and US. It shows a combination of non-IFRS + IFRS based geographical diversification of this industry as seen on **Table 3.1**.

In the second sample, non-IFRS companies were eliminated from the first sample to focus on the accounting policy choices of major upstream IFRS petroleum companies. This sample consists of 23 companies in the global context. It refers to 18 countries from all continents except Africa. It covers companies from Austria, Brazil, Canada, China, Colombia, France, Greece, Hong Kong, Italy, Malaysia, Mexico, Netherlands, Norway, Russia, Spain, Thai, Turkey, and United Kingdom. It shows a combination of IFRS based geographical diversification of this industry. These companies are shown in **Table 3.2**.

The third sample is made up of major upstream quoted IFRS petroleum companies whose 2015 ROA and ROE ratios are positive and whose earnings per share is available on the annual reports for the purpose of financial performance analysis. In this regard, Petronas whose earnings per share is not available in its annual report as well as Turkish Petroleum whose shares are not quoted in Borsa Istanbul were excluded from the sample. The sample consists of 10 companies. These companies are shown in **Table 3.3**.

Table 3.1: Major Upstream Non-IFRS + IFRS Petroleum Companies

NUMBER	COMPANY	COUNTRY	GAAP
1	OMV Group	Austria	IFRS
2	Petrobras	Brazil	IFRS
3	Suncor Energy	Canada	IFRS
4	Petro China	China	IFRS
5	Sinopec	China	IFRS
6	Eco petrol	Colombia	IFRS
7	Total	France	IFRS
8	Hellenic Petroleum	Greece	IFRS
9	Motor Oil Hellas	Greece	IFRS
10	China National	Hong Kong	IFRS
11	Eni	Italy	IFRS
12	Petronas	Malaysia	IFRS
13	Pemex	Mexico	IFRS
14	Statoil	Norway	IFRS
15	Rosneft	Russia	IFRS
16	Gazprom	Russia	IFRS
17	Lukoil	Russia	IFRS
18	Cepsa	Spain	IFRS
19	PTT	Thai	IFRS
20	Turkish Petroleum	Turkey	IFRS
21	BP	United Kingdom	IFRS
22	Royal Dutch Shell	UK / NL	IFRS
23	Centrica	United Kingdom	IFRS
24	Exonmobil	US	US GAAP
25	Chevron	US	US GAAP
26	ConocoPhillips	US	US GAAP
27	Reliance	India	Indian GAAP
28	Baharat	India	Indian GAAP
29	Indian oil corporation	India	Indian GAAP
30	JX Holding	Japan	Japan GAAP

Table 3.2: Major Upstream IFRS Petroleum Companies

NUMBER	COMPANY	COUNTRY	GAAP
1	OMV Group	Austria	IFRS
2	Petrobras	Brazil	IFRS
3	Suncor Energy	Canada	IFRS
4	Petro China	China	IFRS
5	Sinopec	China	IFRS
6	Eco petrol	Colombia	IFRS
7	Total	France	IFRS
8	Hellenic Petroleum	Greece	IFRS
9	Motor Oil Hellas	Greece	IFRS
10	China National	Hong Kong	IFRS
11	Eni	Italy	IFRS
12	Petronas	Malaysia	IFRS
13	Pemex	Mexico	IFRS
14	Statoil	Norway	IFRS
15	Rosneft	Russia	IFRS
16	Gazprom	Russia	IFRS
17	Lukoil	Russia	IFRS
18	Cepsa	Spain	IFRS
19	PTT	Thai	IFRS
20	Turkish Petroleum	Turkey	IFRS
21	BP	United Kingdom	IFRS
22	Royal Dutch Shell	UK / NL	IFRS
23	Centrica	United Kingdom	IFRS

Table 3.3: Major Upstream Quoted IFRS Petroleum Companies

NUMBER	COMPANY	COUNTRY	STOCK EXCHANGE
1	Petro China	China	IFRS - Hong Kong
2	Total	France	IFRS - Paris
3	Hellenic Petroleum	Greece	IFRS - Athens
4	Motor Oil Hellas	Greece	IFRS - Athens
5	China National	China	IFRS - Hong Kong
6	PTT	Thai	IFRS - Thailand
7	Rosneft	Russia	IFRS - London
8	Gazprom	Russia	IFRS - London
9	Lukoil	Russia	IFRS - London
10	Royal Dutch Shell	UK / NL	IFRS - London

The fourth sample covers major upstream quoted IFRS petroleum companies whose 2015 ROA and ROE ratios are positive, whose earnings per share is available and whose number of missing share price observations are acceptable/tolerable levels. In this context, Petronas and PTT were excluded from this sample. This sample consists of 9 companies that are shown in **Table 3.4**.

Table 3.4: Major Upstream IFRS Petroleum Companies for Portfolio Optimization

NUMBER	COMPANY	COUNTRY	STOCK EXCHANGE
1	Petro China	China	IFRS - Hong Kong
2	Total	France	IFRS - Paris
3	Hellenic Petroleum	Greece	IFRS - Athens
4	Motor Oil Hellas	Greece	IFRS - Athens
5	China National	China	IFRS - Hong Kong
6	Rosneft	Russia	IFRS - London
7	Gazprom	Russia	IFRS - London
8	Lukoil	Russia	IFRS - London
9	Royal Dutch Shell	UK / NL	IFRS - London

3.4. Research Instruments

In order to gather the data three research instruments were used during the research process:

(1) For the purpose of collecting data on accounting policies, a checklist was prepared to find out the results of the following 18 hypothesis:

a. **H1:** Major upstream petroleum companies are inclined to adopt their country of domicile's local GAAP in terms of financial reporting rather than IFRS.

b. **H2:** Major upstream IFRS petroleum companies are inclined to use the title of "Statement of Financial Position" rather than "Balance Sheet".

c. **H3:** Major upstream IFRS petroleum companies are inclined to prepare a Statement of Financial Position according to liquidity order rather than current/non-current distinction.

d. **H4:** Major upstream IFRS petroleum companies are inclined to prepare a Statement of Financial Position in liquidity decreasing order rather than liquidity increasing.

e. **H5:** Major upstream IFRS petroleum companies are inclined to prepare a Statement of Financial Position in the format of "Assets = Liabilities + Equity" rather than "Assets - Liabilities = Equity".

f. **H6:** Major upstream IFRS petroleum companies are inclined to prepare a Statement of Profit or Loss by function rather than by nature.

g. **H7:** Major upstream IFRS petroleum companies are inclined to prepare "Statement of Comprehensive Income" using one statement approach rather than two statement approach.

h. **H8:** Major upstream IFRS petroleum companies are inclined to prefer First-in First-Out (FIFO) as their cost flow assumptions rather than Weighted Average (WA).

i. **H9:** Major upstream IFRS petroleum companies are inclined to prefer “direct method” rather than “indirect method” in reporting cash flows from operations on the Statement of Cash Flows.

j. **H10:** Major upstream IFRS petroleum companies are inclined to report “dividend paid” on the operating section of the Statement of Cash Flows rather than financing section of the Statement of Cash Flows.

k. **H11:** Major upstream IFRS petroleum companies are inclined to report “interest paid” on the operating section of the Statement of Cash Flows rather than financing section of the Statement of Cash Flows.

l. **H12:** Major upstream IFRS petroleum companies are inclined to report “interest received” on the operating section of the Statement of Cash Flows rather than investing section of the Statement of Cash Flows.

m. **H13:** Major upstream IFRS petroleum companies are inclined to report “dividend received” on the operating section of the Statement of Cash Flows rather than investing section of the Statement of Cash Flows.

n. **H14:** Major upstream IFRS petroleum companies are inclined to depreciate their property, plant and equipment according to straight-line depreciation and/or units of production rather than double-declining balance.

o. **H15:** Major upstream IFRS petroleum companies are inclined to recognize their property, plant and equipment according to revaluation model rather than cost model after the initial recognition.

p. **H16:** Major upstream IFRS petroleum companies are inclined to recognize their intangible assets according to revaluation model rather than cost model after the initial recognition.

q. **H17:** Major upstream IFRS petroleum companies are inclined to recognize their investment property according to fair value model rather than cost model after the initial recognition.

r. **H18:** Major upstream IFRS petroleum companies are inclined to report their exploration and evaluation expenditures on petroleum resources using "Full Cost Method" rather than "Successful Efforts Method".

(2) For the purpose of collecting data on financial performance analysis, the author prepared spreadsheets to calculate financial ratios and transformed those quantitative data into bar charts.

(3) For the purpose of collecting data on portfolio optimization, the author used appropriate spreadsheet functions in the context of return maximization and risk minimization.

3.5. Procedure for Data Collection

In order to collect the data, audited 2015 annual reports and share prices of the petroleum companies were downloaded into the personal computer of the author in terms of accounting policies, financial performance analysis and portfolio optimization.

CHAPTER 4

RESEARCH FINDINGS ON ACCOUNTING POLICIES REGARDING MAJOR UPSTREAM PETROLEUM COMPANIES

This chapter provides research findings about the GAAP adopted by the major upstream petroleum companies and accounting policy choices adopted by the major upstream IFRS petroleum companies.

4.1. Generally Accepted Accounting Practices Adopted by Major Upstream Petroleum Companies

H1: Major upstream petroleum companies are inclined to adopt their country of domicile's local GAAP in terms of financial reporting rather than IFRS.

This hypothesis was rejected by the research findings because it was observed that 23 petroleum companies prepare their financial statements in accordance with IFRS regardless of their country of domicile, and the remaining 7 companies prefer adopting their local GAAP in terms of financial reporting (US GAAP, Indian GAAP, and Japan GAAP). These findings also indicate that the majority of the sampled petroleum companies (76%) either listed or non-listed are inclined to prepare their financial reports in accordance with IFRS rather than local GAAP in order to provide international comparability within the sector as seen on **Table 4.1** and **Figure 4.1**.

Table 4.1: Adoption of Different GAAP among Petroleum Companies

Generally Accepted Accounting Practices	Number of Companies
IFRS	23
US GAAP	3
Indian GAAP	3
Japan GAAP	1
TOTAL	**30**

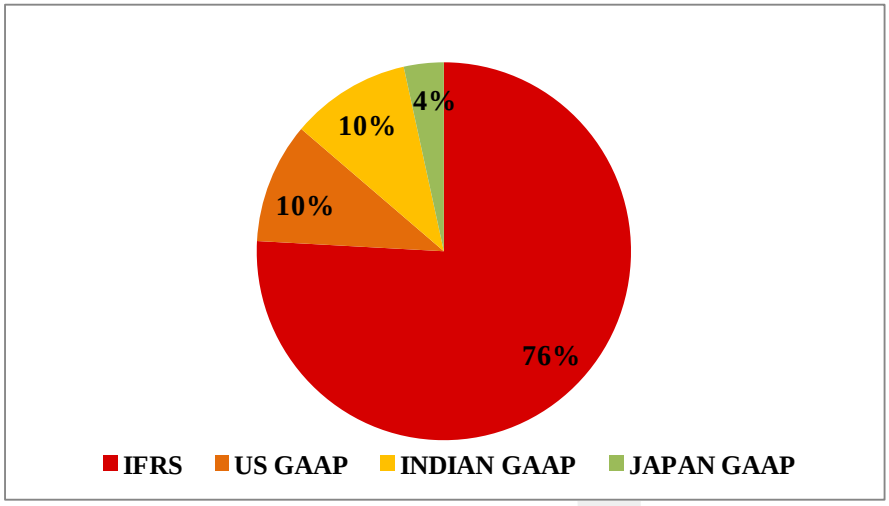

Figure 4.1: GAAP among Major Upstream Petroleum Companies

4.2. Accounting Policy Choices Adopted by Major Upstream IFRS Petroleum Companies

4.2.1. Brief Summary of IAS 1 Presentation of Financial Statements

IAS 1 is the main part of financial statements preparation and presentation (IASB 2015, 38-40). It declares a complete set of financial statements. In this context, a complete set of financial statements, which should be comparatively presented, at least annually, includes:

- A statement of financial position (sometimes called the balance sheet);
- Either: a single statement of profit or loss and other comprehensive income; or two statements—a statement of profit or loss (sometimes called an income statement either by function or by nature), and a statement of comprehensive income (starting with profit or loss and presenting income and expenses that are not recognized in profit or loss);
- A statement of changes in equity;
- A statement of cash flows; and

- Notes, contains a summary of significant accounting policies, management judgments, estimations and explanatory information.

Financial statements must present fairly and clearly the financial position, financial performance and cash flows of an entity and are prepared on a going concern basis that is, assessing that the entity will continue its operations for the expecting future.

Assets and liabilities are classified as current or non-current, except when a presentation based on liquidity would provide information that is reliable and more relevant.

4.2.2. Research Findings related to IAS 1

1. **H2:** Major upstream IFRS petroleum companies are inclined to use the title of "Statement of Financial Position" rather than "Balance Sheet".

According to the research findings, even if IAS 1 primarily prefers the title of "Statement of Financial Position", the slightly dominant practice between the use of the title of "Statement of Financial Position" and "Balance Sheet" among the major upstream IFRS petroleum companies is "Balance Sheet". That is why this hypothesis was rejected as seen on **Table 4.2**.

Table 4.2: Title of Statement of Financial Position

	Number of Companies	**%**
Balance Sheet	12	52%
Statement of Financial Position	11	48%
TOTAL	**23**	**100%**

2. **H3:** Major upstream IFRS petroleum companies are inclined to prepare a Statement of Financial Position according to liquidity order rather than current/non-current distinction.

According to the research findings, major upstream IFRS petroleum companies are fully inclined to prepare a "Statement of Financial Position" according current/non-current distinction of assets and liabilities. They easily classify their assets and liabilities in this context. It looks like that they don't experience any reporting problem to switch from current/non-current distinction to prefer presentation based on liquidity. That is why this hypothesis was rejected as seen on **Table 4.3**.

Table 4.3: Classification of Assets and Liabilities

	Number of Companies	**%**
Liquidity order	0	0%
Current/non-current distinction	23	100%
TOTAL	**23**	**100%**

3. **H4:** Major upstream IFRS petroleum companies are inclined to prepare a Statement of Financial Position in liquidity decreasing order rather than liquidity increasing.

According to the research findings, the slightly dominant practice between the classification of assets and liabilities is in liquidity decreasing order in this industry. That is why this hypothesis was accepted as seen on **Table 4.4**.

Table 4.4: Classification of Assets and Liabilities

	Number of Companies	**%**
Current/non-current distinction	12	52%
Non-current/current distinction	11	48%
TOTAL	**23**	**100%**

4. **H5:** Major upstream IFRS petroleum companies are inclined to prepare a Statement of Financial Position in the format of "Assets = Liabilities + Equity" rather than "Assets - Liabilities = Equity".

According to the research findings, major upstream IFRS petroleum companies prepare their statement of financial position using three different formats: (1) US GAAP, (2) EU (Continental European), and (3) EU (Anglo Saxon).

In this context, the figures related to these three different formats of statement of financial position are provided below.

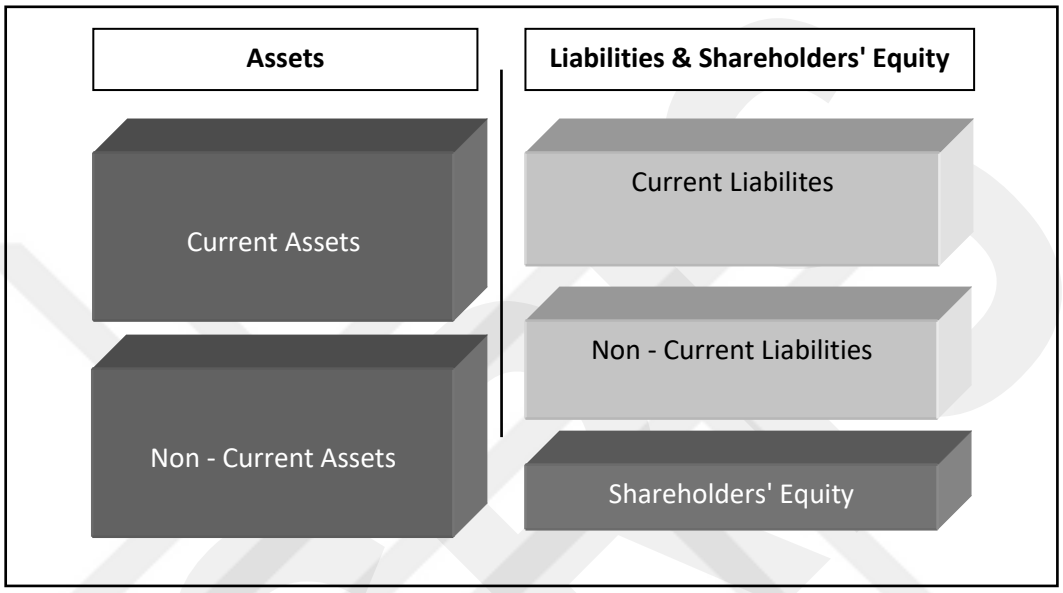

Figure 4.2: US GAAP Format of Statement of Financial Position

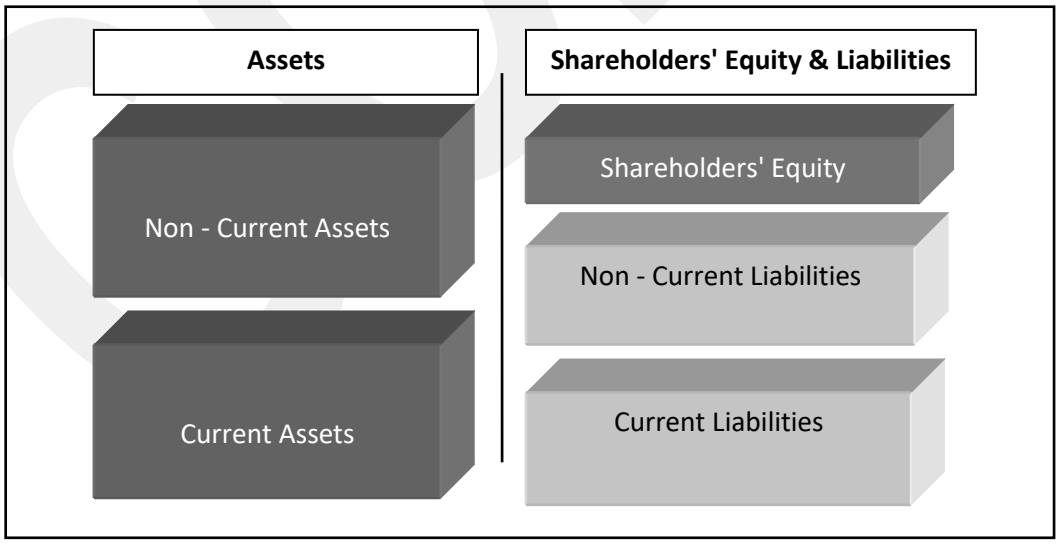

Figure 4.3: EU Continental European Format of Statement of Financial Position

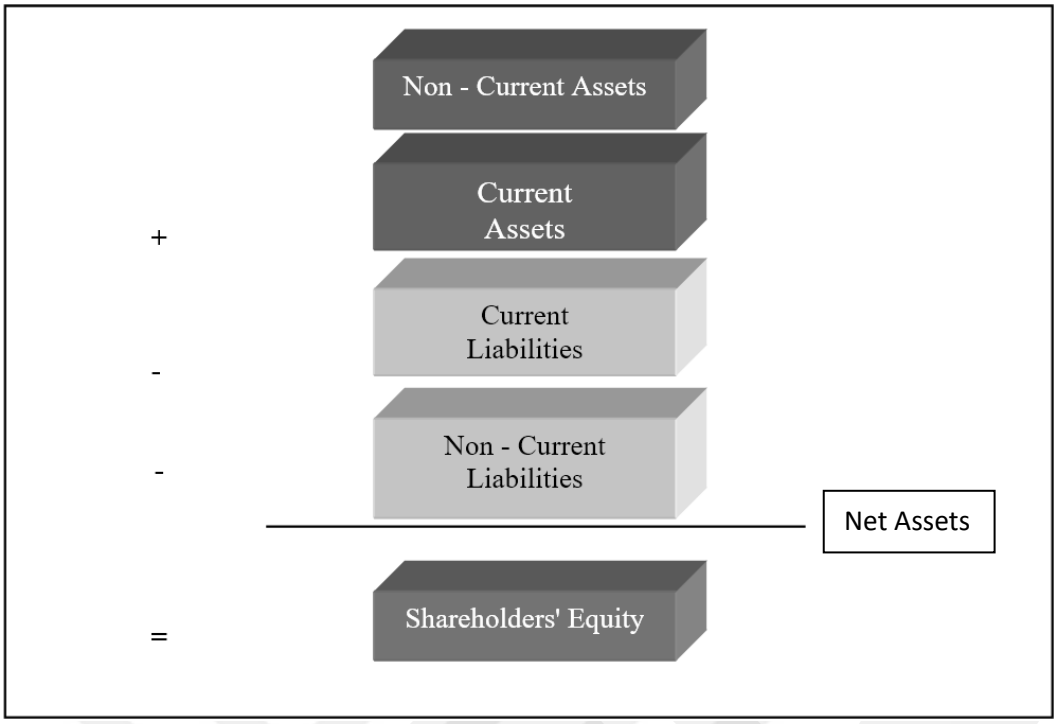

Figure 4.4: EU Anglo-Saxon Format of Statement of Financial Position

In this research, due to the fact that IFRS research sample is made up of petroleum companies whose country of domicile is from different continents of the world, it is possible to observe different formats of balance sheet under the influence of these countries' local accounting practice as seen on **Table 4.5**. Prior research also proves this fact (Akdoğan & Öztürk 2015).

Table 4.5: Format of the Statement of Financial Position

	Number of Companies	**%**
US GAAP	12	52%
EU - Continental European	8	35%
EU - Anglo Saxon	3	13%
TOTAL	**23**	**100%**

According to the research findings, the majority of the sampled IFRS petroleum companies are inclined to prepare a Statement of Financial Position in

the format of "Assets = Liabilities + Equity" in the context of US GAAP and Continental European formats. That is why this hypothesis was accepted.

5. **H6:** Sampled IFRS petroleum companies are inclined to prepare a Statement of Profit or Loss by function rather than by nature.

According to the research findings, the slightly dominant practice regarding the preparation of an income statement is by function in this industry. That is why this hypothesis was accepted as seen on **Table 4.6**.

Table 4.6: Format of the Statement of Profit or Loss

	Number of Companies	**%**
By Function	12	52%
By Nature	11	48%
TOTAL	**23**	**100%**

6. **H7:** Major upstream IFRS petroleum companies are inclined to prepare "Statement of Comprehensive Income" using one statement approach rather than two statement approach.

According to the research findings, the slightly dominant practice in the preparation of a statement of comprehensive income is the statement with one-statement approach. That is why this hypothesis was accepted as seen on **Table 4.7**.

Table 4.7: Format of the Statement of Comprehensive Income

	Number of Companies	**%**
One-statement approach	12	52%
Two-statement approach	11	48%
TOTAL	**23**	**100%**

Within the framework of these 6 hypotheses regarding IAS 1, this research points out that the differentiation in accounting practices still exists among the major upstream IFRS petroleum companies.

4.2.3. Brief Summary of the IAS 2 Inventory

Inventories are assets held for sale as soon as it is finished goods (IASB 2015, 41-42). Moreover, raw materials and supplies all are considered inventories to be consumed in the production process.

Inventory is measured initially at its cost to the entity, either the cost of buying it or the cost of producing it. The cost of finished goods comprises raw materials, direct labor, other direct costs and related production overheads, but excludes borrowing costs.

Inventories are measured in the statement of financial position at their cost or, if lower, net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less the cost of completion and selling expenses.

Consequently, the cost of items of inventory that are neither unique nor segregated for specific projects is assigned using either the first-in, first-out (FIFO) or the weighted average cost formula. The same cost formula must be used for all inventories having a similar nature and use.

4.2.4. Research Findings related to IAS 2

1. **H8:** Major upstream IFRS petroleum companies are inclined to prefer FIFO as their cost flow assumptions rather than WA.

According to the research findings, the majority of major upstream IFRS petroleum companies prefer WA method rather than FIFO method as their cost flow assumptions. This result is in parallel to the prior research of Jaafar & Mcleay (2007) because this prior research indicates that resource-based industry like petroleum industry focuses on primarily WA and then FIFO in the European context with a large sample size. This hypothesis was rejected as seen on **Table 4.8**.

Table 4.8: Inventory Cost Flow Assumptions

	Number of Companies	**%**
FIFO	5	22%
WA	16	70%
FIFO + WA	1	4%
Not Stated	1	4%
TOTAL	**23**	**100%**

Within the framework of this hypothesis regarding IAS 2, this research points out that the differentiation in accounting practice still exists among the IFRS petroleum companies but the differentiation in cost flow assumptions is much more balanced than the results related to IAS 1.

4.2.5. Brief Summary of IAS 7 Statement of Cash Flows

The statement of cash flows is one of the most important statements in the financial statements (IASB 2015, 43-44). A statement of cash flows provides information to users of financial statements to evaluate the changes in the net assets of the entity, its financial position including liquidity and solvency, and its ability to affect the amounts and timing of cash flows in order to adapt to changing circumstances and opportunities.

The statement of cash flows describes the movements in cash and cash equivalents. IAS 7 requires the cash flows to be classified into three activities; investing, financing and operating.

Investing activities comprise the acquisition and disposal of long-term assets and investments that are not cash equivalents. Examples include a cash payment to purchase machinery and a cash payment to purchase equity investments.

Financing activities cover changes in the borrowings and in the contributed equity capital of the entity. Examples include a cash payment to redeem preference shares, cash proceeds from issuing debentures and the capital element of a lessee's payment under a finance lease.

Operating activities cover the revenue-producing activities of the entity, and all other activities that are neither investing nor financing. Examples include the cash received from customers for goods sold to them and cash paid to suppliers for goods and services, such as gas and electricity that were purchased from them.

The Standard allows cash flows from operating activities to be presented using either the direct method or indirect method versus cash flows from investing and financing activities must be presented using the direct method. According to the direct method, major classes of gross cash receipts and gross cash payments are shown, for example, the cash received from customers is shown; whereas, according to the indirect method, the starting point is profit or loss and this is adjusted for non-cash items, for example, depreciation and the increase, or decrease, in trade receivables, to determine net cash inflow, or outflow, from operating activities.

In addition, dividend paid and received as well as interest paid and received is classified as follows:

1. **Dividend paid:** Can be classified as operating or financing cash flows. Similarly, for non-financial companies,
2. **Interest paid:** Can be classified as operating or financing cash flows, whereas
3. **Interest and dividend received:** Can be classified as operating or investing cash flows.

4.2.6. Research Findings related to IAS 7

1. **H9:** Major upstream IFRS petroleum companies are inclined to prefer "direct method" rather than "indirect method" in reporting cash flows from operations on the Statement of Cash Flows.

According to the research findings, the majority of the major upstream IFRS petroleum companies are inclined to prefer "indirect method" rather than "direct method" as seen on **Table 4.9**. That is why this hypothesis was rejected.

Table 4.9: Format of the Cash Flows from Operations

	Number of Companies	**%**
Direct Method	6	26%
Indirect Method	16	70%
Not Stated	1	4%
TOTAL	**23**	**100%**

2. **H10:** Major upstream IFRS petroleum companies are inclined to report "dividend paid" on the operating section of the Statement of Cash Flows rather than financing section of the Statement of Cash Flows.

According to the research findings, almost all IFRS petroleum companies are inclined to report "dividend paid" on the financing section of the Statement of Cash Flows rather than operating section of the Statement of Cash Flows as seen on **Table 4.10**. That's why this hypothesis was rejected.

Table 4.10: Classification of Dividend Paid

	Number of Companies	**%**
Operating	1	4%
Financing	21	92%
Not Stated	1	4%
TOTAL	**23**	**100%**

3. **H11:** Major upstream IFRS petroleum companies are inclined to report "interest paid" on the operating section of the Statement of Cash Flows rather than financing section of the Statement of Cash Flows.

According to the research findings, more than half of IFRS petroleum companies are inclined to report "interest paid" on the financing section of the Statement of Cash Flows rather than operating section of the Statement of Cash Flows as seen on **Table 4.11**. That's why this hypothesis was rejected.

Table 4.11: Classification of Interest Paid

	Number of Companies	**%**
Operating	8	35%
Financing	13	57%
Not Stated	2	8%
TOTAL	**23**	**100%**

4. **H12:** Major upstream IFRS petroleum companies are inclined to report "interest received" on the operating section of the Statement of Cash Flows rather than investing section of the Statement of Cash Flows.

According to the research findings, almost half of the IFRS petroleum companies are inclined to report "interest received" on the investing section of the Statement of Cash Flows rather than operating section of the Statement of Cash Flows as seen on **Table 4.12**. That's why this hypothesis was rejected.

Table 4.12: Classification of Interest Received

	Number of Companies	**%**
Operating	7	30%
Investing	10	44%
Financing	1	4%
Not Stated	5	22%
TOTAL	**23**	**100%**

5. **H13:** Major upstream IFRS petroleum companies are inclined to report "dividend received" on the operating section of the Statement of Cash Flows rather than investing section of the Statement of Cash Flows.

According to the research findings, the majority of the IFRS petroleum companies are inclined to report "dividend received" on the investing section of the Statement of Cash Flows rather than operating section of the Statement of Cash Flows as seen on **Table 4.13**. That's why this hypothesis was rejected.

Table 4.13: Classification of Dividend Received

	Number of Companies	**%**
Operating	6	26%
Investing	13	56%
Not Stated	4	18%
TOTAL	**23**	**100%**

Within the framework of these 5 hypotheses regarding IAS 7, this research points out that the differentiation in accounting practices still exists among the

major upstream IFRS petroleum companies. However, the differentiation regarding the cash flow statement is much more balanced among the companies compared to the results related to IAS 1.

4.2.7. Brief Summary of IAS 16 Property, Plant & Equipment

Almost all businesses own property, plant and equipment such as director office building, machinery to manufacture the products or vehicles for delivery (IASB 2015, 54-57). IAS 16 set out the procedures to clarify how to account for these assets.

PPE items are recorded initially at their cost, which includes all expenditure to get the item ready for use. Cost is measured as the fair value of what is paid, so if payment is deferred beyond normal credit terms, cost is the present value of the cash payment.

Because the item will be used over more than one accounting period, it is recognized as an asset in the statement of financial position. The cost does nevertheless need to be recognized as an expense, and depreciation is the method of accounting that is used to recognize that cost, or the relevant part of it, as an expense as the asset is consumed through its use in the business.

After acquisition, an entity may choose to measure PPE items either at cost less accumulated depreciation and accumulated impairment, or at a revalued amount, namely at its fair value at the date of valuation less any subsequent accumulated depreciation and accumulated impairment. If an entity chooses the revaluation model, valuations must be performed with sufficient regularity to ensure that the carrying amount of the asset does not differ materially from its fair value at the end of the reporting period and all assets within the same class of property, plant and equipment must be revalued.

4.2.8. Research Findings Related to IAS 16

1. **H14:** Major upstream IFRS petroleum companies are inclined to depreciate their PPE items according to straight-line depreciation and/or units of production rather than double-declining balance.

According to the research findings, 40% of major upstream IFRS petroleum companies are inclined to depreciate their PPE items (including oil and gas production assets) using the straight-line depreciation method. However, more than half of the companies use units of production method to depreciate their oil and gas properties (oil and gas production assets) and straight-line method to depreciate their non-oil and non-gas PPE items.

This result is not in parallel to the prior research of Jaafar & Mcleay (2007) because this research with a large sample size indicates that resource-based industry focuses on primarily straight-line and then units of production under local GAAP in Europe. However, the findings of this thesis look like that current trend of recording depreciation of PPE items of IFRS petroleum companies moved to a combination of straight-line method and units of production methods for better financial reporting by considering depletion. In this context, by making a further research with a large sample size, it should be questioned whether this prior research still holds under IFRS practice or IFRS petroleum companies are inclined to prefer a combination of these two methods. Overall, this hypothesis holds in terms of PPE items other than oil and gas properties as seen on **Table 4.14.**

Table 4.14: Depreciation Methods Preferred by IFRS Petroleum Companies

	Number of Companies	**%**
Straight-line Depreciation	9	40%
Units of Production	0	0%
Declining Balance (Double Declining)	0	0%
Straight-line + Units of Production	13	56%
Not Stated	1	4%
TOTAL	**23**	**100%**

2. **H15:** Major upstream IFRS petroleum companies are inclined to recognize their PPE items according to revaluation model rather than cost model after the initial recognition.

According to the research findings, major upstream IFRS petroleum companies are fully inclined to recognize their PPE items according to cost model. That is why this hypothesis was rejected seen on **Table 4.15**. This result shows that IFRS petroleum companies are conservative in recognizing their PPE items after the initial recognition and they don't want to state their PPE items at their revalued amounts because revaluation creates an additional cost for companies to acquire an expertise report that states the current market value of the PPE items.

Table 4.15: PPE Accounting Policy Choice After Initial Recognition

	Number of Companies	**%**
Cost Model	23	100%
Revaluation Model	0	0
Cost + Some Revaluation	0	0
TOTAL	**23**	**100%**

4.2.9. Brief Summary of IAS 38 Intangible Assets

An intangible asset is an identifiable non-monetary asset without physical substance; for example, computer software, licenses, patents and copyrights (IASB 2015, 96-98). Identifiable assets mean either it is sold separately from the business or it is arises from contractual or legal rights regardless of whether it is separable.

Many intangible assets have unique nature results in IAS 38 contain a safeguards and guidance. Intangible assets are measured at cost (1) if acquired separately at initial recognition; (2) if internally generated (self‑constructed if tangible) at initial recognition; and (3) at fair value on initial recognition if acquired in a business combination.

Subsequently, they are measured using either the cost model or the revaluation model: (1) In accordance with the cost model, assets are measured at cost less accumulated depreciation/ amortization less accumulated impairment losses; (2) In accordance with the revaluation model, assets are carried at fair value less subsequent accumulated depreciation/amortization less subsequent accumulated impairment losses. When assets measured at fair value it must be measured by reference to an active market. Because active markets for intangible assets are uncommon, it will be rare for any intangible assets to be revalued.

4.2.10. Research Findings Related to IAS 38

1. **H16:** Major upstream IFRS petroleum companies are inclined to recognize their intangible assets according to revaluation model rather than cost model after the initial recognition.

According to the research findings, IFRS petroleum companies are fully inclined to recognize their intangible assets according to cost model as seen on **Table 4.16**. That is why, this hypothesis was rejected. This result shows that there is no active market for intangible assets owned by IFRS petroleum companies. That is why this hypothesis was rejected.

Table 4.16: Intangible Assets Accounting Policy Choice After Initial Recognition

	Number of Companies	**%**
Cost Model	23	100%
Revaluation Model	0	0
Cost + Some Revaluation	0	0
TOTAL	**23**	**100%**

4.2.11. Brief Summary of IAS 40 Investment Property

Investment property is land and/or buildings, or part of a building, held to earn rentals and/or for capital appreciation rather than held for use in the production or supply of goods or services, or for administrative purposes or held for sale in the ordinary course of business (IASB 2015, 104-105).

Investment property is initially measured at its cost, including related transaction costs. On subsequent measurement, an entity must adopt either the fair value model or the cost model for all investment properties.

IASB had proposed requiring the use of fair value for all investment property. Although fair value provides more useful information, it permitted this choice to give preparers and users time to gain experience with using a fair value model and to allow time for countries with less-developed property markets and valuation professions to mature.

All companies must estimate the fair value of their investment properties. Fair value reflects the rental income from current leases and market conditions at the end of the reporting period.

Under the fair value model, investment property is remeasured at the end of each reporting period. However, under the cost model, investment property is measured at cost less accumulated depreciation and any accumulated impairment losses.

4.2.12. Research Findings Related to the Standard IAS 40

1. **H17:** Major upstream IFRS petroleum companies are inclined to recognize their investment property according to fair value model rather than cost model after the initial recognition.

In this research, there are a limited number of major IFRS petroleum companies that report investment properties. Among all, three of them prefer cost model after the initial recognition and one of them (Turkish Petroleum) prefer fair value model. Those prefer the cost model is reluctant to prefer fair value model in order not to create additional costs of valuation. Due to the limited number of observations, this hypothesis was neither accepted nor rejected.

Table 4.17: Investment Property Accounting Policy Choice After Initial Recognition

	Number of Companies	**%**
Cost Model	3	75%
Fair Value Model	1	25%
TOTAL	**4**	**100%**

4.2.13. Brief Summary of IFRS 6 Exploration for and Evaluation of Mineral Resources

Mineral resources include minerals, oil, natural gas and similar non-regenerative resources (IASB 2015, 24-25). An entity must determine accounting policies specifying which exploration and evaluation expenditures are to be recognised as assets. In accordance with IAS 8, an entity may continue to account for exploration and evaluation expenditures using the same accounting policies that it applied immediately before adopting IFRS such as FCM, SEM or Area of Interest.

4.2.14. Research Findings Related to IFRS 6

1. **H18:** Major upstream IFRS petroleum companies are inclined to report their exploration and evaluation expenditures of petroleum resources using "FCM" rather than "SEM".

Before analyzing the research findings, it would be meaningful to refer to prior research in detail as seen on **Table 4.18**.

In this context, using the data generated from the year 2008, the findings of the paper of Karapınar et al. (2012) states that four IFRS petroleum companies among the world's top 25 firms as of the year 2009 preferred SEM versus one IFRS petroleum company preferred FCM. The same paper also emphasized that Turkish Petroleum also preferred SEM from the perspective of Turkish oil companies whose data are available.

Another research that deals with the accounting policy choice on oil and gas companies from around the world belongs to Abdo (2016). The author established a sample of petroleum and gas companies whose shares are traded in different stock exchanges such as London, Hang Seng, and Toronto Stock Exchange. According to the results, 47% of the sample prefers SEM, 28% of the sample prefers FCM, and 9% of the sample prefers Area of Interest Method which is a not very often mentioned method in the petroleum and gas industry accounting according to prior research of Noel et al. (2010) and Power et al. (2017).

In addition, Power et al. (2017), using the data generated from the year 2006 - 2012, prepared a paper on the accounting policies on extractive companies whose shares are quoted in London Stock Exchange. Accounting policy choice on extractive industry consists of one of the aspects of this paper. By creating a sample that is made up of 84 petroleum and gas companies, the authors determined that 71% of petroleum and gas companies preferred SEM versus 29% of oil and gas companies preferred FCM for the purpose of IFRS based financial reporting.

Table 4.18: Comparative Research on Petroleum Accounting Policy Choice

	Karapınar et al. (2012)	**Abdo (2016)**	**Power et al. (2017)**	**Current Research**
Sample Size	N = 6	N = 118	N = 84	N = 23
FCM	1	33	24	1
SEM	5	55	60	21
Area of Interest	-	11	-	-
Not Stated	-	19	-	1
TOTAL	**6**	**118**	**84**	**23**

In parallel to the findings of prior research mentioned above, current research findings show that almost all major upstream IFRS petroleum companies (92%) prefer SEM rather than FCM as seen on **Table 4.18**. This result rejects the hypothesis. Findings indicate that major upstream IFRS petroleum companies try to focus on SEM to provide comparable information within the industry.

CHAPTER 5

RESEARCH FINDINGS ON FINANCIAL PERFORMANCE ANALYSIS OF MAJOR UPSTREAM QUOTED IFRS PETROLEUM COMPANIES

This chapter provides research findings about the financial performance analysis of major upstream quoted IFRS petroleum companies whose 2015 ROA and ROE are positive and whose earnings per share is available. This chapter starts with (1) Profitability analysis and follows the following subsections: (2) Liquidity analysis; (3) Efficiency analysis; (4) Leverage analysis; and (5) Overall Financial Analysis of these companies.

5.1. Profitability Analysis

To understand the profitability analysis of a company, ROA and ROE may be used as two of the several financial metrics to assess a company's ability to generate earnings as compared to its expenses and other relevant costs incurred during a specific period of time according to prior research of Jurkowski and Daly (2015) as well as Hazarika (2015).

5.1.1. Return on Assets

According to Hazarika (2015), this ratio gives an idea as to how efficient management is at using its assets to generate earning. In this context, the following issues are pointed out as seen on **Figure 5.1**:

1. In 2014, 8 companies have positive ROA versus 10 companies have positive ROA in 2015. This shows that two companies (Motor Oil Hellas and

Hellenic Petroleum) experienced a loss in 2014. However, they recovered their profitability in 2015.

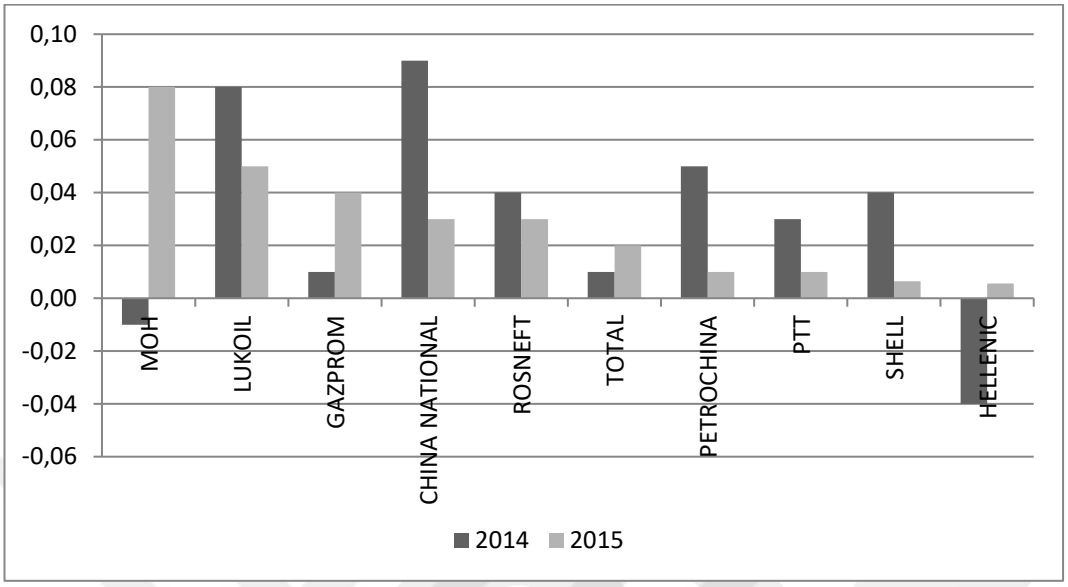

Figure 5.1: Comparative ROA Ratios

2. The companies whose ROAs were positive in 2014 (Lukoil, China National, Rosneft, Petro China, PTT, and Shell) decreased their ROA ratios in 2015 below the level that occurred in 2014. These companies are still profitable but not as much as they were in 2014.

3. The companies whose ROAs were positive in 2014 (Gasprom, Total) increased their ROA ratios in 2015 above the level that occurred in 2014. These companies are more profitable than they were in 2014.

5.1.2. Return on Equity

According to Hazarika (2015), this ratio measures a company's profitability by revealing how much profit a company generates with the money invested by the shareholders. In this context, the following issues are pointed out as seen on **Figure 5.2**:

1. In 2014, 8 companies have positive ROE versus 10 companies have positive ROE in 2015. In parallel to the ROA ratios, this shows that two companies (Motor Oil Hellas and Hellenic Petroleum) experienced a loss in 2014 and they became profitable in 2015.

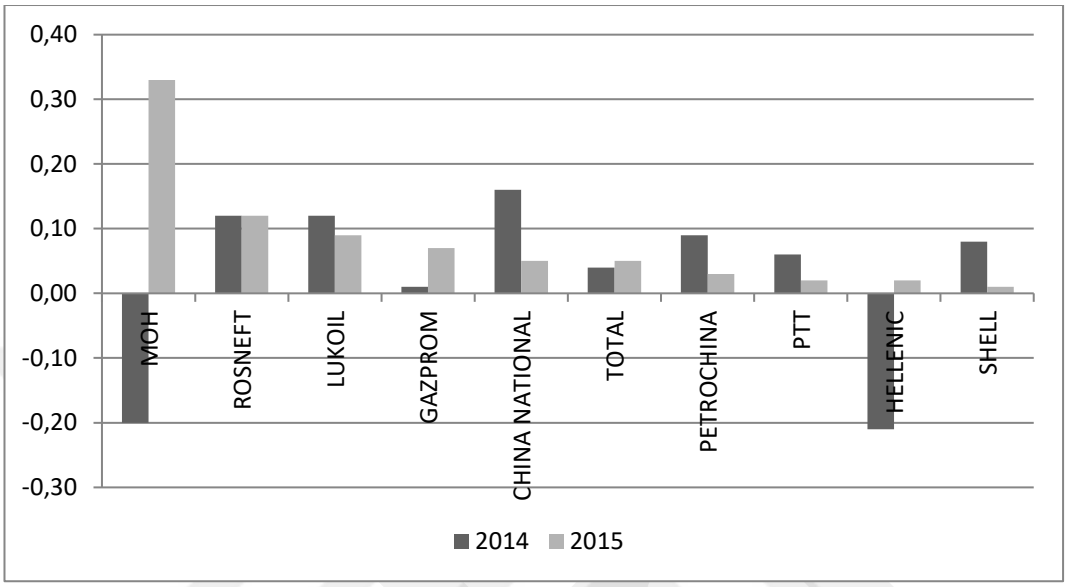

Figure 5.2: Comparative ROE Ratios

2. The companies whose ROEs were positive in 2014 (Lukoil, China National, Petro China, PTT, and Shell) decreased their ROE ratios in 2015 below the level that occurred in 2014 except for the fact that Rosneft's ROE ratio is the same from 2014 to 2015. These companies are still profitable but not as much as they were in 2014 except for Rosneft.

3. The companies whose ROAs were positive in 2014 (Gasprom, Total) increased their ROE ratios in 2015 above the level that occurred in 2014. These companies are more profitable than they were in 2014.

5.1.3. Overall Analysis of Profitability

In terms of profitability analysis supported by ROA and ROE ratios, findings show that Lukoil, China National, Petro China, PTT and Shell are

profitable in 2015 but they are not profitable as much as they were in 2014. Gasprom and Total improved their profitability in 2015 above the level that took place in 2014.

On the other hand, two companies that experienced loss in 2014 (Motor Oil Hellas and Hellenic Petroleum) became profitable in 2015. In this context, the huge improvement of profitability made by Motor Oil Hellas should be particularly taken into account compared to others.

5.2. Liquidity Analysis

In order to evaluate the liquidity structure of an entity, there are mainly two financial ratios: (1) Current ratio, and (2) Quick ratio. Liquidity analysis of these petroleum companies is organised in parallel to the prior research of Jurkowski & Daly (2015) and Hazarika (2015).

5.2.1. Current Ratio

As the primary ratio of liquidity, current ratio provides the users of financial information the opportunity to examine whether the companies meet their short-term obligations with their current assets (Hazarika 2015). It is calculated by dividing current assets by current liabilities. A strong current ratio is assumed to the value 2.

On the other hand, a current ratio under the value of 1 suggests that the company would be unable to pay off its debts if they came due at once (Jurkowski & Daly 2015). Even if this is the case, this situation does not mean that a company with a current ratio under 1 is a company that goes to bankruptcy but it is generally considered a poor sign of financial performance regarding liquidity.

In terms of these petroleum companies, this research points out the following findings regarding current ratio:

1. In 2014, current ratio ranges from 0,67 to 1,86 versus it ranges from 0,74 to 2,15 in 2015 as seen on **Figure 5.3** and **Figure 5.4**.

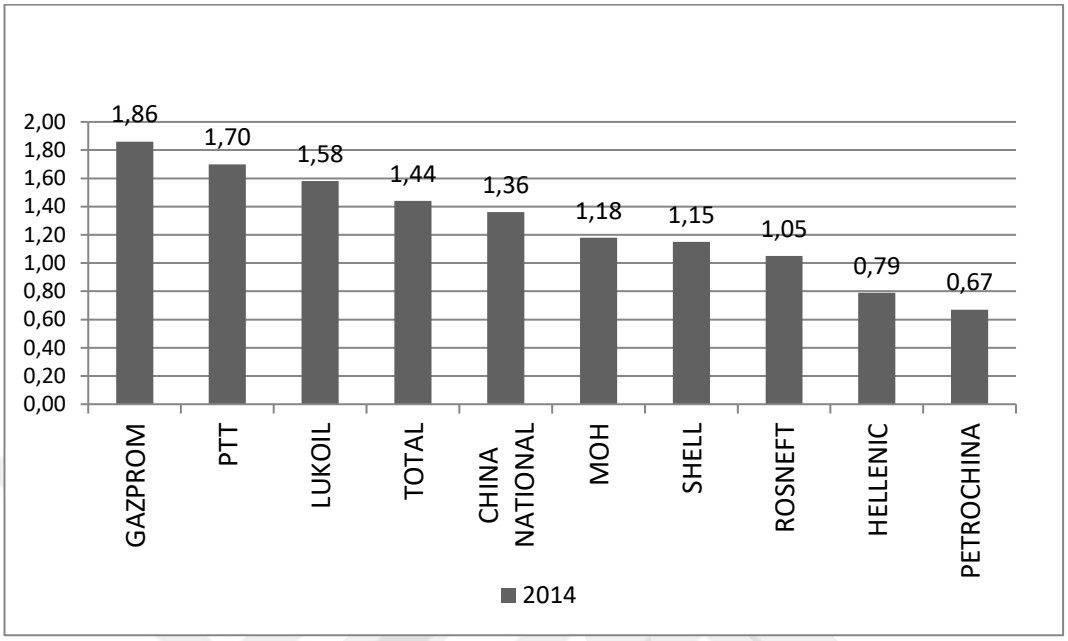

Figure 5.3: Current Ratio for the Year 2014

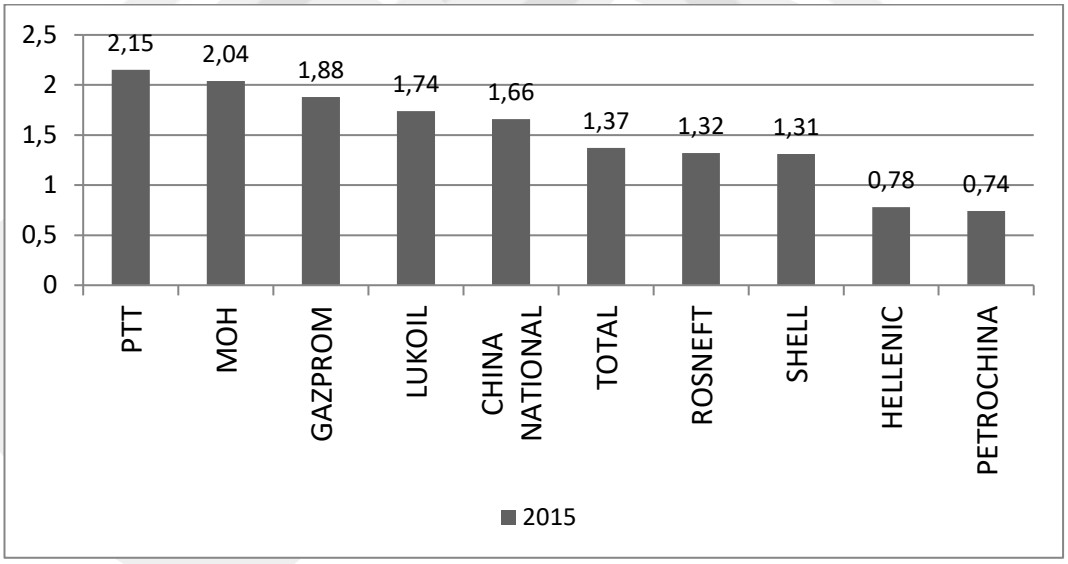

Figure 5.4: Current Ratio for the Year 2015

2. Among the current ratio scores of petroleum companies, there is generally an increasing trend from one year to another as seen on **Figure 5.5**.

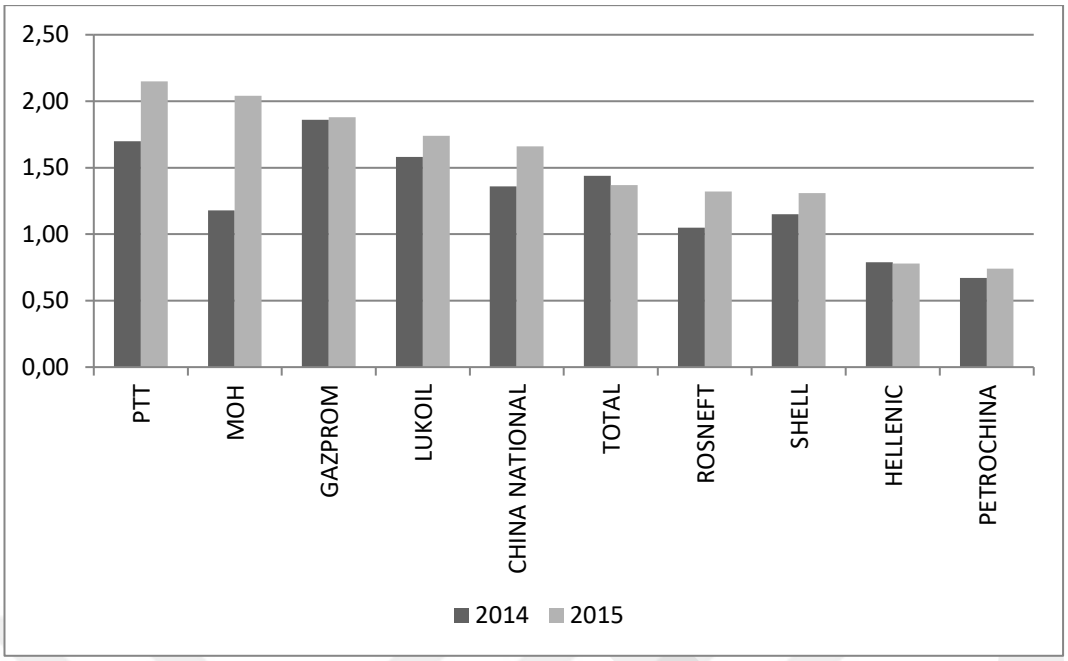

Figure 5.5: Comparative Current Ratios

3. Compared to 2014, PTT and Motor Oil Hellas improved their liquidity above 2 in 2015 as a sign of strong liquidity.

4. Compared to 2014, Gazprom, Lukeoil, and China National increased their liquidity from one year to another. It is not expected that they will experience liquidity problem.

5. Compared to 2014, Total slightly decreased but Rosneft and Sheel improved their liquidity from one year to another. However, the higher the current ratio, the better the liquidity structure. This improvement of liquidity is not enough and does not carry these companies above a current ratio of 1.5. That is why, the amount of net working capital is still closer to a negative amount in the sense that these companies still have the probability of not meeting their current liabilities with their current assets. In order to manage liquidity, quick ratio, receivables collection turnover, and payables turnover should be calculated.

6. Compared to 2014, Hellenic and Petro China still experience liquidity problems. They are not able to meet their current liabilities with their current assets.

5.2.2. Quick Ratio

As the secondary ratio of liquidity, quick ratio provides the users of financial information the opportunity to examine whether the companies meet their short-term obligations with their current assets by removing the effect of inventory items from current assets (Jurkowski & Daly 2015). This ratio helps the users of financial information to understand how strong the financial effect of inventory items over the current assets due to the fact that inventory items are the least liquid asset items within the current assets and they should be sold within one year.

It is calculated by dividing (current assets - inventory) by current liabilities. Quick ratio score is expected to be 1 or above 1 in order to state the companies are not dependent to their inventory items in liquidity management and they are capable to managing their liquidity regardless of the sale of inventory items.

In terms of these companies, this research points out the following findings regarding quick ratio:

1. In 2014, quick ratio ranges from 0,06 to 1,50 versus it ranges from 0,47 to 1,88 in 2015 as seen on **Figure 5.6** and **Figure 5.7**.

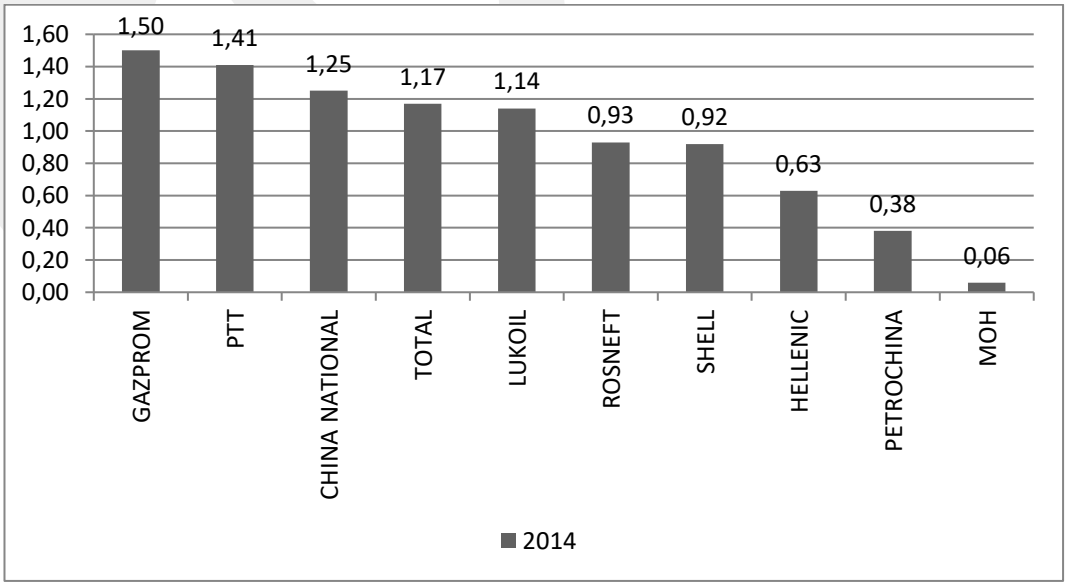

Figure 5.6: Quick Ratio for the Year 2014

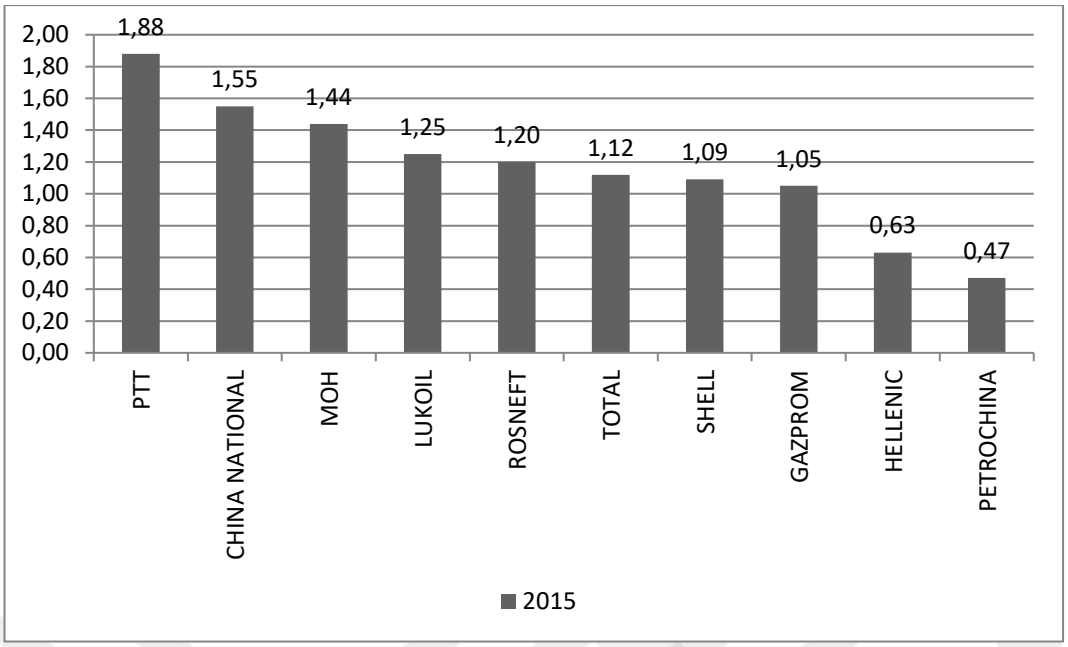

Figure 5.7: Quick Ratio for the Year 2015

2. Among the quick ratio scores of petroleum companies, there is generally an increasing trend from 2014 to 2015 except for the decrease of quick ratio scores of Gasprom and Total companies which are still above 1 as seen on **Figure 5.8**.

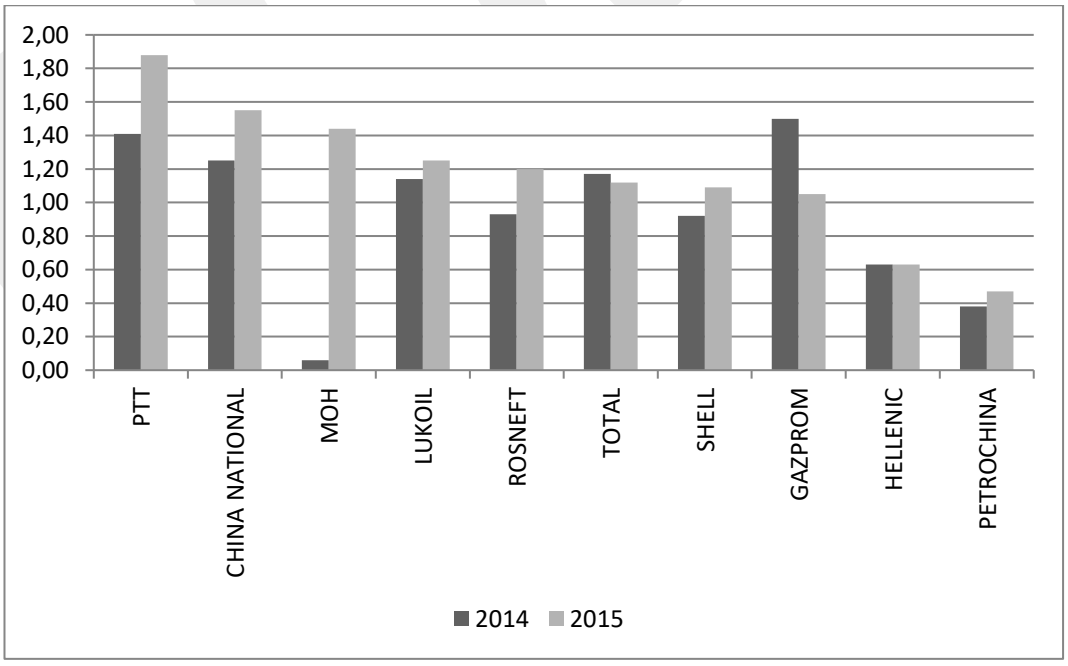

Figure 5.8: Comparative Quick Ratios

3. The most positive change on the liquidity structure was occurred over the financial health of Motor Oil Hellas. This company transferred itself from being an inventory dependent company to being an inventory independent company. However, regarding this change, it should be questioned the reason behind the positive change on quick ratio to make sure whether it is related to slow moving or oversupply of inventory items or whether there was any other related reason from 2014 to 2015.

4. In parallel to the current ratios scores, the quick ratio scores of Hellenic Petroleum and Petro China also verify that these two companies are not able to meet their current liabilities with their current assets. They are inventory dependent. It should be questioned the reason behind this situation regarding these companies.

5. Within the framework of this sector, liquidity problems are not expected depending on the slow moving or oversupply of inventory items because all of them are upstream companies that represent the exploration and exploitation of the oil reservoirs and they sell their explored and exploited oil to downstream companies such as refineries in the global context. That is why, an increasing or decreasing trend over the quick ratio should not be based on slow moving or oversupply of inventory items and there should be other reasons that create pressure over the quick ratio.

5.2.3. Overall Analysis of Liquidity

In terms of liquidity management, this research points out the following overall results for the year 2015.

1. The company that has the strongest liquidity is PTT. This company is capable to managing its short-term liabilities with its current assets.

2. Hellenic Petroleum and Petro China are not able to manage their current liabilities with their current assets.

3. Other companies are generally capable of managing their current liabilities with their current assets but some of them should decrease their current liabilities to have better current and quick ratios.

4. Liquidity analysis of upstream companies requires some reservation in terms of slow moving or oversupply of inventory items regarding quick ratio because upstream companies sell their explored and exploited oil to downstream companies. That is why, it is expected that there should be other reasons behind inventory dependency rather than slow moving or oversupply issues.

5.3. Efficiency Analysis

5.3.1. Receivables Turnover

This ratio shows that how soon the company collects its trade receivables from its customers. There is no certain value on a timely or daily basis. However; higher ratio means faster collection of trade receivables.

1. In 2014, receivables turnover ranges from 5,34 to 43,00 versus it ranges from 5,45 to 33,00 in 2015 as seen on **Figure 5.9** and **Figure 5.10**.

2. This ratio shows a decreasing trend from 2014 to 2015. It means that the collection of trade receivables slowed down from one year to another.

3. Within the framework of the declared range in year 2014, the average collection period covers a period approximately between 8,5 days and 68 days.

4. Within the framework of the declared range in year 2015, the average collection period covers a period approximately between 11 days and 67 days.

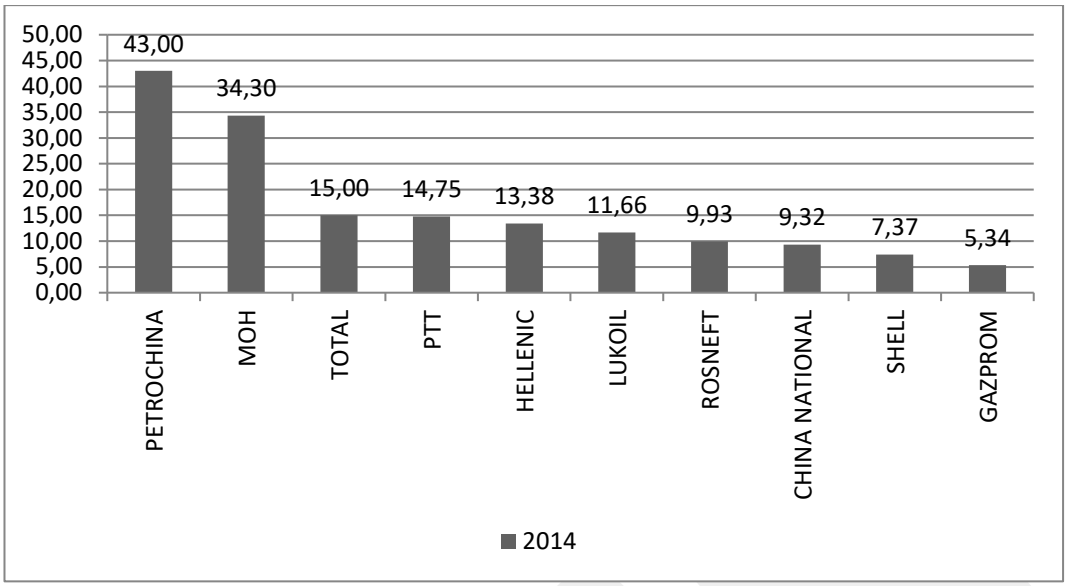

Figure 5.9: Receivables Turnover in 2014

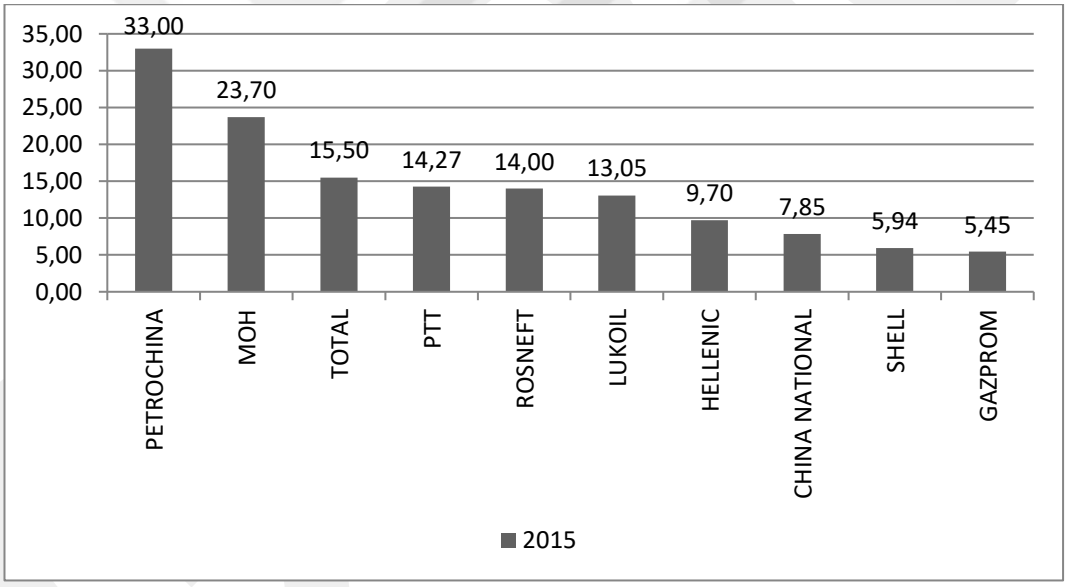

Figure 5.10: Receivables Turnover in 2015

5. This shows that there is no much variation in terms of collection period of trade receivables from one year to another on a company basis as seen on **Figure 5.11**.

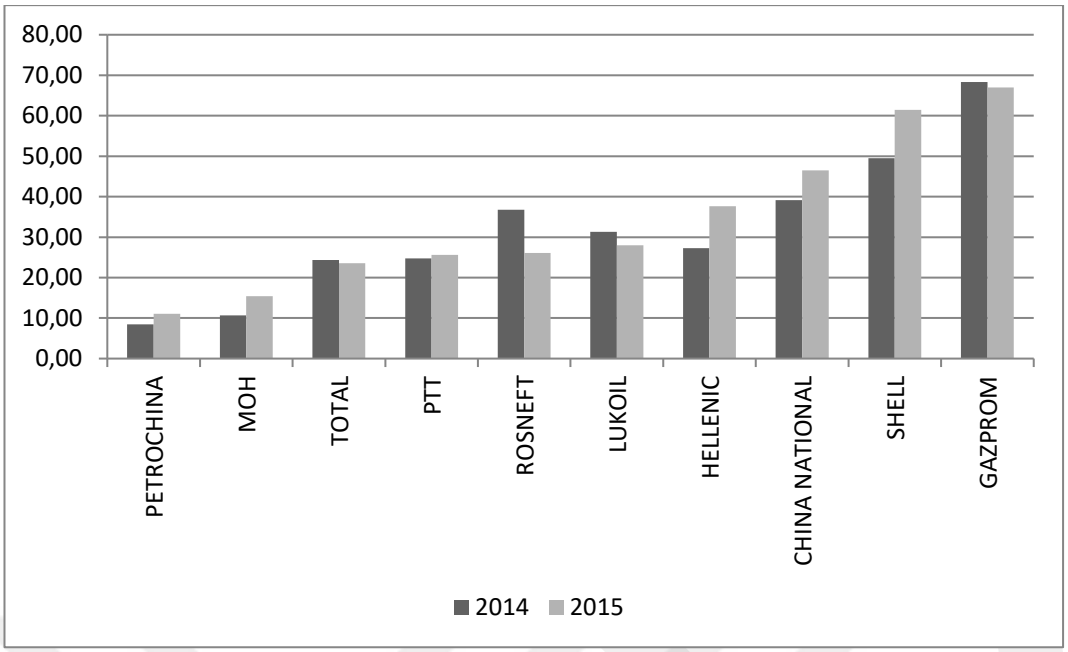

Figure 5.11: Comparative Average Collection Period

5.3.2. Payables Turnover

This ratio shows that how soon the company pays its trade payables to its suppliers. There is no certain value on a timely or daily basis. However; lower ratio means slower payment of trade payables.

1. In 2014, payables turnover ranges from 3,53 to 14,30 versus it ranges from 2,60 to 16,50 in 2015 as seen on **Figure 5.12** and **Figure 5.13**.

2. This ratio shows a decreasing as well as an increasing trend from 2014 to 2015. It means that the payment of trade payables slowed down or accelerated from one year to another depending on the company.

3. Within the framework of the declared range in year 2014, the average payment period covers a period approximately between 29,53 days and 103,40 days.

4. Within the framework of the declared range in year 2015, the average payment period covers a period approximately between 22,12 days and 140,38 days.

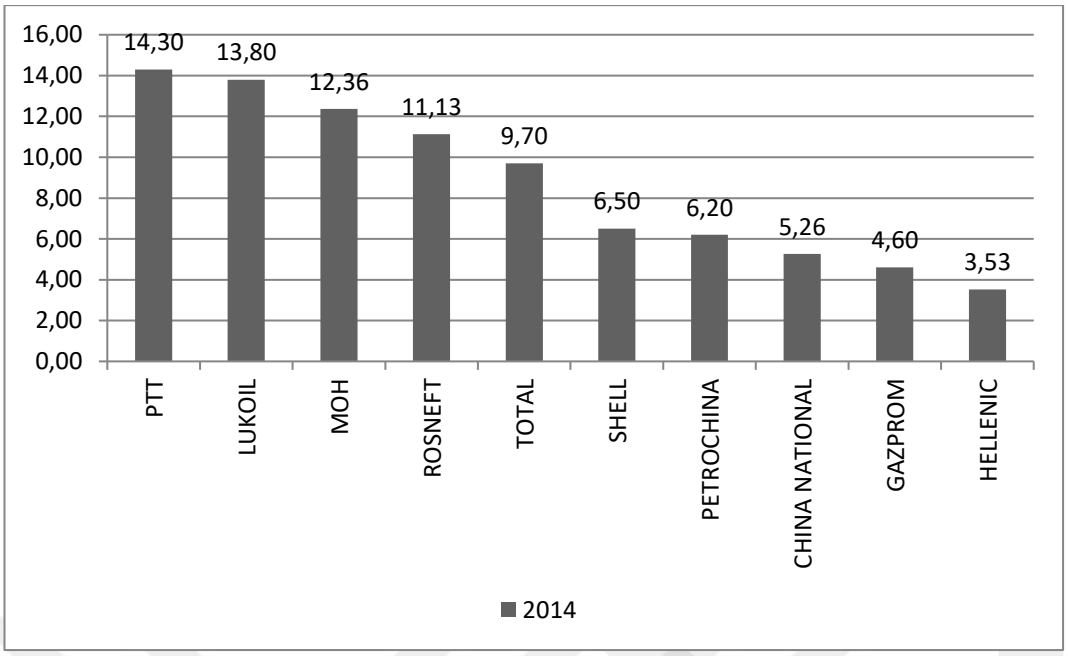

Figure 5.12: Payables Turnover in 2014

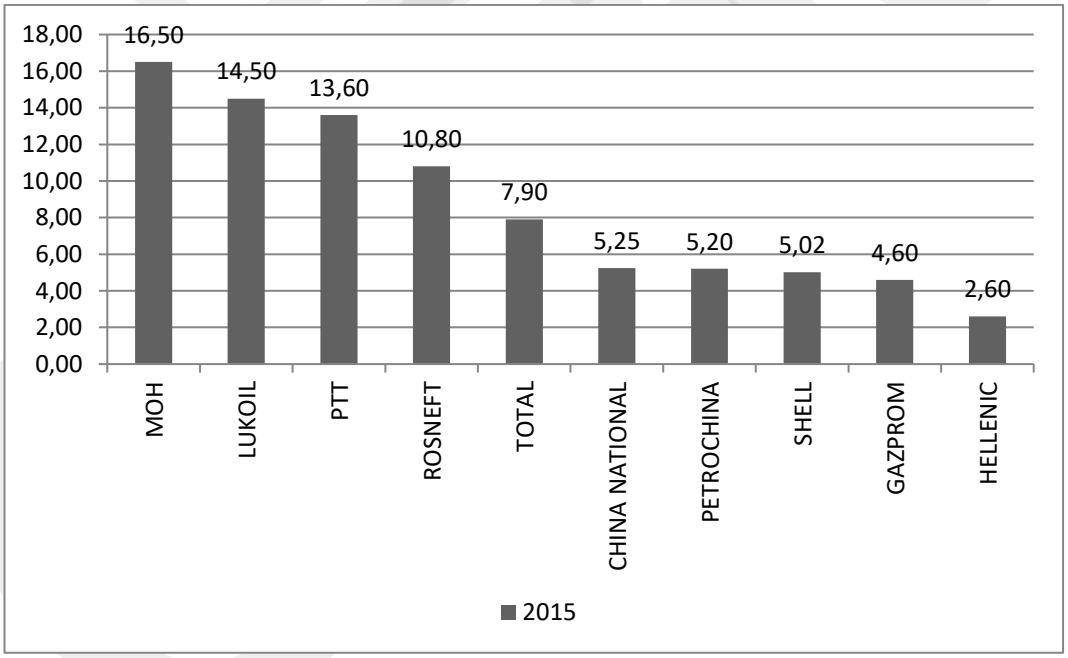

Figure 5.13: Payables Turnover in 2015

5. This shows that some companies (Motor Oil Hellas, Lukeoil) started to pay their trade payables often and some of them (PTT, Rosneft, Total, China National, Petro China, Shell, Gasprom and Hellenic) delayed their trade payables from one year to another on a company basis as seen on **Figure 5.14**.

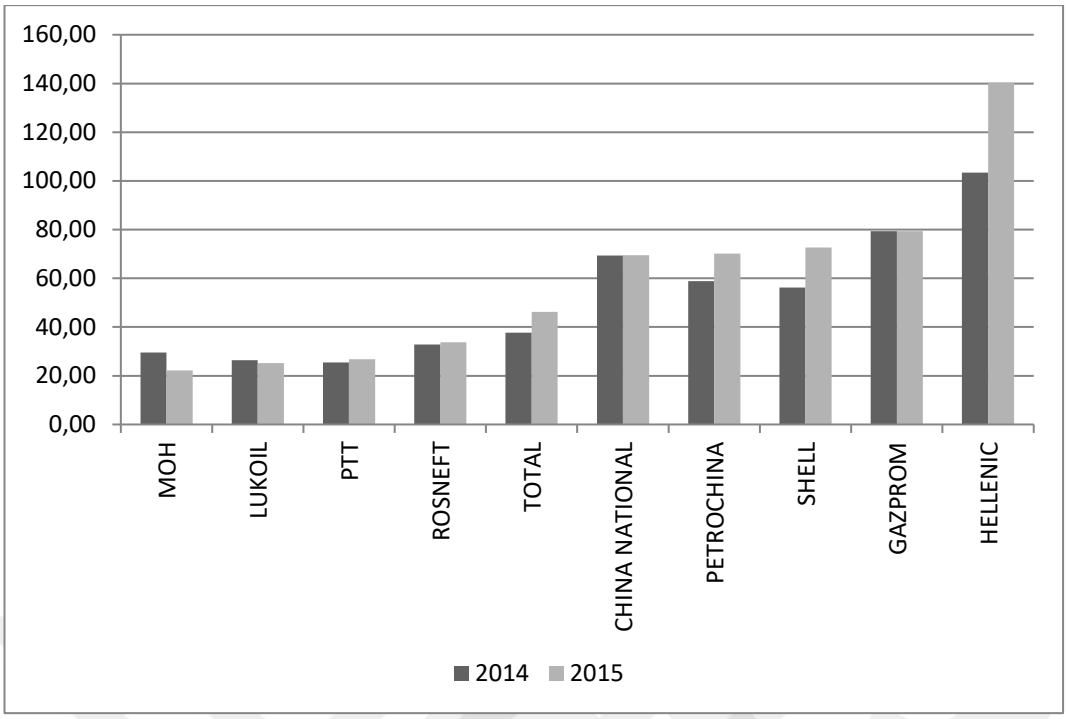

Figure 5.14: Comparative Average Payment Period

5.3.3. Overall Efficiency Analysis

It is known that some companies particularly Hellenic and Petro China experience liquidity problems. Others either do not experience such a problem or in the frontier of such a problem.

1. In terms of all companies, it is observed that they collect trade receivables from their customers faster than making their payments to their suppliers except Lukeoil. It looks like that they are capable of managing the collection and payment period as seen on **Figure 5.15**.

2. Those that are in the frontier of experiencing cash shortage and those that experience cash shortage should be questioned because their possible cash shortage looks like that it is not based on efficiency issues.

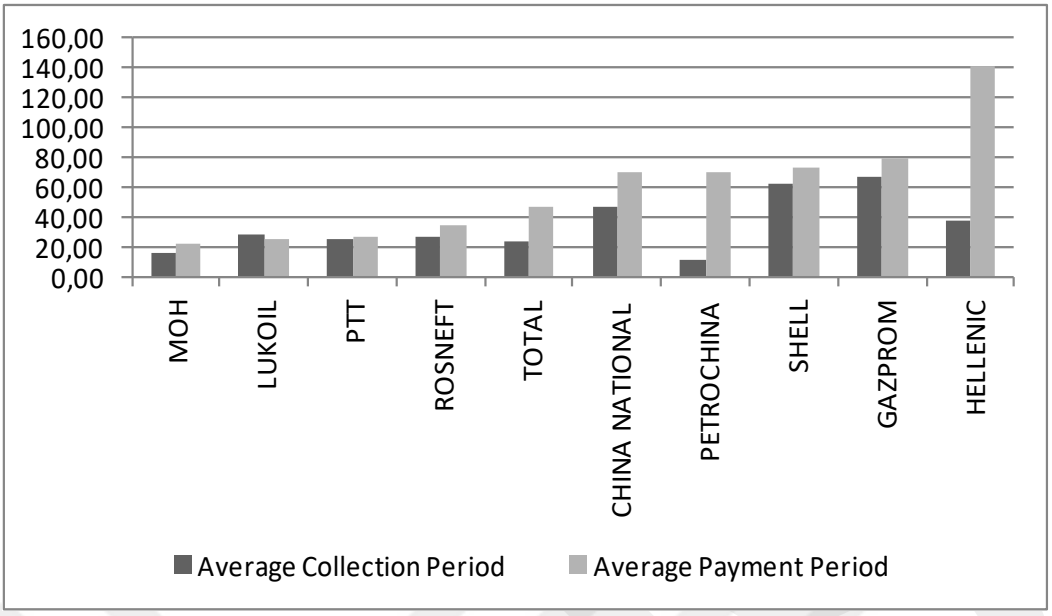

Figure 5.15: Comparative Average Collection and Payment Period in 2015

5.4. Leverage Analysis

5.4.1. Debt/Equity Ratio

One of the important ratios of leverage analysis is debt to equity ratio which indicates the relative proportion of the shareholders' equity and debt (short-term and long-term) used to finance a company's assets. In this research, this ratio is preferred based on the prior research of Jurkowski and Daly (2015) and Hazarika (2015). According to Hazarika (2015), many analysts considers a ratio of 0,30 or lower healthy.

1. In 2014, debt/equity ratio ranges from 0,50 to 4,70 versus it ranges from 0,55 to 3,48 in year 2015 as seen on **Figure 5.16** and **Figure 5.17**.

2. Debt/equity ratio has a decreasing trend for some companies (PTT, Millennium Oil Hellas, Total, Petro China and China National) as seen on **Figure 5.18**. On the other hand, other companies' debt/equity ratios have an increasing trend (Rosneft, Shell, Gasprom, Hellenic Petroleum) except for Lukeoil. Lukeoil has a stable debt/equity ratio from 2014 to 2015.

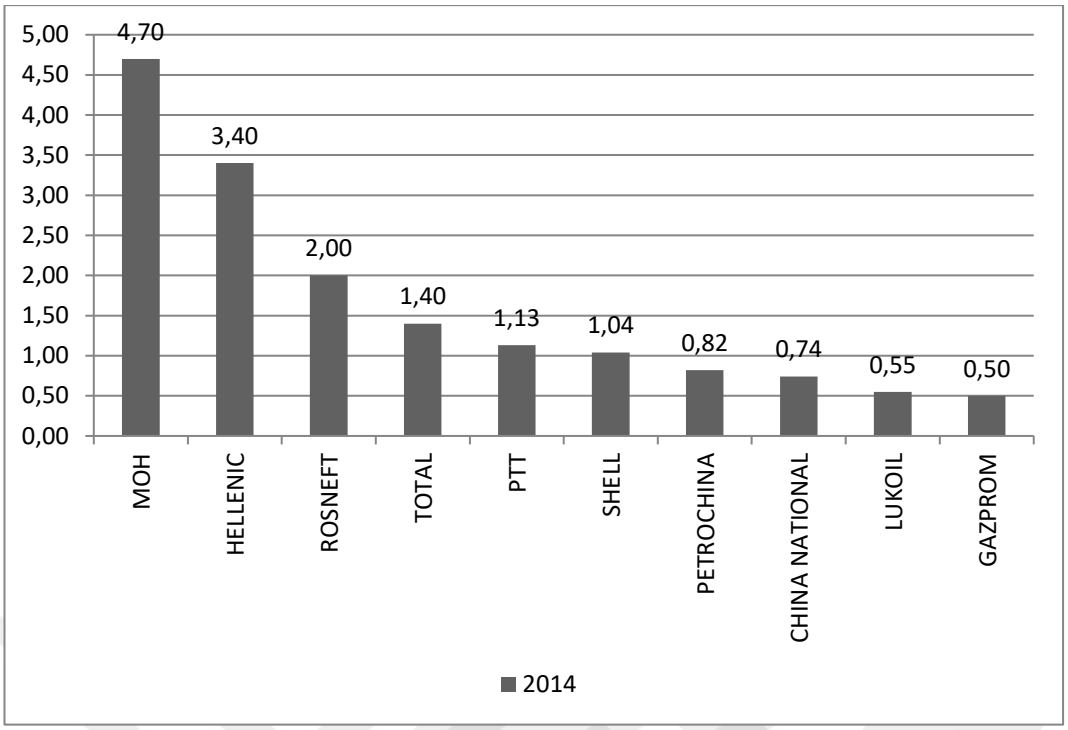

Figure 5.16: Debt/Equity Ratio for the Year 2014

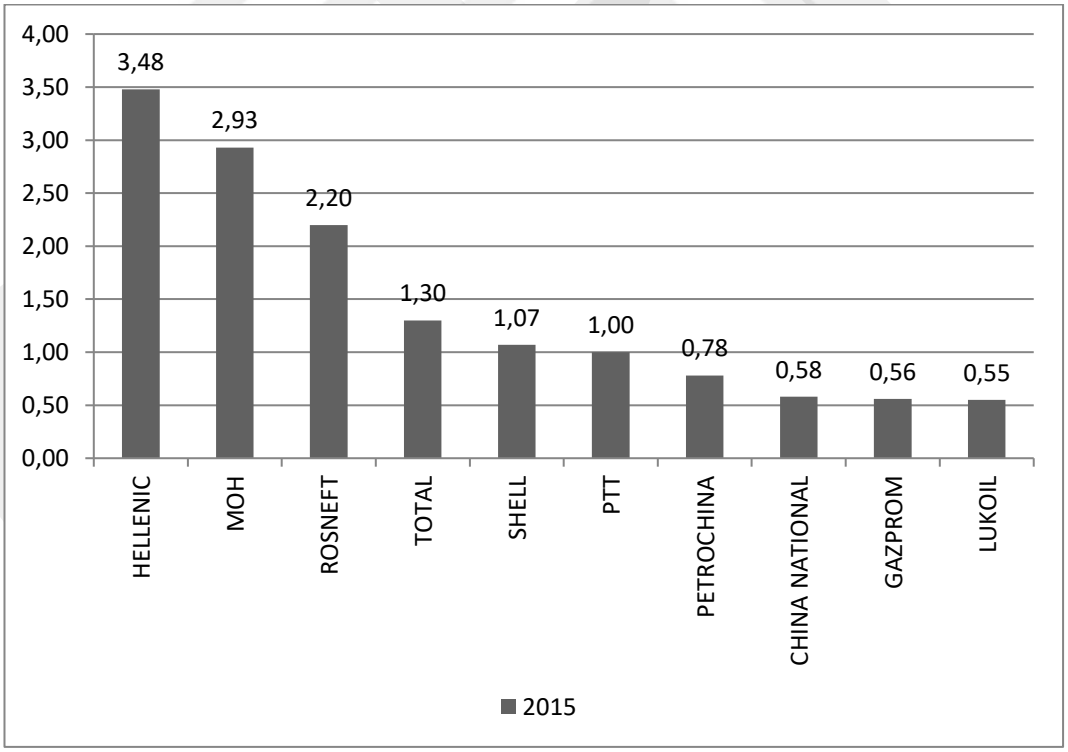

Figure 5.17: Debt/Equity Ratio for the Year 2015

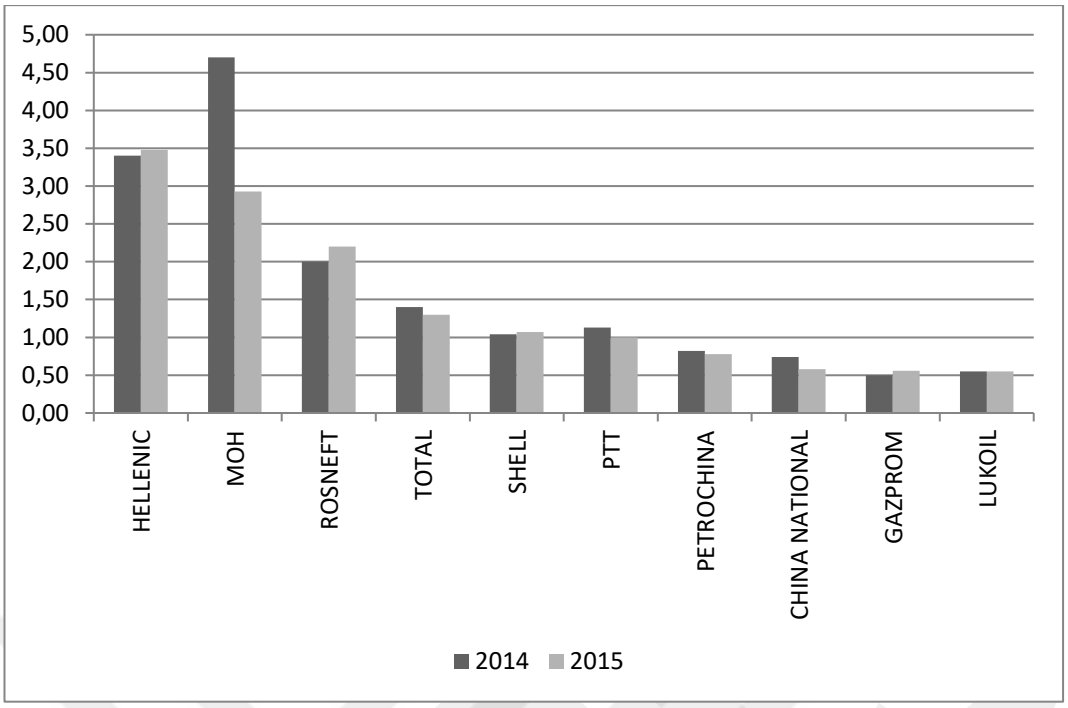

Figure 5.18: Comparative Debt/Equity Ratio

3. Even if debt/equity ratio has an increasing, decreasing or stable trend, it only tells the investor whether the amount of total debt increases, decreases or remain stable. Therefore, it does not give an investor the opportunity to observe the proportion of debt within the short-term or long-term liabilities as well as the opportunity to compare change in short-term or long-term liabilities from one period to another. In this context, what is important for an investor is the short-term portion of total debt which creates a pressure over the liquidity of the company.

4. A debt/equity ratio which has an increasing, decreasing or stable trend from one period to another may mislead an investor about the indebtness of the company. To better understand the debt structure, the weight of short-term liabilities over the total liabilities should be compared from 2014 to 2015 for the purpose of understanding the pressure of debt over the liquidity.

5.4.2. Short-term Liability Analysis

In order to support the debt/equity ratio, the weight of short-term liabilities over total liabilities should be calculated and comparatively observed from 2014 to 2015. The findings supported by the debt/equity ratio are as follows:

1. In 2014, short-term portion of total liabilities ranges from 34% of total debt to 67% of total debt versus it ranges from 27% of total debt to 71% of total debt in 2015 as seen on **Figure 5.19** and **Figure 5.20**.

2. From 2014 to 2015, short-term portion of total debts for some companies (Rosneft, PTT, Gasprom, China National, Lukeoil, Shell, Motor Oil Hellas, Petro China) decreased versus short-term portion of total debts for one company increased (Hellenic) as seen on **Figure 5.21**.

3. From 2014 to 2015, Total kept its short-term portion of total debts as stable (40%).

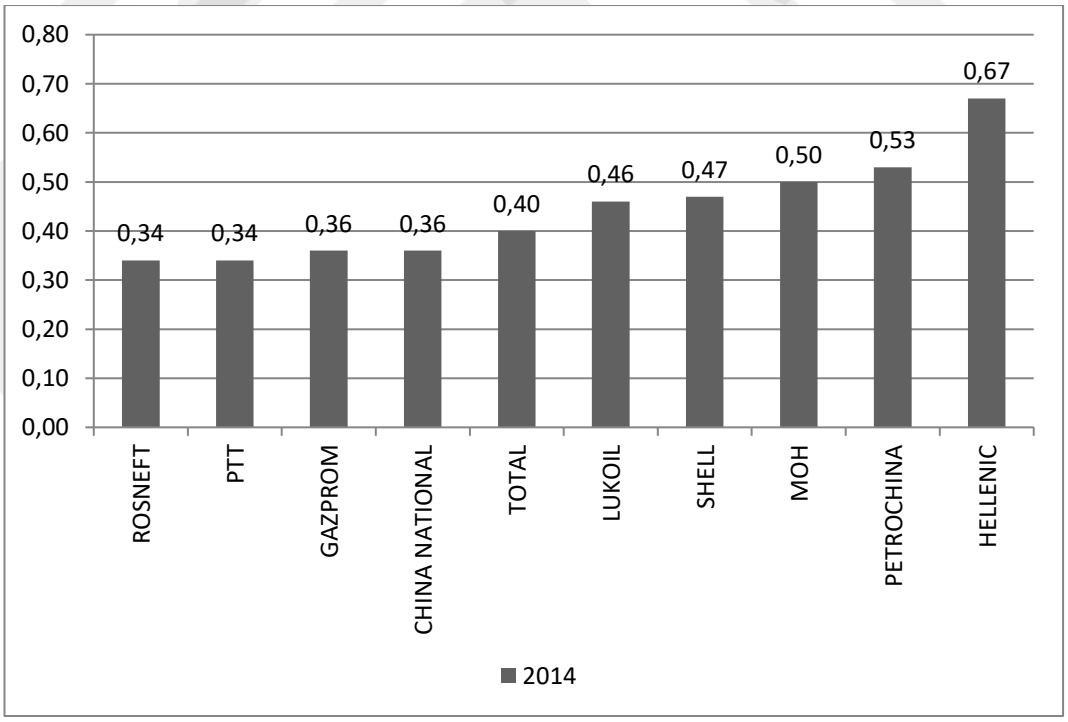

Figure 5.19: Short-Term Portion of Total Debts for the Year 2014

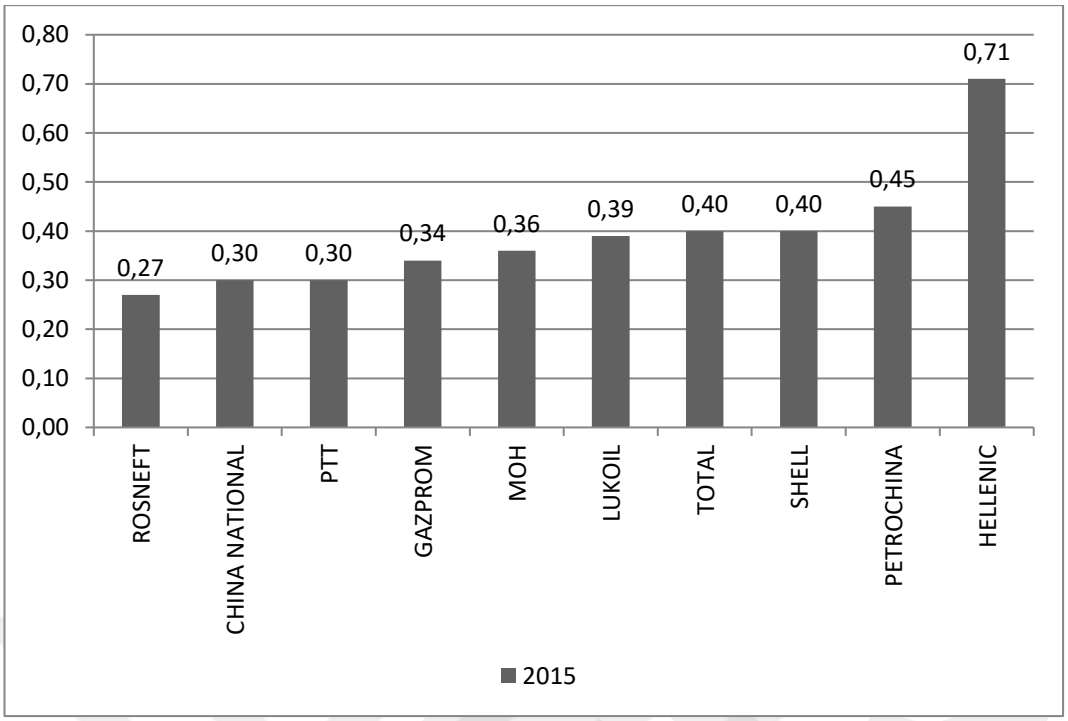

Figure 5.20: Short-Term Portion of Total Debts for the Year 2015

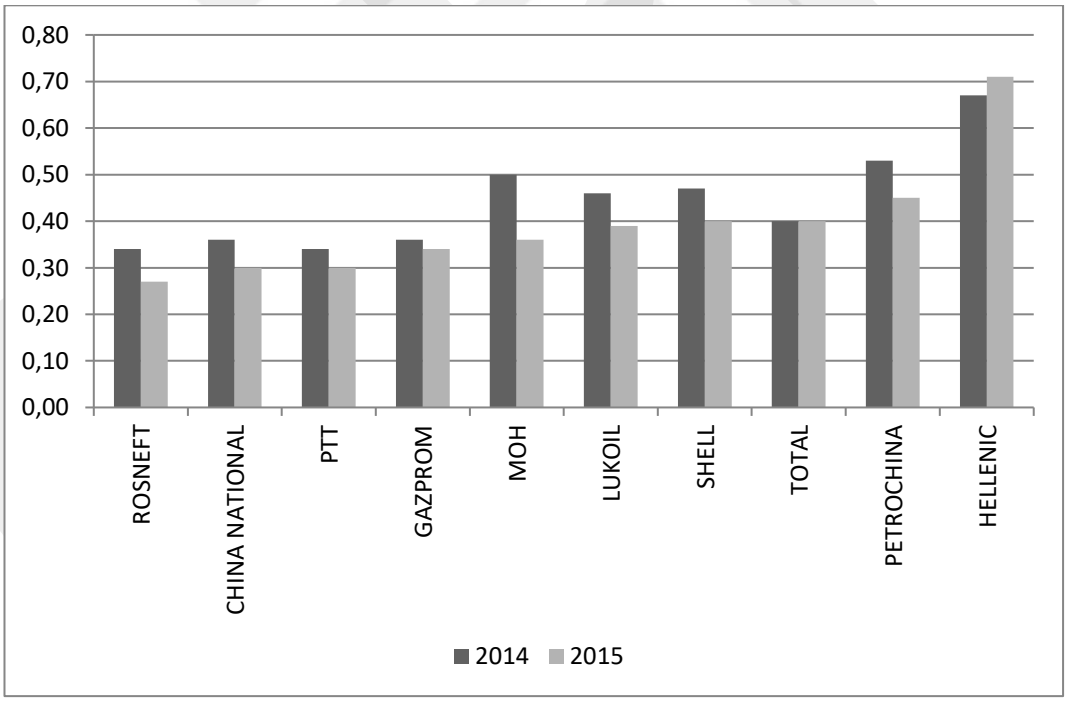

Figure 5.21: Comparative Short-term Portion of Total Debts

5.4.3. Overall Analysis of Leverage

The following issues were pointed out from the leverage analysis:

1. The companies whose debt/equity ratios have a decreasing trend (PTT, Millennium Oil Hellas, Petro China, and China National except for Total) indicate lower proportion of short-term debts over total debts from 2014 to 2015. They have more long-term debts than short-term debts. This situation has positive effect on current ratio.

2. In terms of Total, even if debt/equity ratio slightly decreased from one year to another, the proportion of short-term debts over total debts remains stable. This situation did not make positive contribution to current ratio.

3. The companies whose debt/equity ratios have an increasing trend (Rosneft, Shell, Gasprom except for Hellenic Petroleum) indicate a lower proportion of short-term liabilities over total debt from 2014 to 2015. Decrease in short-term debts has positive effect on the current ratio. This situation also means that these companies borrowed more long-term than short-term.

4. In terms of Hellenic Petroleum, debt/equity ratio increased and this increase was generated from short-term debts from 2014 to 2015. That is why, increase in short-term debts does not contribute positively into the current ratio.

5. Lukeoil has a stable debt/equity ratio from 2014 to 2015 but a lower proportion of short-term debt over total debts from 2014 to 2015. This situation has a positive effect on the current ratio of the firm.

5.5. Overall Financial Performance Analysis

These petroleum companies are profitable but it looks like that their liquidity structures are particularly influenced by their debt/equity structure. Due to the fact that all companies are upstream companies and sell their petroleum

products into refineries, it is not expected that they will be inventory dependent because of slow moving or oversupply of their products. Instead, it is possible to observe that the majority of these companies improved their liquidity within the framework of the decrease in the weight of short-term debt over total debts except for Hellenic Petroleum from 2014 to 2015.

Table 5.1: Comparative Financial Ratios and EPS

	MOH	Lukeoil	Gasprom	China National	Rosneft	Total	Petro China	Shell	Hellenic	PTT
ROA	8%	5%	4%	3%	3%	2%	1%	1%	1%	1%
ROE	33%	9%	7%	5%	12%	5%	3%	1%	2%	2%
Current Ratio	2,04	1,74	1,88	1,66	1,32	1,37	0,74	1,31	0,78	2,15
Quick Ratio	1,44	1,25	1,05	1,55	1,20	1,12	0,47	1,09	0,63	1,88
Receivables Turnover	23,70	13,05	5,45	7,85	14,00	15,50	33,00	5,94	9,70	14,27
Payables Turnover	16,50	14,50	4,60	5,25	10,80	7,90	5,20	5,02	2,60	13,60
Debt/Equity	2,93	0,55	0,56	0,58	2,20	1,30	0,78	1,07	3,48	1,00
ST Portion of Total Debts	0,36	0,39	0,34	0,30	0,27	0,40	0,45	0,40	0,71	0,30
LT Portion of Total Debts	0,64	0,61	0,66	0,70	0,73	0,60	0,55	0,60	0,29	0,70
EPS (National Currency)	€ 1,85	408,36 ₽	34,29 ₽	¥0,45	33,50 ₽	$2,17	¥0,19	$0,31	€ 0,15	฿6,73
EPS ($)	**$2,01**	**$ 5,56**	**$0,47**	**$0,07**	**$0,46**	**$2,17**	**$0,03**	**$0,31**	**$0,16**	**$0,18**

Table 5.2: Ranking Financial Ratios and EPS from the Highest to the Lowest

	ROA	ROE	Current Ratio	Quick Ratio	ART	APT	Debt/Equity	ST Debts/Total	LT Debts/Total	EPS
I	MOH	MOH	PTT	PTT	Petro China	MOH	Hellenic	Hellenic	Rosneft	Lukeoil
II	Lukeoil	Rosneft	MOH	MOH	MOH	Lukeoil	MOH	Petro China	PTT	Total
III	Gasprom	Lukeoil	Gasprom	Gasprom	Total	PTT	Rosneft	Shell	China National	MOH
IV	China National	Gasprom	Lukeoil	Lukeoil	PTT	Rosneft	Total	Total	Gasprom	Gasprom
V	Rosneft	China National	China National	China National	Rosneft	Total	Shell	Lukeoil	MOH	Rosneft
VI	Total	Total	Total	Total	Lukeoil	China National	PTT	MOH	Lukeoil	Shell
VII	Petro China	Petro China	Rosneft	Rosneft	Hellenic	Petro China	Petro China	Gasprom	Total	PTT
VIII	Shell	Hellenic	Shell	Shell	China National	Shell	China National	China National	Shell	Hellenic
IX	PTT	PTT	Hellenic	Hellenic	Shell	Gasprom	Gasprom	PTT	Petro China	China National
X	Hellenic	Shell	Petro China	Petro China	Gasprom	Hellenic	Lukeoil	Rosneft	Hellenic	Petro China

CHAPTER 6

RESEARCH FINDINGS ON PORTFOLIO OPTIMIZATION OF MAJOR UPSTREAM QUOTED IFRS PETROLEUM COMPANIES

This chapter provides research findings about portfolio optimization of major upstream quoted IFRS petroleum companies. It starts with (1) Sample Set and follows the following subsections: (2) Share Price Data Analysis; (3) Observations of Daily Returns; (4) Average Daily Returns and Standard Deviations for Individual Securities; and (5) Different Scenarios for Portfolio Optimization.

6.1. Sample Set

This portfolio optimization is based on major upstream quoted IFRS petroleum companies whose ROA and ROE are positive for the year 2015, whose earnings per share is available and whose number of missing observations is acceptable/tolerable levels. In this context, the sample set is made up of 9 companies: (1) Petro China, (2) Total, (3) Hellenic Petroleum, (4) Motor Oil Hellas, (5) China National Offshore Oil, (6) Rosneft, (7) Gazprom, (8) Lukoil, and (9) Shell.

Compared to the sample of financial performance analysis, PTT was excluded from the sample due to the fact that missing share price observations of PTT follow a pattern of consecutive days such as from January 1, 2015 to January 8, 2015 and from April 13, 2015 to April 15, 2015 within the framework of the official calendar year of the Thailand. That is why this research points out that it is difficult to make missing share price observations of PTT compatible with the share price observations of other companies.

6.2. Share Price Data Analysis

Share price observations of the petroleum companies were collected either from companies' investor relations websites or from other respected financial websites such as Yahoo Finance in a spreadsheet calendar year format. Not all the share price observations were in US Dollars. That is why non-US Dollars share price observations of Hellenic, Motor Oil Hellas, Lukeoil, Gasprom, China National, Rosneft and Petro China were converted into US Dollars so that share prices observations are in common denominator at the foreign currency level.

Share price observations cover the period between January 2, 2015 and December 23, 2015. This period is based on 253 days of share price observations. However, the reason why the period from December 24, 2015 to December 31, 2015 was excluded from the sample should be noted that it is based on the fact that there are lots of numbers of missing share price observations from December 24, 2015 to December 31, 2015 for each company except Shell within the sample to have healthy financial results. These missing share price observations are based on the official calendar year of the countries of the sampled companies.

On the other hand, it should be stated that there are some missing share price observations of sampled companies within the 253 days as well. Even if these missing observations are based on the official calendar year of the countries of the sampled companies, they are not consecutive as it was in the case of PTT. That is why, when the share price observations were organized for each company between January 2, 2015 and December 23, 2015 in a spreadsheet format, missing share price observation on the spreadsheet for a specific date was calculated by taking the growth rate of the two prior days assuming that missing share price will increase at the same growth rate of the two prior days using the following formula.

$$Missing\ Share\ Price = \left(1 + \left(\frac{N_{1\ day}}{N_{0\ day}}\right) - 1\right) \times N_{0\ day}$$

In this context, it was observed that China National Offshore Oil, Gasprom, Total and Petro China have 7, Hellenic Petroleum has 9, Motor Oil Hellas has 12, Rosneft and Lukoil have 4, and Shell has 3 missing non-consecutive observations. Since these missing observations for each specific date were calculated through help of the formula provided above, all share price observations established a common denominator within the framework of the 253 days.

6.3. Observations Of Daily Returns

By taking 253 days observations into account, daily returns of stock share prices from one day to another were calculated using the formula provided below as a change in percentage by formulating on the spreadsheet. This refers to 252 daily return observations.

$$Daily\ Return = 100\ \times \left(\frac{N_{1\ day} - N_{0\ day}}{N_{0\ day}}\right)$$

6.4. Average Daily Returns and Standard Deviations for Individual Securities

Using daily returns of stock share prices as a change in percentage, average daily return (also called expected returns) and standard deviation (risk) of each individual stock of each company are manually calculated using the following formulas (Küçükkocaoğlu, 2002).

$$Average\ Return = E(R_i) = \frac{1}{N}\sum_{t=1}^{N} R_{it}$$

$$Standard\ Deviation = \sigma R_i = \sqrt{\frac{1}{N}\sum_{t=1}^{N}\left(R_{it} - E(R_i)\right)^2}$$

However, in this research, appropriate statistical functions on the spreadsheet applications (AVERAGE and STDEVP) were used and related cells of daily returns of share prices were plugged into these functions and the following results were gathered as seen on **Table 6.1**. Each security's standard deviation indicates that each security is a risky asset at different levels.

Table 6.1: Expected Returns and Standard Deviations for Each Security

	E(Rit)	SD
CHINA NATIONAL	-0,05	2,58
GASPROM	-0,03	2,64
LUKEOIL	-0,03	2,49
ROSNEFT	0,06	2,75
SHELL	-0,12	1,78
TOTAL	-0,39	6,54
PETRO CHINA	-0,15	2,28
HELLENIC	0,04	3,76
MOH	0,18	3,42

6.5. Different Scenarios for Portfolio Analysis

The objective of portfolio management is to allocate the available funds of investors in such a way that it should lead to maximum return and minimum risk (İskenderoğlu & Karadeniz, 2011). However, this situation requires diversification of investments so that exposure to the risk of any particular security is limited (Bodie et al. 2002, 162). In this context, this research focuses on five different scenarios. It establishes a baseline portfolio and four additional portfolios that are based on different constraints.

6.5.1. Baseline Portfolio Scenario

In the baseline portfolio, a potential investor is expected to invest into each stock on an equally weighted basis. Due to fact that there are nine companies in this portfolio, equally weighted scenario refers to an investment of approximately 11% for each security. Sum of the weights are equal to 1. In this context, daily

returns of an equally weighted portfolio based 252 daily return observations are provided on the following graph.

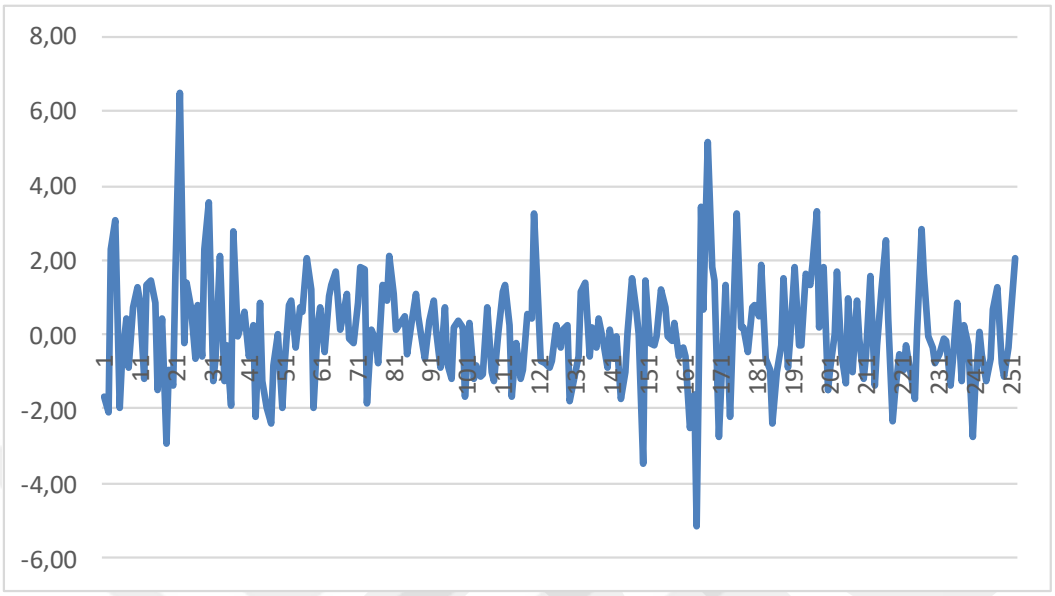

Figure 6.1: Daily Returns on Equally Weighed Portfolio

Expected return of the portfolio is the weighted average of the expected returns of each individual security in the portfolio (Bodie et al. 2002, 163) and is manually calculated using the following formula (Bodie et al. 2002, 227).

$$E(R_p) = \sum_{i=1}^{n} w_i \times E(R_i)$$

However, expected return of the baseline portfolio was calculated using the appropriate statistical function **{=MMULT(TRANSPOSE(averagedaily returns);weights)}** provided in spreadsheet applications by plugging cells related to weights and average daily returns into this function.

On the other hand, standard deviation of a portfolio is manually calculated using the following formula (Bodie et al. 2002, 227).

$$\sigma_p = \sqrt{\sum_{i=1}^{n}\sum_{j=1}^{n} w_i \times w_j \times Cov(ij)}$$

As it seen on the formula, the calculation of the standard deviation requires the calculation of covariance which is a measure of the degree to which returns on two risky assets move in tandem. A positive covariance means that asset returns move together versus a negative covariance means they vary inversely (Bodie et al. 2002, 980).

However, the formula provided above provides the opportunity to calculate the covariance easily for two assets. The calculation for more than two assets is complicated. Since there are 9 securities in this portfolio, a variance/covariance matrix was prepared below using spreadsheet applications under Data Analysis Tool Pack by selecting COVARIANCE to observe the relationship between any of the two assets in a sample of 9 securities as seen on **Table 6.2**.

By using the variance/covariance matrix, standard deviation of the baseline portfolio was calculated using appropriate spreadsheet function **{=SQRT(MMULT(MMULT(TRANSPOSE(weights);variance/covariancematrix);weights))}**. By selecting this function, cells related to weights and variance/covariance matrix were plugged into this function to calculate the standard deviation of the baseline portfolio.

Table 6.2: Variance/Covariance Matrix for the Baseline Portfolio

	CHINA NATIONAL	*GASPROM*	*LUKEOIL*	*ROSNEFT*	*SHELL*	*TOTAL*	*PETRO CHINA*	*HELLENIC*	*MOH*
CHINA NATIONAL	6,61692242	2,638681865	2,680387	3,074129788	2,794423464	3,810179185	4,864279554	0,796743222	1,101833
GASPROM	2,638681865	6,966486347	5,078216	6,219545057	1,947444296	1,518752228	2,114658442	1,091731185	0,877284
LUKEOIL	2,680386601	5,078216187	6,17849	5,678082514	1,907977685	1,747203122	1,998953853	0,629209543	0,6564
ROSNEFT	3,074129788	6,219545057	5,678083	7,522732368	2,153865146	1,760503516	2,359857014	1,473936089	1,068686
SHELL	2,794423464	1,947444296	1,907978	2,153865146	3,147345014	4,419278936	2,038080348	0,740184006	1,486799
TOTAL	3,810179185	1,518752228	1,747203	1,760503516	4,419278936	42,63326061	2,430680387	3,333964618	3,713873
PETRO CHINA	4,864279554	2,114658442	1,998954	2,359857014	2,038080348	2,430680387	5,198583603	0,750295018	0,737635
HELLENIC	0,796743222	1,091731185	0,62921	1,473936089	0,740184006	3,333964618	0,750295018	14,10056931	7,352936
MOH	1,101832773	0,877284323	0,6564	1,068685974	1,486799236	3,713872984	0,737635254	7,352936449	11,66455

Within the framework of these calculations, this portfolio has an expected rate of return of approximately -6% with a standard deviation of 1,87. These results show that potential investor will experience loss from this portfolio. In addition, this investment is even risky without providing any return. It looks like that investing into some of the securities that were placed into this portfolio basket is not feasible to have positive return.

That is why, it is advised that investor should design another portfolio to have positive rate of return with the same standard deviation in the sense of having the same level of risk at most. In order to try other portfolio opportunities, potential investor should invest his/her funds within the framework of the weights calculated by SOLVER function.

6.5.2. Maximum Return Portfolio Scenario 1

In this maximum return portfolio, three assumptions were considered to get the maximum return: (1) It is assumed that a potential investor invests all his/her funds; (2) Standard deviation of the portfolio is less than or equal to the standard deviation of the baseline portfolio which is 1,87; and (3) The weights of each security invested will be equal to or greater than zero.

Within the framework of these assumptions, this portfolio has a maximum expected rate of return of approximately 4% with a standard deviation of 1,87.

In order to receive this rate of return, potential investor should invest his/her funds within the framework of the weights calculated by Solver as seen on **Table 6.3**. It is expected that the shares of Motor Oil Hellas, Rosneft, Shell, China National, and Lukeoil will contribute to this return.

On the other hand, potential investor should not invest to Gasprom, Total and Petro China. Compared to Baseline, it looks like that these companies have positive effect on the expected return without being part of this portfolio.

Table 6.3: Comparative Portfolios (Baseline and Max Return 1)

	BASELINE	MAX RETURN 1
CHINA NATIONAL	0,111	0,120
GASPROM	0,111	0,000
LUKEOIL	0,111	0,072
ROSNEFT	0,111	0,278
SHELL	0,111	0,187
TOTAL	0,111	0,000
PETRO CHINA	0,111	0,000
HELLENIC	0,111	0,034
MOH	0,111	0,309
SUM OF WEIGHTS	1	1
PORTFOLIO RETURN	-0,056	0,043
PORTFOLIO RISK	1,87	1,87

6.5.3. Maximum Return Portfolio Scenario 2

In this maximum return portfolio, there are three assumptions that are taken into account to get the maximum return: (1) It is assumed that a potential investor invests all his/her funds; (2) Standard deviation of the portfolio is less than or equal to the standard deviation of the baseline portfolio which is 1,87; and (3) The weight of each security invested will be at least 5% but will not exceed 25%.

Within the framework of these assumptions, this portfolio has a maximum expected rate of return of approximately 1% with a standard deviation of 1,87. In order to receive this rate of return as seen on **Table 6.4**, potential investor should invest his/her funds particularly into the shares of Motor Oil Hellas, Hellenic, Rosneft, Shell, China National, and Lukeoil that will contribute to this return.

On the other hand, investing into the shares of Gasprom, Total and Petro China lowered expected return compared to the previous maximum return scenario within the framework of the required investment constraint of "investing at least 5% versus at most 25% into all shares". Compared to Max Return scenario 1, it looks

like that Gasprom, Total and Petro China have limited negative effect on the expected return of this second maximum return scenario.

Table 6.4: Comparative Portfolio Analysis (Baseline, Max Return 1 & 2)

	BASELINE	MAX RETURN 1	MAX RETURN 2
CHINA NATIONAL	0,111	0,120	0,094
GASPROM	0,111	0,000	0,050
LUKEOIL	0,111	0,072	0,081
ROSNEFT	0,111	0,278	0,250
SHELL	0,111	0,187	0,108
TOTAL	0,111	0,000	0,050
PETRO CHINA	0,111	0,000	0,050
HELLENIC	0,111	0,034	0,067
MOH	0,111	0,309	0,250
SUM OF WEIGHTS	1	1	1
PORTFOLIO RETURN	-0,056	0,043	0,013
PORTFOLIO RISK	1,87	1,87	1,87

6.5.4. Minimum Risk Portfolio Scenario 1

In this minimum risk portfolio, there are four assumptions that are taken into account to get the minimum risk: (1) It is assumed that a potential investor invests all his/her funds; (2) Expected return of the portfolio will be greater than or equal to zero; (3) The weight of each security invested will be at least 5% but will not exceed 25%; and (4) Standard deviation will be less than or equal to the standard deviation of the baseline portfolio which is 1,87.

Within the framework of these assumptions, this portfolio has an expected rate of return of zero % with a standard deviation of 1,81 as see on **Table 6.5**. In this portfolio, the objective was to decrease the risk below the level of the risk of the baseline portfolio. It looks like that the lowest possible risk is 1,81 because risky shares of Gasprom, Total and Petro China are part of the portfolio due to the required investment constraint of "investing at least 5% versus at most 25% into all shares".

Table 6.5: Comparative Portfolio Analysis (Baseline & Min Risk 1)

	BASELINE	MIN RISK 1
CHINA NATIONAL	0,111	0,066
GASPROM	0,111	0,050
LUKEOIL	0,111	0,095
ROSNEFT	0,111	0,195
SHELL	0,111	0,194
TOTAL	0,111	0,050
PETRO CHINA	0,111	0,050
HELLENIC	0,111	0,050
MOH	0,111	0,250
SUM OF WEIGHTS	1	1
PORTFOLIO RETURN	-0,056	0,000
PORTFOLIO RISK	1,87	1,81

6.5.5. Minimum Risk Portfolio Scenario 2

In this minimum risk portfolio, four assumptions were taken into account to get the minimum risk: (1) It is assumed that a potential investor invests all his/her funds; (2) Standard deviation of the portfolio is less than or equal to the standard deviation of the baseline portfolio which is 1,87; (3) Expected return of the portfolio will be greater than or equal to zero; and (4) The weight of each security invested will be greater than or equal to zero.

Within the framework of these assumptions, this portfolio has an expected rate of return of zero % with a standard deviation of 1,71. In this portfolio, the objective was to decrease the risk below the level of the risk of the baseline portfolio by investing into all shares without any weight constraint. Solver excluded Total and Gasprom shares from the portfolio to lower the risk as seen on **Table 6.6**. For instance, Gasprom and Lukeoil have the same amount negative expected return but Gasprom's risk is higher than risk of Lukeoil. In this context, Solver included Lukeoil into the portfolio as a low risky security compared to Gasprom. In addition, Total has the highest risk in the portfolio with a negative return. That is why, it was excluded.

Table 6.6: Comparative Portfolio Analysis (Baseline, Min Risk 1 & 2)

	BASELINE	MIN RISK 1	MIN RISK 2
CHINA NATIONAL	0,111	0,066	0,038
GASPROM	0,111	0,050	0,000
LUKEOIL	0,111	0,095	0,126
ROSNEFT	0,111	0,195	0,170
SHELL	0,111	0,194	0,306
TOTAL	0,111	0,050	0,000
PETRO CHINA	0,111	0,050	0,074
HELLENIC	0,111	0,050	0,054
MOH	0,111	0,250	0,234
SUM OF WEIGHTS	1	1	1
PORTFOLIO RETURN	-0,056	0,000	0,000
PORTFOLIO RISK	1,87	1,81	1,71

6.5.6. Overall Analysis of Portfolio Scenarios

In contrary to the paper of Jurkowsky and Daly (2015), in order to possibly gain from publicly held shares, different portfolio scenarios should be established with a focus on return maximization and risk minimization by taking investor's preference and risk tolerance into account. This is possible when the selection of shares invested is diversified. In addition, financial ratios and different portfolio scenarios should support each other in decision making.

In the context of the major upstream quoted IFRS petroleum companies, this research examined different scenarios and pointed out the following issues.

(1) The baseline portfolio indicates that investing into the shares of petroleum companies on an equally weighted basis leads to loss from the shares as well as this portfolio is risky without any gain. This portfolio is not favorable.

(2) Maximum return portfolio 1 indicates that investing into shares of petroleum companies on a non-equally weighted scenario with the same standard deviation of the baseline portfolio leads to maximum gain from the shares. For this purpose, the shares of Gasprom, Total and Petro China were excluded from the

portfolio due to their negative returns with high standard deviations. This portfolio is favorable.

(3) Maximum return portfolio 2 indicates that investing into shares of petroleum companies at least 5% and at most 25% with the same standard deviation of the baseline portfolio leads to a positive return between the return of the baseline and maximum return portfolio 1. This weight constraint creates pressure over the positive return and lowers the return compared to the return of maximum return portfolio 1 because Gasprom, Total and Petro China were included into the portfolio in this case.

(4) Minimum risk portfolio 1 indicates that investing into shares of petroleum companies at least 5% and at most 25% leads a limited decrease over the standard deviation of the portfolio because risky shares of Gasprom, Total and Petro China are part of the portfolio.

(5) Minimum risk portfolio 2 indicates that investing into shares of petroleum companies without any weight constraint leads to the maximum decrease in risk over the standard deviation of the portfolio because the riskiest shares of Gasprom and Total were excluded from the portfolio to decrease the risk into its minimum possible level.

CHAPTER 7

CONCLUSION & RECOMMENDATIONS

This thesis focuses on some observations regarding financial reporting, financial performance, and portfolio optimization of major upstream IFRS petroleum companies. The main sample of this research consists of petroleum companies that were ranked according to the sales revenue from highest to lowest in the Wikipedia list of the year 2015. By considering upstream, midstream and downstream activities of petroleum companies, this sample was narrowed to upstream petroleum companies due to the fact that their operations consist of the integral part of the petroleum industry.

In terms of financial reporting, this research pointed out that (1) 76% of the major upstream petroleum companies prepare their annual reports in accordance with IFRS; (2) diversification of IFRS accounting policy choices among major upstream IFRS petroleum companies exists at different levels regarding IAS 1, IAS 2, IAS 7, IAS 16, IAS 38, IAS 40, and IFRS 6; (3) even if IFRS 6 does not regulate accounting policy choices in the context of petroleum accounting, it looks like that the majority of the major IFRS petroleum companies are inclined to prefer SEM rather than FCM in line with the prior research.

In terms of financial performance analysis, this research considered major upstream quoted IFRS petroleum companies whose 2015 ROA and ROE are positive and whose earnings per share data is available. Liquidity, leverage, profitability, and efficiency of these companies were examined through financial ratios and bar charts. Generally speaking, it is not expected that major upstream petroleum companies will experience liquidity problems based on petroleum-based inventory items because these companies sell their products to refineries. However, it looks like that the weight of short-term debts over total liabilities may create cash shortage in these companies.

In terms of portfolio optimization, this research took into account major upstream quoted IFRS petroleum companies whose 2015 ROA and ROE are positive and whose earnings per share data is available as well as whose missing share price observations at acceptable/tolerable levels. According to the prior research of Jurkowski and Daly (2015), investor's preference and risk tolerance in investing into shares of petroleum companies is based on financial ratio analysis and particularly profitability analysis. However, this should not be the only case and different portfolio scenarios should be observed for the purpose of optimal investment opportunity regarding risk minimization and return maximization to support ratio analysis. That is why, this research evaluated five different portfolio scenarios at different risk and return levels in contrast to prior research.

Overall, this research has three recommendations: (1) Diversification of GAAP and accounting policy choices in IFRS based financial reporting among petroleum companies should be minimized; (2) Short-term debt financing should be under control; (3) Financial ratios supported by portfolio optimization should be a reasonable solution to find out the favorable investment opportunity among petroleum companies by meeting reasonable information needs on investor's preference and risk tolerance.

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